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# Access to and Utilization of Health Services in Rural Bangladesh

A Gender Perspective

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# Abstract

Variations in utilization rates of health services between different groups in society indicate inequity in access to these services. Such inequities originate from observable access barriers such as distance and price, as well as from more subtle, cultural barriers such as lack of female autonomy and control over household resources.

With focus on gender inequality, and with Bangladesh as a case study, this thesis uses cross-sectional data to determine which factors that affect health service utilization. Moreover, arsenicosis (chronic arsenic poisoning) is used as a tracer disease, both in a qualitative study of access barriers and for a brief discussion of the utilization of satellite clinics as a means to overcome these barriers.

The results indicate that when ill, women are as much as 50 percent less likely than their male counterparts to utilize health care. Poverty, literacy and access variables are also shown to be important determinants of health care use. Poverty, distance, quality of care, lack of knowledge and education, as well as community and cultural preferences were in Focus Group Discussions (FGDs) identified as barriers to accessing care for arsenicosis patients.

*Key words:* health, health care utilization, gender, Bangladesh, access barriers

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# List of Abbreviations

AAN	Asia Arsenic Network
BHW	Bangladesh Health Watch
DSS	Demographic Surveillance System
FGD	Focus Group Discussion
ICDDR,B	International Centre for Diarrhoeal Disease Research, Bangladesh
MDGs	Millennium Development Goals
MHSS	Matlab Health and Socioeconomic Survey
MOHFW	Ministry of Health and Family Welfare
NGO	Non Governmental Organization
OLS	Ordinary Least Squares
OTC	Over-the-Counter
UNICEF	United Nations Children's Fund
WHO	World Health Organization

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# 1 Introduction

Equitable access to basic health care is a goal in itself; health is a fundamental human right and most governments in the world agree to provide health care systems that enable equal access to care for all citizens. Bangladesh, the country in focus in this study, is no exception. The National Health Policy of the country states that “every citizen has the basic right to adequate health care” (Ministry of Health and Family Welfare (MHFW), Government of Bangladesh).

Except for being a goal in its own right, universal access to health care also has an underlying development objective. The linkages between health, poverty reduction and economic growth are powerful and well recognized (World Health Organization (WHO) 2001; Bloom et al. 2001). Health affects economic growth both directly and indirectly through various paths. A healthy population is more productive and has an increased capacity of learning, which affects both the productivity level in the country and the level of human capital (Hjortsberg 2004). Moreover, disease itself can hinder whole regions from economic and social development, with the AIDS pandemic in Sub-Saharan Africa being the most striking example. Catastrophic expenditures of health care as well as loss of income due to illness are other threats to the world’s poor populations (Ekman 2007). Therefore, investing in equitable provision of health care is an important component of any comprehensive development strategy.

Despite this, health systems in Bangladesh, as well as in many other parts of the world, are ineffective in providing all citizens with health care, which results in inequalities in health and health care utilization between different groups in society (Vaughan et al. 2000; Ahmed et al. 2000). This study attempts to determine which factors affect health service access and utilization among the rural poor in Bangladesh.

Previous research indicates that investing in supply-increasing interventions such as expanded service delivery does not necessarily increase *use* of services (Hjortsberg 2003; Thaddeus and Maine 1994; Ahmed et al. 2000). Instead, it is suggested that policies aiming at increasing access and utilization should take on both a supply- and demand side approach. Empirical research shows that when ill, a variety of factors influence whether the individual seeks health care or not. These factors include socio-economic status, cultural beliefs,



geographical accessibility, disease pattern, etc. (Shaikh and Hatcher 2004; Ahmed et al. 2000; Ahmed et al. 2006). Moreover, a growing body of literature suggests that women face higher access barriers to health care than men in developing countries, due to their lower status in society (Kutzin 1993; Okojie 1994; Vlassoff 1994). Quantitative empirical evidence of such a gender<sup>1</sup> bias in health service utilization is however scarce, since few econometrical studies have addressed this issue. The evidence that does exist is somewhat contradicting. In a well-cited study from Bangladesh, Ahmed et al. (2000) found that when ill, male individuals were over 70 percent more likely to seek care than their female counterparts, all else equal. However, in another study from Bangladesh, Ahmed et al (2005) found that females sought less care than males, but when controlling for poverty status, this difference disappeared. Hjortsberg (2003) found no significant gender impact on either the decision to seek care or on the magnitude of expenditures in Zambia, and neither did Jowett et al. (2004) in a study from Vietnam. More research on this subject is therefore clearly needed.

In the Bangladeshi society, poor women are the most disfavoured group since they not only lack purchasing power, but are due to patriarchal structures of society also neglected to fully participate in social and economic activities (Vlasstoff 1994; Kutzin 1993). This is likely to exclude them from the consumption of essential goods and services, including health care.

The decision to seek care in Bangladesh also incorporates the decision of *what kind* of care to utilize. The myriad of available health care options includes not only formal governmental providers but also village doctors, who often do not have any formal training, as well as traditional faith-healers (Ahmed et al. 2000). This diversity of the health care sector should also be taken into account when studying the decision-making process of health service utilization.

In this thesis, economic theory is tied to econometric methods in order to identify the determinants of health service utilization of the rural population of Bangladesh, and to explore whether any gender differences exists. Logistic regression is used to analyze individual and household data, collected from the Matlab region of rural Bangladesh. The data comes from the Matlab Health and Socioeconomic Survey (MHSS), and is provided by the RAND Corporation. This data was collected in 1996, which makes it appropriate to question if it is still relevant to use in research. However, since life and living conditions have changed only marginally in rural Bangladesh during the last 15 years, the data is deemed to still be usable.

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<sup>1</sup> Gender is the socio-culturally constructed role of men and women, in contrast to sex, which refers to biological

Moreover, in this thesis a specific disease, namely arsenicosis, or arsenic poisoning, is used as a tracer condition for a qualitative study. Arsenic contamination of tube-well water, which is the primary source of drinking water in Bangladesh, has emerged as an acute public health hazard (Vaughan 2000; Smith et al. 2000). Due to poor reporting, the prevalence of illness is unclear, but the WHO has estimated the number of Bangladeshis that are now suffering from arsenic-related diseases to be roughly 5 million. In 2000, the WHO stated that of the 125 million inhabitants in Bangladesh, between 35 million and 75 million were at risk of drinking arsenic-contaminated water (Smith et al. 2000).

The characteristics of arsenicosis and the circumstances in which it exists, makes it well suited as a tracer disease for this thesis. Apart from being a human catastrophe, the disease burden is especially harmful for the rural poor, since it threatens them to fall deeper into poverty (Chowdhury et al. 2006). Furthermore, in a country where the health care system is ineffective and exclusive by nature, inequity in access to care is a fact. Moreover, a stigmatising effect of the disease, especially among women, has been reported in earlier research (Paul and Brock 2006; Sarker 2010, Sultana 2006). This is likely to delay or impede female patients' health seeking behaviour.

While most research and policy measures that concern arsenic mitigation aim at the provision of safe water, little attention has been put on access to health care for arsenic victims. With the help of a qualitative field study conducted during five weeks in April and May 2011, this thesis attempts to identify barriers to health service utilization for arsenicosis patients. Qualitative data of community attitudes towards health service use was collected at three rural sites through focus group discussions (FGDs) and individual interviews. Relevant information was also collected from non-governmental organizations (NGOs) involved in arsenic mitigation programmes, as well as international organizations engaged in research and policy support.

Regarding the provision of health care for arsenicosis patients, an interesting pilot project which uses satellite clinics, is currently running in Bangladesh. In light of the FGDs, a discussion about providing satellite clinics as a possibility to overcome some of the access barriers will be carried out.

This thesis contributes to research within the field of health economics in various ways. First of all, few earlier studies of health care in the developing world have focused on

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differences

women, and the ones that do, almost exclusively focus on maternal health services (see e.g. Abbas and Walker 1986; Thaddeus and Maine 1994; Woldemicael and Tenkorang 2010). However, these studies can not address the issue of a male-female bias of utilization, since they focus on a type of health care which only concerns women. An additional contribution of this thesis is that it uses both quantitative and qualitative research approaches, which allows for the verification of findings from the econometric analysis with empirical findings from FGDs. This complements and enriches the analysis. While quantitative methods can identify gaps between e.g. health knowledge and health behaviour, only qualitative methods, such as focus group discussions, can actually fill these gaps and explain why they occur (Kitzinger 1995).

## 1.1 Objectives

Using Bangladesh as a case study, this thesis aims at exploring access to and utilization of health care in rural areas in a development context, with special reference to gender. Specifically, the study aims at (1) exploring whether there are any gender differences in the factors which are affecting health care utilization in general of the rural population in Bangladesh (2) exploring the health-seeking behaviour and barriers to access among arsenicosis patients in particular, again with a focus on gender (3) briefly discuss the characteristics of satellite clinics as a possible means of overcoming access barriers for arsenicosis patients (and in the long run for other types of patients).

## 1.2 Disposition

The rest of this thesis is structured as follows. Chapter 2 gives a theoretical background and presents the findings of previous studies. In Chapter 3, the health situation and health care system in Bangladesh is presented. Then follow the empirical findings, which are divided into two different sections. Section I (Chapters 4-6) consists of the econometrical study of health service utilization in general, while Section II (Chapters 7 and 8) presents the findings from the qualitative study of health care access for arsenicosis patients and a discussion about satellite clinics. Chapter 9 concludes the thesis with a discussion on the results and policy implications.

## 2 Health Service Utilization –Theory and Empirics

Studies on utilisation of health services fall under a mixed demand-supply framework. On the supply side, good quality care may not be offered. On the demand side, despite offered, individuals may not utilize the care which is provided to them and which they would likely benefit from (O'Donnell 2007). These two sides obviously interact, and there is not always a straightforward distinction between demand and supply side components. For example, if the quality of health care is poor, the public will have little interest in utilizing it, which implies low demand.

In this chapter, we highlight the most important factors determining health service utilization within the context of an economic framework of the demand for health care. These are illustrated by evidence in a variety of mainly low- and middle-income countries.

### 2.1 The Demand for Health Care

A good starting-point for understanding the theoretical aspects of individual health behaviour is to look at one of the most important contributions to this field of study within economics, namely the Grossman model of demand for health (Grossman 1972). In this model, which is constructed within a human capital framework, health is seen as a durable capital stock, which depreciates over the life cycle, and can be increased by investments consisting of inputs such as a healthy lifestyle (diet, exercise, recreation), but also medical services. “Good health” is in the Grossman model demanded by consumers for two reasons. Firstly, it increases the number of healthy days that permit market and nonmarket activities (in this aspect good health is seen as an investment good), and secondly, it improves welfare or utility (for which good health is also seen as a consumption good).

In the Grossman model, the demand for health care services is derived from the demand for health, which implies that all factors that influence the demand for good health,

also influences the demand for medical services (although not always in the same direction). Thus, medical services are not demanded for their own sake, but rather as a means to achieve good health (Grossman 1972). The benefit of consuming health care is an improvement in health status, and the cost of medical care is a reduction of consumption of other goods.

One aspect of the demand for health care which was not included in the original Grossman model, but contributed in later work of Acton (1975) and Christianson (1976) is the recognition that there exist different treatment choices in health care decisions. When ill, individuals face not only the decision of whether to seek care or not, they also need to decide what type of health care to use. They are faced with a set of alternative providers, each of which has a different potential impact on their health. Thus, they decide between various provider alternatives, including self-care, and weight the potential benefits of different alternatives to their (perceived) costs. Here, the price of care includes both monetary outlays and access costs such as the opportunity cost of travel time. Based on this information, and considering their income level, individuals choose the alternative that yields the highest utility (Dor et al. 1987).

Based on the theoretic assumptions presented above, we can conclude that individuals consume health care as a means of achieving good health and that they decide what type of health care to consume (if any), using the information available to them by weighing the costs of utilization to the perceived benefits of utilizing health services. This thesis parts from the notion that in a country setting such as that of Bangladesh, where women possess a marginal position in society, their health utilization behaviour is also coloured by their disfavoured position. Thus, in the following section, we systematically go through the demand-side factors which theoretically are expected to influence health service utilization, and provide a gender perspective where appropriate. Doing this, the Grossman framework has certainly been a source of inspiration, however, work from other economists as well as anthropologists and sociologists have also contributed<sup>2</sup>. While the Grossman model and its extensions provide important insights into the individual's decision to seek medical care, it provides little analysis of broader social and cultural determinants which are especially important in a developing country setting.

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<sup>2</sup> Among these are the Socio-behavioral Model of Health Care Utilization by Andersen (1995), and the Health Belief Model by Sheeran and Araham (1995 cited in Ahmed 2005)

## 2.2 Determinants of Health Care Utilization

Logically, *economic status* is an important determinant of health care utilization, since it reflects individual or household ability to pay for health services. With a higher wealth and thereby a higher budget, the individual can increase its investments in health. On the other hand, a wealthy individual's current income may affect health care consumption negatively since the opportunity cost of spending time in utilizing health services increases with income (Grossman 2000; Muurinen 1982). However, empirical findings from developing countries confirm pro-rich tendencies in health service utilization, in both the private and the public health sectors (Wagstaff 2002).

The *cost of access* to health care is shown to be another important determinant of health service utilization (Thaddeus and Maine 1994; Hjortsberg 2004). If an individual is ill and knows that health care will cure the disease, he or she might still not seek care if the marginal cost of access is too high (Hjortsberg 2003). The concept of access costs goes beyond billed charges such as physician and facility fees, and includes transport costs associated with the visit, as well as more indirect costs, such as the opportunity cost of utilization.

The utilization effect of user charges and distance are expected to be negative. Past studies generally confirm this relationship (Hjortsberg 2003; O'Donnell 2007). Travel time is expected to matter particularly in developing countries, where the majority of the population lives in rural areas and health care facilities as well as good road infrastructure are concentrated in cities.

Another important access variable is the opportunity cost of the time used to seek health services, which is represented by the time spent away from productive activities. Some evidence suggests that this cost could form more of a barrier to women's use of health care than men's (Thaddeus and Maine, 1994; Kutzin 1993). Even though women are less involved in the cash economy, the real social value of women's time might be higher than that of men, considering the workload and diverse responsibilities of a woman in the household. Kutzin (1993) suggests that "*it may be more costly for a household to lose the domestic and agricultural services provided by the woman than to lose a day's wages of a man*" (p. 9). Moreover, in many parts of the developing world, Bangladesh included, women are not allowed to travel alone to a health facility, instead they are obligated to be accompanied by

male adult relatives, which implies additional time and transport costs for the family as a whole when women seek health care (Thaddeus and Maine 1994).

The *age* of the individual is also supposed to affect health service utilization. According to the Grossman model, the stock of health depreciates with time, which also affects the marginal effect of health care on health, implying that more amount of health care is needed to sustain the same amount of health (Grossman 1972). It is known from earlier research that an individual's age influences the likelihood of illness. In developing countries, we would expect a U-shaped relationship between age and morbidity, implying that the health risks are highest for infants and elderly (Heller 1982). We would thus expect an increase in health care use among these groups. However, the shadow price of time is also expected to vary with age, and it gives effects on the costs of healthcare and thereby both the investment benefits and the opportunity cost of time used for seeking health care (Hjortsberg 2003). We can thus conclude that the effect of age on the propensity to use health care is ambiguous.

*Education*, which is often measured as years of schooling, is an important correlate to good health. Better educated persons are, through healthier lifestyles, expected to be more efficient producers of health (Grossman 1972). They are also expected to be able to determine which health care measures that should be undertaken at different situations, and thus to a larger extent be capable of practicing self-care efficiently when appropriate. Given this reasoning, we can thus expect highly educated individuals to maintain or achieve good health status without having to rely on health services to the same extent as individuals with less education (Dor et al.1987).

However, in a developing country context, where the majority of the population is relatively poorly educated, it might make more sense to look at the impact of "some education" versus "no education" on health service use. In these countries, there is commonly a problem of underutilization of services, especially of modern medicine. Improvements aiming at increasing literacy rates have shown to increase awareness of health problems, knowledge of the effects of different health care measures, and an ability to use this information more effectively (Chakraborty et al. 2003; Hjortsberg 2004). In this context, we could therefore expect literacy to have a positive impact on health care use, at least when speaking of modern health care.

Further, the decision of whether to seek care or not is dependent on the *health status* of the individual, and his/her opinion of to what extent health care will improve health status and thereby increase utility. A reasonable assumption is that individuals who suffer from more severe illnesses have greater incentives to seek health care, *ceteris paribus* (Hjortsberg 2004).

Yet, individuals might differ in their threshold level of pain that can be born without seeking medical care. There may also be differences between different groups in the socially accepted threshold levels. It has been shown that women typically wait longer to seek health care than men (Vlastoff 1994). Jorgensen, (1983, cited in Mahbud and Ahmed 1997) found that women in Bangladesh waited to seek treatment until they were so sick that they could no longer work. In another study, also cited in Mahbud and Ahemed (1997), Islam (1985) found that in Bangladeshi society typically a distinction was made between illnesses which did not affect a woman's working performance, and in that case no treatment was seen as needed, and illnesses that did affect her performance, in which case she was allowed to seek health care.

This brings us to discuss *gender* as a determinant of health service use. As have been shown in this chapter, many of the factors that affect health service utilization are intertwined with gender inequality, reflected in women's lower status in society. In developing countries, women often have lower educational status, less access to financial means, and are expected to be more negatively affected by barriers such as distance and costs.

Moreover, women's access to health services is expected to be limited by constraints on their autonomy. Female autonomy can be described as the ability of a woman to make decisions within the household relative to her husband. In many developing countries, men play an important role in determining the health needs of a woman. The decision to seek care depends on who controls the household resources –often the man – and he then decides when and where the woman should seek care (Shaikh and Hatcher 2004). The only studies that to the author's knowledge exists on women's autonomy and health care utilization, concerns maternal health services. These often find a positive relationship between female automony and service utilization (see Bloom et al. 2001, for evidence from India, or Woldemicael and Tenkorang 2010, for evidence from Ethiopia).



# 3 Setting the Context: Health and Health Care in Bangladesh

## 3.1 Health Situation

Since its independence in 1971, Bangladesh has achieved notable progress in various health indicators, mainly due to large-scale government programs (Hossen and Westhues 2011). Table 1 below shows some selected health and demographic indicators for the last two decades.

*Table 1. Demographic and health indicators, Bangladesh*

	1990/1991	2000/200	2005/2006
Under-5 mortality rate (probability of dying by age 5 per 1000 live births)	149	92	69
Children under five years of age underweight for age (%)	-	-	39.2
Life expectancy at birth (years) females	54.0	62.0	63.0
Life expectancy at birth (years) males	55.0	61.0	63.0
Total fertility rate (per woman)	4.4	3.3	2.9
Maternal mortality ratio (per 100 000 live births)	870	500	420
Population growth rate (%)	2.3	1.9	1.8

Source: WHO Statistical Information System (2011-08-22)

Table 1 reveals that under-five mortality rates have declined substantially (from 149 to 69 per 1000 live births) since the 1990s. Life expectancy has also improved, from 54 years for females and 55 years for males in 1991 to 63 years for both sexes in 2005/2006. Unlike most countries in the world, life expectancy has in Bangladesh historically been lower for women than for men (see Table 1). This gender gap has however narrowed during the time period, and has now disappeared.

Other improvements of health and socioeconomic indicators are declines in fertility rates (from 6.3 births per woman in 1970 to 2.9 in 2005/2006) and population growth rates from 2.3 in 1990/1991 to 1.8 in 2005/2006. Bangladesh is one of the most densely populated countries in the world and substantial efforts have been made to decline the population growth rate (Vaughan et al. 2000).

Although these improvements are certainly positive, health status remains poor, and there is still a long way ahead until national and international goals of health, such as the Millennium Development Goals (MDGs) are met. For instance, maternal mortality as well as infant mortality rates remains unacceptably high. Moreover, there are large inequalities in health outcomes between different socioeconomic groups, between men and women, as well as between geographical regions. The nutritional status of children also needs to be improved; today 39% of all children are classified as underweight. Research also shows proof of pro-male gender discrimination in the intra-household allocation of food and medical care, which in the long run leads to higher morbidity and mortality for girls than for boys (Chen et al 1981; Muhuri and Preston 1991; Klasen and Wink 2002). Moreover, poverty-related communicable diseases such as cholera and diarrhoea, typhoid, tuberculosis, and malaria are responsible for high mortality, especially among children (Islam and Ullah 2009; Vaughan et al. 2000). Only 34 percent of the population has access to sanitation, and as have already been noted, the main drinking water source in the country is not safe since it contains high levels of arsenic (Vaughan et al. 2000).

## 3.2 Health Care System

As in many other developing countries, medical pluralism, or the existence of several distinct therapeutic systems, is an important feature of the Bangladeshi health care system (Ahmed et al. 2000; Hossen and Westhues 2011). A wide range of therapeutic choices is available, from self-care to folk and western (allopathic) medicine. In this myriad, the public sector only stands for a small proportion of the service provision (Ahmed 2005; Vaughan et al. 2000). In the absence of any risk-pooling mechanisms and pre-payments, expenditures on health are often met by out-of-pocket payments by the households (Ahmed 2005). This mode of payments is highly regressive, and poses great financial risks on large groups, particularly the poor.

Since the distinction between public and private sectors of health care provision is of great importance in Bangladesh, this section looks at them separately.

### Public Sector

The Ministry of Health and Family Welfare (MOHFW) has the overall responsibility for health sector policy and planning in Bangladesh, and has as a main objective to ensure equitable provision of primary preventive and curative care for all Bangladeshis (Vaughan et al. 2000).

Over the past decade, the MOHFW has made strong policy commitments to improve the health situation in the country (Hossen and Westhues 2011). There have been massive investments in rural health infrastructure and various programs for providing primary health care at *thana* (district), union (sub-district) as well as village levels (Vaughan et al. 2000). However, research report that the public sector faces acute problems in several aspects of health care provision (Vaughan et al. 2000; Hossen and Westhues 2011; Bangladesh Health Watch, BHW 2007).

Firstly, although health care facilities may be geographically accessible, they are often underutilized (Ahmed 2005). Services are perceived to be of poor quality, and although most governmental health care is supposed to be free of charge, informal and unofficial charging is frequently reported (Vaughan et al. 2000; BHW 2007). Also, misuse, mismanagement and corruption weaken the overall public health care system (Islam and Ullah 2009). Another problem is that there is a huge shortage of qualified practitioners. Bangladesh has a density of 0.58 workers (doctors, nurses and midwives together) per 1,000 population (BHW 2007). BHW (2007) states that in order for the health system to perform optimally, 2.5 workers per 1000 population is needed, which leaves Bangladesh in the list of countries with “severe shortages” of health workforce. Research also indicate that there are high rates of absenteeism (around 40%) among medical doctors, especially in rural areas, which worsens the scenario even more (Ahmed 2005).

There are also a large number of NGOs involved in health care provision. Many of them operate separately from the MOHFW, but there are also increasing tendencies of partnerships between the government and NGOs, that works to improve access and quality of care, specifically in under-served areas (Vaughan et al. 2000; Ahmad 2007).

### Private Sector

Private healthcare providers play a significant role in the Bangladeshi health care system. In fact, when ill, around 85 percent of the people in Bangladesh turn to private sector providers (BHW 2007). This sector consists of informal village doctors, drugstore salesmen, traditional healers, and homeopathic practitioners. Especially village doctors are popular among the

public. They practice mostly allopathic systems of medicine but do frequently not have more than three months of training in diagnosing and treating common ailments (Ahmed 2005). The BHW found explanations behind their popularity to be mainly that since these providers have often been practicing in the area for a long period, they establish close relationships and a high level of trust with many families in the community. Moreover, in contrast to formal providers, they are often flexible in the mode of payments which is appreciated especially among the poor (BHW 2007). Drugstores that sell allopathic medicine on demand are another important health care provider in Bangladesh. These drug store salesmen often also give diagnoses, despite not having any formal professional training. Traditional medicine (faith healing and herbalists) also exist in the Bangladeshi health care system, but they have been declining and today occupy a very marginal position (Ahmed 2005)

There are various problems with the private health sector being so dominant. First of all, many of the practitioners do not have any formal training. Moreover, indiscriminate use of drugs such as antibiotics can lead to complications such as drug resistance. An examination of village doctors' and drug vendors' use of drugs for common diseases such as cold symptoms and diarrhoea, revealed that 18 percent of the drugs prescribed were appropriate for the conditions, 75 percent were inappropriate and 7 percent harmful for the patients (Iqbal et al. 2009).

Box 1 provides a categorization of the myriad of treatment choices to be made by an ill Bangladeshi.

*Box 1: Categorization of therapeutic choices in rural Bangladesh (Source: Ahmed 2005)*

**Self-care:** expanding from no medication other than rest and nursing to instances when common home-remedies (e.g. Oral Saline), over-the-counter (OTC) drugs, or herbal preparations are taken without consultation with any healthcare provider.

**Drug store salesmen (unqualified allopathic):** when consultation is made to seek diagnosis and treatment from a drug store salesman (excludes purchase of OTC without consultation); these drug retail outlets are mostly unlicensed and unregulated and only few of the salespeople may have 4 to 6 weeks certificate course on dispensing drugs.

**Traditional:** when treatment is sought from herbalists and spiritual healers; also included are homeopathic practitioners, negligible in proportion

**Para-professionals (semi-qualified allopathic):** when seeking treatment from: a) village doctors with short training in diagnosing and treating common ailments, mostly from private institutions of questionable quality; b) medical assistants who complete a three-year medical assistant training program and family-welfare visitors who complete eighteen-month training in pregnancy and delivery care, from a public institution; and c) various government and non-government community health workers who have some basic preventive and curative health training

**Professional allopath:** comprised of allopathic practitioners who have undergone six years of professional training including one year internship (MBBS doctors)

# 4 Data and Methods

## 4.1 Survey Description

The data used in this study was taken from the The Matlab Health and Socioeconomic Survey<sup>3</sup> (MHSS), which was carried out in 1996 to examine various health and socioeconomic factors in the Matlab sub district of rural Bangladesh. Matlab is a river delta region about 55 kilometres southeast of Dhaka city with roughly 200 000 inhabitants. As in most areas of southern Bangladesh, rice-growing and fishing are the main economic activities. Since the 1960s, Matlab has been the site of health research by ICDDR,B (International Centre for Diarrhoeal Disease Research, Bangladesh), which has maintained ongoing Demographic Surveillance System (DSS), thus providing reliable longitudinal demographic data for this population (Rahman et al. 1999b)

The sample selection process in the MHSS can be described as follows. At a first stage, 4364 households clustered in 2687 baris<sup>4</sup> were chosen. At this stage, a structured questionnaire, which was answered by the household head or the spouse of the household head, gathered general household level demographic and socioeconomic information. Within each household, a smaller group of individuals aged 15 and over were selected for individual interviews. For these interviews, another questionnaire was used to gather information about individual characteristics such as sex, educational status, occupation, acute and chronic morbidity, etc. A total of 11,151 adults were selected for individual interviews (Rahman et al. 1999b).

The MHSS was conducted for studying health and population with particular focus on adults and elderly. Thus, the sample technique was used to deliberately oversample individuals aged 50 and above. Using the dataset as it is, may therefore produce biased

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<sup>3</sup> MHSS is provided by RAND Corporation. Data and documentation of the MHSS can be downloaded from [www.rand.org/labor/FLS/MHSS/obtaining-data/download.html](http://www.rand.org/labor/FLS/MHSS/obtaining-data/download.html). For more information on RAND Corporation, please see [www.rand.org](http://www.rand.org)

<sup>4</sup> The bari is the basic unit of social organization in rural Bangladesh. A bari consists of clusters of households that are in close physical proximity.

coefficient estimates, since the probability of an individual being selected for participation was not random. To correct for these sampling issues, analytical frequency weights are used in regression analysis.

## 4.2 Model

On the basis of the theoretical framework discussed in Chapter 2, we may formulate hypotheses regarding which variables affect care-seeking behaviour. The aim is to estimate which factors influence the decision to seek health care and, with the background of medical pluralism in Bangladesh, also examine which factors that affect the decision to seek a specific type of care.

Following Hjortsberg (2003), the following model of health care utilization is constructed:

$$C = f(H, Z, I, A)$$

Where  $C$  is the individual's choice given that he/she is ill and includes: doing nothing, practicing self-care, seeking care from a qualified allopath, a village doctor, a practitioner of traditional medicine etc.  $H$  is a vector of health variables,  $Z$  is a vector consisting of household characteristics,  $I$  is a vector indicating individual characteristics, and  $A$  is a vector of access variables.

Data on  $C$ , the individual's treatment choice, was in the MHSS obtained by asking what type of health care provider, if any, was seen for different types of illness symptoms. Following Ahmed et al. (2000), we categorize the different types of treatment sought into four categories. The category "qualified allopaths" includes treatment seeking from individuals who have undergone professional medical training of modern scientific medicine, also known as allopathy or biomedicine. The "traditional" category consists of treatment options within faith healing and traditional systems of medicine including and homeopathy. The category "paraprofessionals" includes village doctors, drug store salesmen and health workers who obtain very basic preventive and curative health training. Unfortunately, there was no information in the data set regarding whether self-care was used or not, for which the category of "doing nothing" includes self-treatment.

The first vector of explanatory variables,  $H$ , reflects the individual's health status. Here, acute morbidity is measured, and all illness episodes during the preceding month are included.

Symptoms were classified into categories, or “types” of illnesses. Minor health conditions, such as headache or eye infection are not included, since the idea is to capture more severe health conditions. This leaves seven illness categories to include in the analysis. These are cough/fever/cold symptoms; vomiting/stomach ache; fever with chills (e.g. malaria/typhoid); watery diarrhoea; loose stool associated with mucus or blood; skin problems; and accidental cause (e.g. a cut in a hand or a leg). All variables were made into dummy variables and “skin problems” was used as a reference category, since it is a common symptom of arsenicosis and thus of specific interest for this study. Sometimes treatment was sought for more than one symptom at the time, say symptom A and B, and that visit was thus reported as seeking the same type of care for both types of illnesses. When this was the case, there is unfortunately no way of knowing whether a person chose a certain health care provider for symptom A, which perhaps was considered more severe than symptom B, and once at the health provider, took the opportunity to seek care for symptom B, or if the person had entirely independent reasons for the visit.

The limitations of using self-perceived morbidity as a measure of health status, since it is subjective and especially affected by recall and measurement bias, are well-recognized in the health economics literature (Rannan-Eliya and Somanathan (2006); Jowett et al, 2004). Knowledge and illness experience, as well as stigma, impact how individuals report their illnesses. Moreover, research shows that women from low socioeconomic classes tend to underreport illness symptoms (Okojie 1994). These issues are difficult to deal with in empirical research, and in many cases it is impossible to control for them. As an effort to improve the reliability of the illness reporting, the researcher can limit the recall period, which diminishes the risks that respondents forget illness sequences or remember them wrongly. In the MHSS, the recall period is one month, which in comparison with other studies could be considered acceptable, although a shorter one, e.g. a 15-days period, would have been more desirable (Ahmed et al. 2000).

The second vector,  $Z$ , is a vector indicating household characteristics. The first variable of this vector is economic status. When measuring economic status in developing countries, household consumption is considered a better proxy than income since it is less sensitive to short-term fluctuations and since it includes the value of home production (Hjortsberg 2003; Dor et al. 1987). Home production is the major non-market activity in a subsistence economy, such as the one in Bangladesh. Thus, economic status is here measured by considering the weekly consumption of food products in the household. The total value in taka (the Bangladeshi currency) of food items consumed by the whole household is calculated, and

then divided by number of household members. Comparing the result with a food poverty line in taka per person per month provided by the World Bank (World Bank 1998), we get a threshold poverty level and can thus label households as “poor” or “non-poor”<sup>5</sup>. Non-poor households are expected to utilize health services more frequently than poor households.

In Bangladesh the family union is strong, and many important decisions are made within the household. We theorize that the head of the household<sup>6</sup> makes decisions bearing the consumption pattern of all household members. This is also valid for the decision to use health services and should therefore be considered in the analysis care-seeking behaviour of a given family member<sup>7</sup> (Hjortsberg 2004).

Since the household head is supposedly the one deciding if, when and where the other household members should seek care, considering the educational status of that person seems reasonable. Based on the theoretical discussion in Chapter 2, literacy is used as a proxy for educational status. We expect individuals who are able to read and write to be more likely to utilize modern health care, since they are expected to have more understanding of the need for health services, and can better understand health campaigns and health education programs. The effect of literacy on other types of health care (paraprofessional and traditional) is however unclear.

A variable showing the sex of the head of household is also included in the analysis. The effect of this variable is however not clear. On the one hand, there is some evidence showing that female-headed households tend to allocate resources towards health and education to a larger extent than male-headed households (Morrison et al. 2007), which speaks in favour of a positive effect of having a female head on health care use. On the other hand, female-headed households are often poorer than male-headed households (Matsumura and Gubhaju 2001). Wickrama and Keith (1990) report that in rural areas of South Asia, households run by women are most often the results of a situation in which the husband has either passed away or has temporarily or permanently migrated. This usually leaves the woman as the sole provider of the household, and given women’s lower labour-selling status

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<sup>5</sup> The food poverty line is 425.32 taka, which corresponds to 2,122 kcalories per person per day (World Bank, 1998, p. 57)

<sup>6</sup> In the MHSS, head of household is defined as “someone among the group of householders who is responsible for satisfying daily necessities of the household or someone who is regarded/assigned as the head of household”.

<sup>7</sup> As an expansion of the Grossman model, various studies from the developed world has also lately focused on the family, rather than the individual, as a producer of health (see e.g. Jacobsson 2000; Bolin et al. 2002).



relative to that of men, these households are more likely to have a low economic status, which is negatively correlated to health care use (Wickrama and Keith 1990).

The fourth vector, *I*, includes a set of individual characteristics. These are age, gender and education. The age variable is grouped into three different groups: 15-29, 30-44, 45-59 and 60 plus. Given the discussion in Chapter 2, we cannot anticipate which group that is more probable to utilize health care.

Education is once again proxied by literacy, and we anticipate literate individuals to seek care to a larger extent than illiterate. Gender, which is the most interesting variable for this thesis, is represented as a dichotomous variable where female is one and male is zero. Given the theoretical discussions and empirical results presented earlier in this thesis, we expect “being female” to be negatively correlated with health care use. Earlier research (see Matsumura and Gubhaju 2001) has indicated that women in particular tend to underutilize formal medicine and to a larger extent depend on traditional or non-qualified practitioners, for which the same pattern is anticipated in this analysis.

The fifth vector, *A*, reflects access to health care. In this study, three access variables are used, namely distance (measured in time it takes to reach a given health facility to the household), out-of pocket payments for transportation, and visit fees. Higher costs of access are expected to decrease utilization.

Research commonly includes a rural/urban residence variable when studying health care use (Matsumura and Gubhaju 2001; Jowett et al. 2004). The reason for this is that health care services are often more accessible for households residing in urban areas compare with those in rural areas, due to better infrastructure and a larger variety of services provided. However, in the context in which this study is performed, this reasoning is not fully accurate. Firstly, Matlab is a mainly rural area without larger cities. Secondly, as mentioned in section 4.1, Matlab has for years been the study site of a Demographic Surveillance System (DSS), which gives it somewhat special features of health care access. In the 1970s, half of the area was designated “program area” and half “comparison area”. In the program area, significantly more health intervention and health education programs are present than the comparison area. Whether a household is situated in the program or the comparison area can thus be considered as a proxy for accessibility to modern health care. A dummy variable for whether the household is situated inside the program area or not is therefore included in the model.

Quality, or rather perceived quality is another important determinant of health care use, and it would have been desirable to incorporate it in the analysis (Wagstaff, 2002). However,

as is the case in many other surveys, no information regarding quality of services was available in the MHSS.

### 4.3 Method

In this thesis, we wish to establish what factors determine health care utilization. The outcome variable,  $y_i$ , thus takes a binary form, where

$y_i = 1$  if individual  $i$  utilizes health care

$y_i = 0$  if individual  $i$  does not utilize health care

When dealing with binary responses, ordinary least squares (OLS) is in most cases not an appropriate technique to use, since the OLS standard assumptions are not satisfied<sup>8</sup> (Verbeek 2008). Instead, nonlinear binary choice models, also referred to as *logit* and *probit* models, are more suitable. Logit and probit models generally give very similar results in empirical work (Verbeek 2008), and since most previous research of health care utilization uses the logit model, the same line is followed in this thesis.

The probability that a given individual utilizes health services, i.e. that the outcome variable takes the value 1, given a set of explanatory variables, can be written as

$$P(y = 1|\mathbf{x})$$

Following Long (1997), this probability can be transformed into an *odds ratio*:

$$\frac{P(y = 1|\mathbf{x})}{P(y = 0|\mathbf{x})} = \frac{P(y = 1|\mathbf{x})}{1 - P(y = 1|\mathbf{x})}$$

which indicate how often an event ( $y = 1$ ; the individual utilizes health care) occurs, relative to how often it does *not* occur ( $y = 0$ ; the individual does *not* utilize health care).

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<sup>8</sup> OLS regression requires the dependent variable to satisfy normality, homoscedasticity, and independence assumptions. A linear model with binary responses violates all these requirements.

Taking the natural logarithm of the odds ratio, and including a set of explanatory variables gives us the following expression:

$$\ln \left[ \frac{P(y = 1|\mathbf{x})}{1 - P(y = 1|\mathbf{x})} \right] = \mathbf{x}\boldsymbol{\beta}$$

This model is the logistic regression model, which is curvilinear rather than linear, and thus suits binary responses well<sup>9</sup>. The log of the odds, i.e. the left hand side of the equation, is known as the *logit* (Long 1997). As we can see, the model is *linear in the logit*, that is, the log odds are a linear combination of the  $x$ 's and the  $\beta$ s (Long and Freese 2006).

The logit regression estimates parameter values of the  $\beta$  coefficients via the maximum likelihood method. Since the model is linear in the logit, we expect a unit change in  $x_k$ , to result in a change in the log odds (the left hand side of the equation) equal to  $\beta_k$ , holding all else equal. However, since understanding what a change in the log odds actually means is not uncomplicated, another transformation is needed (Long and Freese 2006). By taking the exponential of both sides of the equation, we get coefficients in terms of odds ratios, which are easier to interpret. Now, for a unit change in  $x_k$ , we expect the odds to change by a factor of  $\exp(\beta_k)$ , holding all other variables constant (Long and Freese 2006). Put differently, odds ratio values greater than 1 indicate that the variable in question increases the odds of the event of interest occurring (here, utilization of health care) and values less than 1 (i.e. between 0 and 1), indicate a decrease in the odds.

In this study, we are interested in both the decision to have any health service use at all, and also in the type of provider the individual choose for treatment, in the event of illness. Thus four different logistic models are constructed, with respect to (1) any type of treatment sought; (2) treatment sought from qualified allopathic practitioners, (3) treatment sought from paraprofessionals, and (4) treatment sought from traditional practitioners. In Model 1, any type of health care sought was coded "1", and no health care sought was coded "0"; in Model 2, cases when health care was sought from qualified allopaths was coded "1" and all other cases were coded "0", in Model 3, cases when health care was sought from paraprofessionals was coded "1" and all other cases were coded "0", and lastly, in Model 4, traditional practitioners were coded as "1" and all others as "0".

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<sup>9</sup> In a linear model, we would have to tackle probabilities larger than 1 and smaller than 0. This is of course rather inconvenient. Instead, in a curvilinear model, the probabilities range from 0 to 1, as we wish them to do.

These models are estimated *conditional* on the individual being ill, i.e. prior to running the regressions all individuals that did not report any illness during the recall period were excluded. This is somewhat problematic since the sample we use for analysis is thus not a random draw. However, the descriptive statistics in Chapter 5 show that in this case, the sample used for analysis reflects the entire sample in a satisfactory way, for which the non-randomness is deemed to not be a major problem.

## 5 Descriptive Statistics

This chapter presents unweighted descriptive statistics of the data used in this thesis. Included in the sample are 11,151 observations of which 4,195 (38%) report having had one or more illness symptoms during the past one month. Table 2 provides some demographic and economic indicators of the whole sample, and table 3 provides the same information for the individuals reporting illness.

*Table 2. Population characteristics*

	Females	Males	All
Sex (%)	54.4	45.6	100.0
Mean age	39.3	41.3	40.2
Littearacy rate (%)	36.3	53.2	44.0
Poverty rate (%)	70.6	69.2	70.0

*Table 3. Characteristics of individuals reporting illness*

	Females	Males	All
Sex (%)	54.8	45.2	100.0
Mean age	40.4	42.6	41.4
Littearacy rate (%)	36.6	51.6	43.4
Poverty rate (%)	71.0	67.8	69.5

The descriptive statistics reveal that as much as 70 percent of the respondents live in households that are classified as poor. The literacy rate is slightly over 50 percent for men and solely around 35 percent for women. Mean age is about 40 years and somewhat lower for women than for men.

From the two tables it can be concluded that background characteristics vary little between the two samples. This point towards that, despite the sick individuals have not been chosen randomly, they are representative for the whole sample.

Table 4 shows prevalence of different illness types among men and women. Cough/fever/cold symptoms were by far the most common illness type among both men and women. Apart from this, the illness profiles differ somewhat between men and women.

*Table 4. Prevalence of illness types, men and women (percentages)*<sup>10</sup>

	Males	Females	All
Skin problems	2.5	1.7	2.1
Cough/fever/cold	28.1	27.3	27.7
Vomiting/stomach ache	4.0	7.0	5.6
Fever with chills (e.g. malaria/typhoid)	0.3	0.5	0.4
Watery diarrhoea	2.8	5.0	4.0
Loose stool associated w. mucus or blood	3.5	3.3	3.4
Accident	1.4	0.9	1.1

These figures should be interpreted with care. Firstly, because they are self-reported, and secondly, because there can be stigma attached to certain diseases which might cause underreporting of some illnesses. In mind should also be kept that, as stated in Chapter 4, especially women tend to underreport illnesses.

Table 5 gives descriptive statistics which can serve as a first picture of the health-seeking behavior of the sample.

*Table 5. Characteristics and health care utilization of ill individuals (percentages)*

	Prevalence of illness	Sought any type of care	Qualified provider	Para-professional	Traditional	Other
Total	37.6	54.0	6.3	45.2	2.2	0.4
<i>Sex</i>						
Female	37.9	47.5	6.2	38.1	2.6	0.5
Male	37.3	61.9	6.3	53.8	1.8	0.2
<i>Poverty</i>						
Poor	37.4	52.7	4.8	45.4	2.4	0.4
Non-poor	38.2	56.7	9.6	44.8	1.9	0.2
<i>Literacy</i>						
Literate	37.1	57.5	8.5	45.6	2.9	0.5
Illiterate	38.1	51.4	4.6	44.9	1.7	0.3

Although morbidity rates are very similar for men and women, only 48 percent of the ill females decided to seek health care, compared to 62 percent among males. A chi-square test reveal that this finding is statistically significant ( $p$ -value=0.0005), and is thus not solely due

<sup>10</sup> Note that the same respondent can report having had more than one type of illness during the recall period.

to the variation in the sample. The most popular provider was the paraprofessional group; 45 percent of the ill individuals chose this type of provider. No more than approximately six percent chose a qualified provider, and a little over two percent a traditional one. These findings are similar to what has been reported from Bangladesh elsewhere. For example, The Bangladesh Health Watch (BHW) (2007) states that on average 60 percent of the population in Bangladesh turn to unqualified practitioners when ill, and paraprofessionals are described as the most popular group.

From Table 5 can also be seen that women have sought more care from traditional providers than men, this is however not statistically significant. An interesting finding is that that significantly more males than females sought care at a paraprofessional provider (p-value=0.0005).

There is no significant difference between poor versus non-poor and literate versus illiterate in morbidity rates in the sample. However, we can conclude that significantly more non-poor than poor sought care at a qualified provider (p-value=0.0005), and that the same applies for literate versus illiterate individuals (p-value=0.0005). Literate individuals also sought care from traditional providers to a larger extent than illiterate ones (p=0.025), which is somewhat surprisingly.

*Table 6. Access variables<sup>11</sup> (averages)*

	<b>Qualified provider</b>	<b>Para-professional</b>	<b>Traditional</b>
Time to reach provider (minutes)	40.1	17.1	19.0
One-way transportation cost (taka)	6.1	1.5	1.9
Visit cost (taka)	0.6	3.5	6.9

Table 6 provides some statistics of the access variables included in the models. The first row presents the average time it takes to reach the different types of providers from the individual's household, each referring to the *nearest* qualified; paraprofessional; traditional provider, respectively. The same reasoning applies for one-way transportation costs and visit costs; the individual was asked to list the different providers that he/she knew about, and state the transportation and visit costs to them, then the most "accessible" (the one with the lowest transportation cost or the one with the lowest visit cost) in each category was chosen. This

<sup>11</sup> 1 USD=42 Taka (31st December 1996)

thus gives perceived and not actual access costs, which, given the theoretical discussion in Chapter 2, is probably what matters when the individual decides on health care use.

The paraprofessionals seem to be the health care providers generally closest situated to the households, and the transportation costs to them are generally low, which indicates that they are easily accessible. The qualified providers seem less accessible in terms of transportation and time costs; they have the highest average cost of both these indicators. The BHW (2007) has calculated the density of qualified modern practitioners to be on average 7.7 per 10,000 population in Bangladesh, while village doctors (here included in the paraprofessional category) have a density of 12.5 per 10,000 and drug store sellers (also included in the paraprofessional category) to have a density of 11.4. These findings make our results seem reasonable. However, it is somewhat surprising that qualified practitioners are not seen as more accessible in an area in which half of the population lives in the “program area” of the DDS where governmental health interventions are frequent.

Table 6 also reveals that visit costs in the qualified category are much lower than the visit costs for both paraprofessionals and traditional providers. Qualified providers, which often tied to the government or NGOs, are often heavily subsidized and therefore frequently free of charge. In fact, 97 percent of the respondents stated that they knew of a qualified practitioner that did not charge any cost of visits. The same was true in 85 percent for the paraprofessionals and 64 percent of the traditional practitioners. However, qualified providers are much less frequently used than paraprofessionals. This is an interesting finding, and could indicate that visit cost does not matter as much as time costs.



## 6 Regression Results

Tables 7-10 show the results of the four logit models explaining the individual's choice of health care provider. The results are presented as odds ratios, with robust standard errors shown in parenthesis. All variables are constructed as dummy variables, and for each category of variables, one reference group is given. That is, the results show the impact of one characteristic of the individual on the probability of seeking care, in comparison with the reference category. Note that, despite not shown in the same table, all four variable vectors (individual and household characteristics, categories of illness, and access variables) are simultaneously included in each model. The purpose of dividing them into separate tables is solely to ease the reading.

Wald chi-square tests are used for determining the over-all goodness of fit of the models, and they show that all four models generally fit the data well ( $p < 0.01$  in all models). The Wald Chi-square test statistics and p-values for these tests are given in the tables, together with McFadden's adjusted pseudo R-squared, which is comparable to the adjusted R-squared in OLS regression. The low values of R-squared should not come as a surprise, since they are always low in these type of models (Diehr et al. 1999). Moreover, predicting utilization of health services is of course a difficult task, since it is a complex behavioral phenomenon and a regression model cannot possibly account for all relevant factors. Individual Wald Chi-square tests reveal which variables are significantly different from zero. A correlation matrix is calculated to check for multicollinearity in the sample. As is the case for most micro-data, no multicollinearity seems to be present (no explanatory variables have a correlation higher than 0.4).

Table 7 shows results of the different categories of illnesses, with skin problem as reference group. In Model 4, the "accident" category was removed, since there were not any observations included in the regression in which the respondent had indicated having suffered an accident and seeking care at a traditional practitioner<sup>12</sup>.

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<sup>12</sup> Stata uses a listwise deletion by default, which means that if there is a missing value for any variable in the logistic regression, the entire observation will be excluded from the analysis. In this case, 49 individuals indicated that they had suffered an accident and sought care at a traditional provider. However, all these

In the first model, the probability of seeking any type of care at all is significantly higher for cough/fever/cold symptoms, fever with chills, loose stool associated with mucus or blood, and accidental causes, than for skin problems. The results are similar for the other models, even though the significance levels of the diseases differ somewhat. The probability of seeking care from a qualified allopath is 5.3 times greater among patients who had an accident compared to the ones suffering from skin problems. These results indicate that, all else equal, individuals do not prioritize seeking care for skin problems to the extent that they do for other diseases.

*Table 7. Odds ratios of seeking different types of health care. Categories of illness*

	Model 1 Any type of provider	Model 2 Qualified allopaths	Model 3 Para- professionals	Model 4 Traditional practitioners
<b>Categories of illness</b>				
Skin problems (ref)	1.000	1.000	1.000	1.000
Cough/fever/cold	2.145*** (0.321)	1.644 (0.552)	1.672** (0.286)	1.425 (0.498)
Vomiting/stomach ache	1.165 (0.186)	1.852** (0.558)	1.139 (0.207)	2.087** (0.624)
Fever with chills	2.850** (1.414)	0.566 (0.389)	2.070 (0.990)	2.790 (2.493)
Watery diarrhoea	1.244 (0.227)	1.464 (0.721)	1.087 (0.216)	0.806 (0.349)
Loose stool w. mucus/blood	1.777* (0.367)	1.264 (0.533)	1.525** (0.317)	3.545** (1.821)
Accident	1.828* (0.621)	5.271** (2.819)	1.595 (0.564)	N/A
<b>Household characteristics</b>	YES	YES	YES	YES
<b>Individual characteristics</b>	YES	YES	YES	YES
<b>Access variables</b>	YES	YES	YES	YES
	No of obs. 3596 Wald $\chi^2(24)=114.02$ Prob > $\chi^2=0.0000$ Adj. R <sup>2</sup> =0.036	No of obs. 3596 Wald $\chi^2(24)=92.87$ Prob > $\chi^2=0.0000$ Adj. R <sup>2</sup> =0.069	No of obs. 3596 Wald $\chi^2(24)=118.89$ Prob > $\chi^2=0.0000$ Adj. R <sup>2</sup> =0.043	No of obs. 3597 Wald $\chi^2(23)=54.71$ Prob > $\chi^2=0.0002$ Adj. R <sup>2</sup> =0.015

Significance levels \* P<0.05; \*\* P<0.01; \*\*\* P<0.001

In table 8, the results concerning household characteristics are presented. Individuals from households that fall below the poverty line are, compared with individuals from non-poor households, significantly less likely to seek any type of care. This finding is consistent with

observations were removed from the regression since each of these observation indicated missing value for some other(s) variable(s).

other research from Zambia (Hjortsberg 2003), as well as from Bangladesh (Ahmed et al. 2000). When it comes to seeking care from qualified providers, this relationship is in our sample even more significant and poor householders are as much as approximately 50 percent less likely to seek care from qualified allopaths than non-poor householders are (OR=0.497, p-value= 0.002). This finding is also in line with previous research from Bangladesh. Ahmed et al. (2005) found individuals from poor household to be significantly less likely to seek care from qualified allopaths, compared to non-poor. However, they found the odds ratio to be 0.7. Another interesting finding is that individuals from households where the head is female are almost twice as likely to seek care from qualified allopaths, compared with individuals living in a male-headed household (OR=1.935, p-value=0.044). This supports the hypothesis that female-headed households tend to allocate resources towards health and education to a larger extent than male-headed households

*Table 8. Odds ratios of seeking different types of health care. Household characteristics.*

	Model 1 Any type of provider	Model 2 Qualified allopaths	Model 3 Para- professionals	Model 4 Traditional practitioners
<b>Household characteristics</b>				
<i>Poverty status</i>				
Non-poor (ref.)	1.000	1.000	1.000	1.000
Poor	0.815* (0.091)	0.497** (0.113)	0.944 (0.115)	0.990 (0.308)
<i>Gender of HH head</i>				
Male (ref.)	1.000	1.000	1.000	1.000
Female	1.342 (0.242)	1.935** (0.634)	1.064 (0.193)	0.925 (0.432)
<i>Literacy of HH head</i>				
Illiterate (ref.)	1.000	1.000	1.000	1.000
Literate	1.082 (0.143)	1.174 (0.315)	1.095 (0.153)	1.028 (0.300)
<b>Categories of illness</b>	YES	YES	YES	YES
<b>Individual characteristics</b>	YES	YES	YES	YES
<b>Access variables</b>	YES	YES	YES	YES
	No of obs. 3596	No of obs. 3596	No of obs. 3596	No of obs. 3597
	Wald	Wald	Wald	Wald
	$\chi^2(24)=114.02$	$\chi^2(24)=92.87$	$\chi^2(24)=118.89$	$\chi^2(23)=54.71$
	Prob > $\chi^2=0.0000$	Prob > $\chi^2=0.0000$	Prob >	Prob > $\chi^2=0.0002$
	Adj. R <sup>2</sup> =0.036	Adj. R <sup>2</sup> =0.069	$\chi^2=0.0000$ Adj. R <sup>2</sup> =0.043	Adj. R <sup>2</sup> =0.015

Significance levels \* P<0.05; \*\* P<0.01; \*\*\* P<0.001

In table 9, the results concerning individual characteristics are presented. The most essential variable for this thesis is the one indicating gender (male or female). From Model 1 and Model 3, the results indicate that being female is significantly lowering the probabilities of seeking care from both “any type” of provider and from paraprofessionals, compared to being male. Females are as much as 50 percent less likely than men to seek care, and this finding is strongly significant. It is also worth mentioning that with an 11percent level of significance, we can conclude that females are 64.7 percent more likely to seek health care from a traditional practitioner than males are (OR 1.647, p-value 0.109). Literacy is also shown to be a significant predictor of seeking qualified health care. This result has been noted elsewhere (Ahmed et al. 2000) Literate individuals are 2.3 times as likely to seek qualified care as non-literate individuals (OR=2.310, p-value 0.004), all else being equal. It also seems as individuals aged 45-59 are more likely to seek care from both qualified allopaths and traditional practitioners, compared to the reference group of 15-29 year olds.

*Table 9. Odds ratios of seeking different types of health care. Individual characteristics.*

	Model 1 Any type of provider	Model 2 Qualified allopaths	Model 3 Para- professionals	Model 4 Traditional practitioners
<b>Individual characteristics</b>				
<i>Age (years)</i>				
15-29 (ref.)	1.000	1.000	1.000	1.000
30-44	1.138 (0.158)	1.635 (0.489)	1.007 (0.145)	0.600 (0.217)
45-59	1.034 (0.151)	1.784* (0.564)	0.968 (0.152)	0.242** (0.111)
60+	0.841 (0.137)	0.918 (0.355)	0.894 (0.151)	0.439 (0.225)
<i>Literacy</i>				
Illiterate (ref.)	1.000	1.000	1.000	1.000
literacy	1.021 (0.145)	2.310** (0.664)	0.818 (0.122)	1.022 (0.343)
<i>Gender</i>				
Male (ref.)	1.000	1.000	1.000	1.000
Female	0.497*** (0.055)	1.178 (0.283)	0.532*** (0.061)	1.647 (0.512)
<b>Categories of illness</b>	YES	YES	YES	YES
<b>Household characteristics</b>	YES	YES	YES	YES
<b>Access variables</b>	YES	YES	YES	YES
	No of obs. 3596 Wald $\chi^2(24)=114.02$ Prob > $\chi^2=0.0000$ Adj. R <sup>2</sup> =0.036	No of obs. 3596 Wald $\chi^2(24)=92.87$ Prob > $\chi^2=0.0000$ Adj. R <sup>2</sup> =0.069	No of obs. 3596 Wald $\chi^2(24)=118.89$ Prob > $\chi^2=0.0000$ Adj. R <sup>2</sup> =0.043	No of obs. 3597 Wald $\chi^2(23)=54.71$ Prob > $\chi^2=0.0002$ Adj. R <sup>2</sup> =0.015

Significance levels \* P<0.05; \*\* P<0.01; \*\*\* P<0.001

In table 10, we examine the importance of access variables. As in Chapter 5, The variables indicating costs of transportation and visit costs to the different health care provider categories are constructed by asking the respondent about the *lowest* costs, i.e. if the individual knows about more than one qualified provider, he or she is asked to report the visit cost associated with seeing the doctor for which this cost is lowest. The same reasoning applies for transportation costs and time to reach provider.

Earlier research show that access costs matter for health care utilization. A study from Vietnam found distance to be the main determinant of delay of utilization (Ensor 1996). In another study from Nigeria, it was found that the choice of facility was made as a function of distance (Egunjobi 1983, cited in Thaddeus and Maine 1994).

The results from the regressions is in line with these results. that access variables matter for health care utilization. In Model 1, the probability of seeking any type of care is significantly determined by whether the individual has to pay for transportation to a qualified allopath, whether there is any user charges when seeing a qualified allopath, and whether there is any visit cost to paraprofessionals.

Models 2 and 3 reveal that, all else equal, if it takes more than 30 minutes to reach a qualified allopath or a paraprofessional from the household, the probability of seeking care from that specific type of provider is around 50% compared to if it takes 30 minutes or less (qualified allopaths OR: 0.500, p-value: 0.080; paraprofessionals OR: 0.567, p-value: 0.001). The same type of result applies for the transportation cost to reach paraprofessionals. The probability of seeking care at a paraprofessional when there is a transportation cost associated with the visit, is significantly lower (about 50% lower) than if there is no transportation cost (OR: 0.552, p-value 0.000).

Another interesting finding which has not been shown in earlier research, is that there are indications of the three different types of healthcare providers being substitutes to each other, since the probability of utilizing each one of them is determined by the access costs of the others. For example, if it takes more than 30 minutes to reach a qualified allopath, the probability of seeking care at a paraprofessional increases with 67.9% compared to if the time is less than 30 minutes (OR=1.679, p-value=0.000). If there on the other hand is a transportation cost associated with seeing a paraprofessional, the probability of seeing a qualified practitioner increases with 59.7% (OR=1.597, p-value=0.077).

There are also indications that qualified allopaths and traditional practitioners are substitutes, which is less intuitive. If there is a visit cost associated with seeing a qualified allopath, the probability of seeing a traditional practitioner increases with over 400 percent

(OR: 4.690, p-value: 0.007). On the other hand, if the time it takes to reach a traditional practitioner exceeds 30 minutes, the probability of seeking care at a qualified allopath increases with 70 percent, compared to if it takes 0-30 minutes (OR: 1.704, p-value: 0.055).

From Model 3, we can, somewhat surprisingly, conclude that living inside the treatment area increases the probability of seeking care from a paraprofessional, compared to living outside the treatment area. One would expect the opposite relationship, since the availability of qualified health care is much larger inside than outside the treatment area, and thus that the individual would choose to seek care from a paraprofessional to a lower extent when living inside the treatment area, and rather seek care from qualified allopaths. Even though not significant, the probability of seeking care from a qualified provider is larger when living inside the treatment area and the probability of seeking care from a traditional practitioner is lower, when living inside the area. These findings are more in line with what we would expect. The result for paraprofessionals is hard to explain, and shows on the complexity of health seeking behavior.

*Table 10. Odds ratios of seeking different types of health care. Access variables.*

	Model 1 Any type of provider	Model 2 Qualified allopaths	Model 3 Para- professionals	Model 4 Traditional practitioners
<b>Access variables</b>				
<i>Location of the household</i>				
Outside treatment area (ref.)	1.000	1.000	1.000	1.000
Inside treatment area	0.982 (0.110)	1.174 (0.239)	1.235* (0.144)	0.684 (0.211)
<i>Time to reach nearest qualified allopath from HH (minutes)</i>				
0-30 (ref.)	1.000	1.000	1.000	1.000
30+	1.191 (0.157)	0.500* (0.132)	1.679*** (0.229)	0.615 (0.207)
<i>Time to reach paraprofessional from HH (minutes)</i>				
0-30 (ref.)	1.000	1.000	1.000	1.000
30+	0.797 (0.130)	0.650 (0.202)	0.567*** (0.095)	1.981* (0.710)
<i>Time to reach traditional practitioner from HH (minutes)</i>				
0-30 (ref.)	1.000	1.000	1.000	1.000
30+	1.040 (0.149)	1.704* (0.474)	1.154 (0.174)	1.066 (0.398)
<i>One way transportation cost to qualified allopath from HH (taka)</i>				
No cost (ref.)	1.000	1.000	1.000	1.000
Cost>0	1.159 (0.148)	1.028 (0.285)	1.157 (0.152)	1.318 (0.469)

<i>One way transportation cost to para-professional from HH (taka)</i>				
No cost (ref.)	1.000	1.000	1.000	1.000
Cost>0	0.653** (0.110)	1.597* (0.423)	0.552*** (0.092)	0.955 (0.366)
<i>One way transportation cost to traditional practitioner from HH (taka)</i>				
No cost (ref.)	1.000	1.000	1.000	1.000
Cost>0	1.031 (0.166)	0.948 (0.231)	0.839 (0.148)	1.060 (0.412)
<i>Visit cost to qualified allopath (taka)</i>				
Free of charge (ref.)	1.000	1.000	1.000	1.000
Cost>0	0.515* (0.188)	0.349 (0.239)	0.560* (0.189)	4.690* (2.689)
<i>Visit cost to para-professional (taka)</i>				
Free of charge (ref.)	1.000	1.000	1.000	1.000
Cost>0	0.727** (0.116)	0.764 (0.249)	0.843 (0.143)	1.121 (0.408)
<i>Visit cost to traditional practitioner (taka)</i>				
Free of charge (ref.)	1.000	1.000	1.000	1.000
Cost>0	0.995 (0.112)	0.966 (0.218)	1.041 (0.123)	1.111 (0.350)
<b>Categories of illness</b>	YES	YES	YES	YES
<b>Household characteristics</b>	YES	YES	YES	YES
<b>Individual characteristics</b>	YES	YES	YES	YES
	No of obs. 3596 Wald $\chi^2(24)=114.0$ 2 Prob > $\chi^2=0.0000$ Adj. R <sup>2</sup> =0.036	No of obs. 3596 Wald $\chi^2(24)=92.8$ 7 Prob > $\chi^2=0.0000$ Adj. R <sup>2</sup> =0.069	No of obs. 3596 Wald $\chi^2(24)=118.8$ 9 Prob > $\chi^2=0.0000$ Adj. R <sup>2</sup> =0.043	No of obs. 3597 Wald $\chi^2(23)=54.7$ 1 Prob > $\chi^2=$ 0.0002 Adj. R <sup>2</sup> =0.015

Significance levels \* P<0.05; \*\* P<0.01; \*\*\* P<0.001

# 7 Arsenicosis in Bangladesh

This chapter puts focus on access to health care and health-seeking behavior in Bangladesh. The findings from three focus group discussions, which took place in rural areas highly contaminated with arsenic, are presented. In order to increase understanding for the context, the chapter begins with an introduction to the arsenic situation in Bangladesh.

## 7.1 The Arsenic Situation in Bangladesh

Diarrhoeal diseases caused by microorganisms in the surface water, which historically have been the main source of drinking water, have long plagued Bangladesh as a large health hazard (Smith et al. 2000). In the 1970s, the United Nations Children's Fund (UNICEF) worked together with the Bangladeshi Department of Public Health and Engineering to install tube-wells which were supposed to provide "pure water" to the population (Smith et al. 2000). However, in the beginning of the 1990s, toxic levels of arsenic were detected in tube-well water used by millions of people.

Long-term exposure to arsenic-contaminated drinking water implies serious adverse health effects. These range from skin lesions to various forms of cancer, cardiovascular and pulmonary disease, as well as diabetes (Smith et al. 2000). The disease develops slowly and in stages and it normally takes several years before symptoms start manifesting. When the symptoms become chronic the health state is called arsenicosis<sup>13</sup>.

To date, there is no cure for arsenic poisoning. However, the health state is considered to be reversible before it becomes chronic, which is why early detection is crucial. The recommended measures for patients are first of all to stop drinking contaminated water, followed by systematic treatment of skin lesions. Intake of antioxidants and vitamins has also shown to be effective in the treatment. Surgery and cancer treatment is used in extreme cases.

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<sup>13</sup> The WHO defined Arsenicosis as follows: "Arsenicosis is defined as a chronic health condition arising from prolonged ingestion of arsenic above the safe dose for at least six months, usually manifested by characteristic



Arsenic poisoning affects the poorest fraction of society the most, since they often have no alternative drinking water source and are often unable to get proper medical treatment due to financial constraints. Moreover, they are often undernourished, and therefore more susceptible to the disease (Brinkel et al. 2009). Furthermore, financial losses due to catastrophic health expenditures or loss of income exposes them to the risk of falling deeper into poverty.

Socioeconomic studies have indentified various social implications of the disease (Sarker 2010; Hadi and Parveen 2004). Scholars report arsenicosis to be associated with social stigma, which cause problems in the community and in family life. Given the patriarchal social norms and values that prevail in Bangladesh, problems are worse for women, and include rejection from the husband, other family members and the community (Sarker 2010; Sultana 2006).

## 7.2 Barriers to Access for Arsenicosis Patients

In this section, findings from three FGDs in the *upazilas* (sub-districts) of Kalaroa, Sarsa and Hajigonj (see map in Appedix 1) are presented. The aim of the FGDs were to identify barrier to health service utilization for arsenicosis patients. Kalaroa and Sarsa are relatively closely situated, both in the Khulna division in the south-west of Bangladesh. Hajigonj is situated in the Chittagong division south-east of Dhaka. All are rural areas where farming is the main economic activity of the villagers. Three focus group discussions were carried out, each in different upazilas and all including 8-10 participants. Groups consisted of both men and women, of which some had and some had not developed arsenicosis. In order to enable the women to speak more freely about sensitive questions concerning gender issues, the men were asked to leave the group when these questions were brought up.

Longer interviews were also carried out with several professionals who are involved in the arsenic problem in different ways.

The main findings from the FGDs are presented below.

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skin lesions of melanosis and keratosis, occurring alone or in combination, with or without the involvement of internal organs” WHO (2005, p.19)

### 7.2.1 Poverty

Participants in all FGDs and interviews brought up poverty as the main obstacle to seeking medical care. Two sides of the poverty issue became clear during the FGDs. First of all, even though care is often free of charge, the travelling costs and the opportunity cost of losing a day's work often makes the visit unaffordable for poor patients. The other side of the issue was expressed to be that many poor patients felt it useless to seek care, since they felt they would not get well anyway. The reasoning behind this statement comes from the fact that the main medical measurement available to the poor for treating arsenicosis is vitamins, and when patients are undernourished, as the main proportion of the rural poor in Bangladesh are, vitamins have little effect on the disease. Knowing this, many of the ill individuals decided not to seek care.

These findings show on the importance of providing health care within a reasonable distance and cost, but it also shows that if the prerequisites, in this case, nutritious food, are not available, then providing the health care is not a sufficient condition for the patients to actually use it.

### 7.2.2 Distance

Distance was identified as an important barrier to health service utilization. In Sarsa, where a governmental health care complex was situated just outside the village, and all villagers could reach it within five minutes walk, the problems of accessing care were described as few.

On the other hand, in Kalaroa, the closest health care provider was situated 25 km from the village, which is a long way since most villagers do not own a vehicle and the local transportation is considered costly. In this village, time and money costs were identified as key obstacles to accessing health care, and the respondents stated that most people in the village waited until their symptoms had become unbearable until they sought care. The long distance to reach a health care facility was raised as a problem which affected especially women, since they could not be away from the household for a longer time.

Sultana (2006) has conducted calculations of the average time and money arsenicosis patients spend on seeking treatment. The results shows that when including travelling time back and forth, often long waiting time once at the clinic, and time spent for the actual visit, the whole day is often used. Sultana also states the gender differences of this phenomenon: For a man, going to the hospital implies losing a working-day's income, while for a woman, it

means wastage of time, since she needs to leave the household and children unattended (Sultana 2006).

### 7.2.3 Availability and Quality of Care

There were complaints, both from the villagers, NGOs and experts that the government is not putting enough effort in providing adequate health care for arsenicosis patients. While the government has widespread programs for immunization and family planning, no health care program exists for arsenicosis patients (Sultana 2006). These are instead referred to local Upazila Health Complexes or in more severe cases, to District Hospitals. Although there have been some training of diagnosis and treatment of arsenicosis for field health workers, according to the country manager of a local NGO which works with arsenic issues, the quality of this training falls short, which results in that many cases of arsenicosis go undetected and untreated (Sachie Tsushima, 2011-05-02, AAN).

Some of the NGOs which are involved in arsenic mitigation projects are also involved in preventive and to some extent also curative care of arsenicosis patients. A considerable proportion of the respondents in the FGDs had in the past sought treatment –free of cost – from NGO health workers or physicians who had visited their villages. However, some of the NGOs had now reduced their support services, and in general, there was a lack of continuity in these visits.

Several of the respondents in the FGDs manifested frustration and helplessness since the medical treatment available for arsenicosis patients is foremost symptom management, and the only advice that is given from doctors when it comes to treatment of arsenicosis, is to “drink arsenic-free water and eat more vitamins”. This is illustrated in the quotation of an arsenicosis patient below.

*“When I seek care for my respiratory problems, I get asthma medicine, but the doctor does not care about the reason behind the symptoms [arsenic poisoning]”.*

*Female, Hajigonj (2011-04-22)*

Since the patients felt that the doctors could not, or did not help them, they seemed to lose faith in hospitals and therefore, many simply did not go for treatment again.

Even though the patients felt that modern medicine could not help them, it was western medicine that they turned to for treatment. Paul (2006) found that the people connect arsenicosis as a western disease and therefore use western medicine to cure it. The FGDs

confirm this, the use of traditional healers or herbal medicine seemed to be practically non-existent in the study areas. One respondent said that she had tried herbal medicine on her symptoms but since it did not have any effect, she did not try again.

#### 7.2.4 Lack of Knowledge and Education

Treatment-seeking behavior begins with recognition of the illness state, and the measures that should be undertaken are closely connected to ability to understand basic health messages. Providing education and information to individuals, households and communities, is a way of dealing with these informational gaps (Ensor and Cooper 2004).

When arsenicosis first was detected in the 1990s, people frequently confused it with leprosy, which caused isolation of the patients and attached social stigma to the disease (Paul 2006). Since then, information campaigns from government agencies and NGOs have made the public more familiar with the disease, and it has become more socially acceptable.

Since early detection is essential for reversing the symptoms of arsenicosis, it is important that patients get the right diagnosis and receive treatment as soon as possible. Late identification of the symptoms due to lack of knowledge or stigma, leads to delay in seeking health care.

Professionals concerned with arsenic state that the awareness about arsenic issues among villagers is today relatively high (Sachie Tsushima, AAN 2011-05-02; Abbas Bhuiya, ICDDR,B 2011-04-26). However, social stigma is still attached to the disease, especially when it comes to women. They fear not getting married if they reveal their disease. All these factors risk delaying treatment seeking.

In the FGDs, most participants generally demonstrated good knowledge in the causes of arsenicosis and that drinking contaminated water needs to be avoided in order to avoid the adverse health effects of arsenic exposure. Some participants in the FGDs also demonstrated good knowledge of arsenicosis control, in raising the importance of eating nutritious food and vitamins in order to stand a better chance of getting cured from the disease.

However, there were some evidence of confusion and lack of clear understanding of the disease. For example, knowledge regarding symptoms associated with arsenicosis seemed to vary. Many patients confused the early symptoms with other skin-related diseases. This is illustrated in the following quote from a male arsenicosis patient.

*“First I thought the scratches on my skin were caused by insect bites or by the tools I use when working in the field. I did not understand that they were symptoms of arsenicosis until some researchers came to the village and told me I should get a proper examination”*

*Male, Kolaroa, (2011-04-16)*

It was also clear that some community members found health problems due to consuming arsenic-contaminated water rather abstract concepts and difficult to understand, since the water they drank appeared to be of better quality than much of the alternative water sources. Arsenic is treacherous, since it has no taste, smell or colour. Other respondents indicated that they boiled the arsenic-contaminated water in the belief that it would purify it. However, since arsenic is a heavy metal, boiling the water does not remove the arsenic.

These findings confirm that there is still an awareness gap in the public. Perhaps the informational campaigns have not been sufficient, or perhaps the individuals have failed to assimilate these messages, due to lack of education or literacy.

### 7.2.5 Community and Cultural Preferences

Socio-cultural forces including family and community attitudes are strong in Bangladesh, where tradition and religion are very important parts of society. As has been pointed out in various parts of this thesis, existing socio-cultural norms tend to privilege the needs of men over those of women, and pose barriers to women in accessing treatment.

In the FGDs the female participants were asked about how they perceive their roles within the family and community, and what consequences this had on their care-seeking behaviour. Interestingly, the picture was not fully uniform; in fact it varied considerably between different villages.

In Kalaroa, gender roles were described as highly traditional. The husband was described as the bread-owner and the wife as responsible for the household and the children. The women felt they could not leave the household even if they wanted to, because doing so meant leaving their children unattended. The women were also not allowed to travel by themselves to the health care facility, as they must always have a male relative to accompany them, thus implying double transportation costs for the household when a woman seeks care. Various examples also emerged of women that could not seek care when they needed to, because their husbands had opposed it.

In Kalaroa, the women were also expected to subordinate their own needs to the needs of other family members in determining priorities for resources given to health care, causing intra-household inequity in access to care. This is exemplified in the following quote from a woman:

*“A wife should care for her husband and her children, and is therefore expected to place herself last on the list of receiving health care. Also, a wife is financially dependent on her husband, and therefore she has an interest in caring for his health and ability to work”*

*Female, Kalaroa, (2011-04-16)*

Moreover, the lack of female health workers in hospitals and health complexes was described as an important obstacle to seeking care for these women. They hesitated in seeking health care of fear of being examined by a male doctor, which was seen as inappropriate.

However, in the other study sites, another, contrasting picture emerged. In both Hajigonj and Sarsa, the women stated that they did not face any gender-related problems in accessing health care. They did have to ask for their husband’s permission before visiting the health care complex or hospital, but he always allowed them to leave the house when they needed.

In Sarsa, there were female health workers at the health complex, and therefore the women were not worried about being examined by a man. In Hajigonj, the female participants stated that since problem with arsenicosis was common in the village, the social acceptance of the disease had become relatively high, which resulted in them not hesitating to see a male doctor for their problems.

Moreover, a more equal way of seeing the gender roles within the family when accessing health care was also present in these *upazilas*. When the women in Hajigonj were asked about who was prioritized for receiving health care within the household, the answer was that the children’s health was always first priority, then came the wife and the husband at equal positions.

## 8 Reflecting Over Barriers to Access for Arsenicosis Patients –the Case of Satellite Clinics

In Chapter 7, various access barriers to health service utilization for arsenicosis patients were identified. In light of these findings and earlier research, it becomes clear that policy-makers must look beyond the provision of health care in order to overcome these barriers and meet the needs of socially and economically weak groups. So far, little attention, both from policy-makers and researchers, has however been given to possible solution of minimizing access barriers for arsenicosis patients. Instead, most government planning models are supply driven, with staff size and capacity of facilities being main determinants.

In this chapter, we look at one interesting initiative that has come up from a Bangladeshi company, which with a service delivery model of satellite clinics possibly could minimize some access barriers of arsenicosis patients.

### 8.1 The Satellite Clinics Project

A Bangladeshi nutraceutical company has since 2007 operated a pilote project of a new service delivery model, which relies on satellite clinics, with the aim to provide health care to arsenicosis patients in rural Bangladesh. It has developed two nutrient based products for arsenicosis treatment: one ointment for treatment of external symptoms, and one antioxidant capsule which is used to neutralize the accumulated arsenic inside the body. The future of the project relies on financial support from the government of Bangladesh or international and national donors.

The organization is built around a so-called base clinic, which consists of a van that visits several rural villages, where it builds up temporary satellite clinics. One satellite clinic has approximately 500 patients and one base clinic has five satellites. A mobile medical team consisting of one physician and one nurse is tied to the clinics. The team travels with the van to the affected villages and installs the satellite clinic in a villager's house or a common area.

Prior to the visit of the medical team, an awareness worker, which is often recruited among the villagers, provides the villagers with information about the visit times of the medical team, as well as on measures on how to avoid arsenic poisoning. The medical team circulates from village to village and re-visits the villages approximately two times monthly for follow up. If a patient is diagnosed with arsenicosis, the physician provides the patient with medicine as well as restrictions on how to use it and how to avoid another illness breakout. Both the visit and the medicine were in the pilot-project provided free of charge. In the future it is however not clear what the payment scheme will look like.

## 8.2 Why Use Satellite Clinics?

Satellite, or mobile health clinics are sometimes mentioned as a possible solution to overcome barriers to health care access, especially for otherwise hard-to-reach patients. Mobile provision has been introduced for a number of health services in other parts of the world, including mammography, (Skinner et al. 1995), child monitoring (Van der Pol and Varwijk 1998) and in Bangladesh, for family planning services and immunization (Ruth et al. 2007). As Vos et al. (1990) points out, while there are some evidence on increased access to services in rural areas, when costs of staff time and transport are included in the analysis, in some cases the costs exceed that of static clinics. In those cases, the costs should be weighed against the positive effects of increased outreach (given that mobile provision *does* increase utilization).

It is important to point out that this chapter is not intended to be an evaluation of satellite clinics as a health care delivery model. In order to do that, a full-fledged cost-effectiveness analysis would be needed. That kind of analysis would require calculations of various cost factors, including direct price and transportation costs, the opportunity cost of time of patients and staff, etc. It would also require a comparison of the usage level of health services for arsenicosis patients when the satellite clinics are present, against the usual pattern of health care use for these patients.

In the absence of evidence on effectiveness and costs, the findings from the FGDs in this chapter used to discuss some advantages, mainly from the patients' point of view (i.e. the demand side), for using satellite clinics for the provision of health care to arsenicosis patients. As mentioned before, the FGDs identified time and distance as significant barriers to accessing health care, especially for women. Bringing the services to the door-step of the



patients, as do satellite clinics, has a strong potential of overcoming these barriers. The strategy is particularly advantageous in targeting women, who generally have little possibility of leaving the household unattended for a longer time. Furthermore, taking account of the characteristics of arsenicosis; it is slow in its manifestation of symptoms and requires continuity in the treatment and follow-up over a long period of time, it seems reasonable to assume that patients far away from health facilities will not be able to meet this continuity. If health services instead are provided in the village in which the patients are residing, these do not have to include distance and time costs into the decision-making calculations of whether to seek care or not.

Poverty was in the FGDs stated as the most acute barrier to health care utilization for the patients. Even though poverty is assumed to be mainly affected by economic policies outside the specific control of the health sector, some features of health interventions can certainly affect the accessibility of care for patients with low purchasing-power. Given that consumers face the same prices of care for satellite and static clinics, satellite clinics minimises household costs of utilising care, since there is no need to spend money and time on travelling to a health facility.

Working with awareness-raising activities has been shown to be an important policy measure for increasing the demand for health services (Ensor and Cooper 2004). In the arsenic issue it has been shown to be particularly important, as it is essential that the patients not only understand the importance of seeking treatment at an early stage, but also undertake specific measures, such as avoiding arsenic-contaminated water. The findings from FGDs and interviews with NGOs in this thesis indicate that the measures taken by the Bangladeshi government and NGOs in raising awareness of the arsenic issue has so far have not been sufficient. The FGDs show that even though the general level of knowledge is relatively high, awareness gaps still exists. Therefore, increasing awareness-raising activities is important. Stressing the importance of proper treatment and raising the different treatment options are therefore measures that need to be undertaken to a larger extent. Integrating awareness raising activities with the provision of health care, as in the model of satellite clinics presented here, is a particularly good idea. This could stimulate demand for health services, as well as it could inform people of the importance of drinking arsenic-free water, etc. Bringing the clinics to the door-step could also possibly mean reaching out to persons with low awareness who do not fully understand the importance of seeking care, and therefore would not have sought care at their own initiative.

Cultural norms were in the FGDs shown to be an important barrier for women in accessing care. Even though the findings indicate that the extent of these barriers can vary significantly between different locations, it is a fact that many women in Bangladesh still live oppressed lives, and in order for health interventions to be effective, they need to be gender sensitive. Measures such as providing female health care workers, especially in areas that are known to be highly traditional, are in this context important. Also, *assuring* that the females should be examined by a female doctor is also important, since the fear of facing a man once at the health clinic, could significantly delay, or even impede care seeking. Satellite clinics could be an adequate supply side response to these kinds of demand side barriers. Delivering services within the community could be a way of overcoming social objection to women obtaining care outside their homes. This has been the case in family planning services to rural households in Bangladesh (Ruth et al. 2002).

Availability and quality of care were also stated as reasons for not seeking care. The community was not satisfied with the quality of the provision of care at the local governmental hospitals and health complexes. Providing services with the specific aim to target arsenicosis patients with knowledgeable health care workers could affect the decision on whether to seek care or not among these patients.

## 9 Conclusion

This thesis puts a gender perspective on health service access and utilization in rural Bangladesh. Econometric methods are used to identify determinants of health service utilization in general, and a qualitative study is conducted to address access barriers to health care among arsenicosis patients in particular. While quantitative measures can answer a “how often” type of question, qualitative measures can explain “why something is happening”, and these two methods are thus complementary to each other (Ahmed 2005).

Various interesting results emerge regarding health seeking behaviour and gender in this thesis. First of all, even though the prevalence of illness was practically the same for males and females (around 37 %), females sought significantly less care than their male counterparts (62 % of the males but only 48 % of the females reported having sought care). Similar findings for Bangladesh have been reported elsewhere (Ahmed 2005, Ahmed et al. 2000). The econometric results confirm this relationship: even when controlling for factors such as age, literacy and type of illness, females are 50 percent less likely to seek care, compared to their male counterparts. This finding is strongly significant ( $p < 0.000$ ).

In the FGDs, some barriers that women face to seeking care, and that could possibly explain why women seek less care, were identified. Even though these findings apply for arsenicosis patients in particular, it is reasonable to assume that a similar pattern exists for other types of ill health. Prevailing patriarchal norms which tie females to the household and discourage them to be treated by male providers were described in FGDs. However, this was true particularly in one of the study areas. In the other two, less constraints were put on women for seeking care. These differences in the FGDs could of course be due to random geographical differences, and since the study only includes three study sites, no generalizations of the results can be made to Bangladesh as a whole. However, some recent studies indicate that gender norms are to some extent being redefined in Bangladesh (Ahmed 2005, Ruth et al. 2002) For example, Ruth et al. (2002) found that the custom of physical seclusion of women (called *purdah*) that used to be frequently seen in Bangladesh some decades ago, is not seen as often anymore. Ahmed (2005) highlights an increased labour-force participation of women and increased NGO and governmental activities that promote female empowerment as explanations for these changes. In light of this, it should be kept in

mind that the data set used in this study dates 15 years back, and thus does not capture this supposed change in women's empowerment. If a more recent data set would have been used, the gender bias in health service utilization which was observed in this thesis might not have been as strong.

Apart from gender, a number of other determinants of seeking care in the context of multiple provider choices emerged from the regression analysis. One finding is that non-poor and literate individuals are more likely to seek qualified care, compared to poor and illiterate ones. Moreover, residing in a household with a female head, significantly increases the probability of that individual utilizing qualified health care. This is an interesting finding which supports the hypothesis that female household heads direct more resources to health care than male heads of household.

Moreover, various access variables emerged as significant and an interesting pattern of these is revealed. Firstly, as have been shown in various other studies (Hjortsberg 2003; Field and Briggs 2001), if access barriers are high, the probability of an individual seeking care decreases. However, what has not been shown in other studies is that if an access barrier increases for one type of practitioner, the propensity to seek care from another type increases. This finding is an indication of the different types of providers being substitutes to each other. Interestingly, even qualified allopaths and traditional providers seem to be substitutes. These findings not only show on the importance of access barriers for health service use, but there are also indications that the decision of which type of provider to use could be more determined by access variables of these providers, and less by the characteristics of the provider per se. More research is however needed on access barriers and different types of providers in order to get a more comprehensive picture of these relationships.

Various policy implications can be drawn from the results. Some are specific for arsenicosis patients and some are of more general character and are valid for the health care in Bangladesh in general. First of all, more gender sensitivity in the provision of health care is needed, both when providing care to arsenicosis patients and to other types of illness conditions. Increasing the workforce of female health workers is an important first step. Available health care providers are today predominantly males in Bangladesh (Ahmed et al. 2006), and as was found in the FGDs and as has been reported elsewhere (Hossen and Westhues 2011), religious and cultural norms commonly prevent women to seek care from a male doctor in Bangladesh. Even though there are indications of that the situation is changing, this happens slowly since gender norms are deeply rooted in society, this issue is still highly relevant to address (Ahmed 2005). To continue with policies that lies outside the

scope of health promotion, but that aim at promoting gender empowerment is important to assure the continuation of this positive trend. In a study from Bangladesh, Ahmed et al. (2003) found that economic empowerment activities such as women's micro credit, life-skill training and non-formal education, improved women's access and control over resources mediated through increased mobility and autonomy of health decision making within the household.

From a health policy perspective, it is also important to stress that many access barriers that apply to both men and women, are intertwined with gender inequality, and thereby impose a greater barrier to women than to men. For example, distance has both in the FGDs and in previous studies emerged as is a larger concern for women than for men in Bangladesh, since cultural and religious guidelines restrict the mobility of females (Hossen and Westhues 2001).

Furthermore, an appropriate strategy for health care in Bangladesh requires serious consideration of the informal/private sector. This sector, which largely consists of untrained practitioners, is much more commonly used than the public sector (Hossen and Westhues 2011). Providing formal training for these unqualified practitioners could increase the quality of care received by the rural poor (Hossen and Westhues 2011).

Indeed, in this study, the most common therapeutic measure undertaken by both among men and women was the use of paraprofessional practitioners, of which village doctors and drug vendors who commonly have no or very little formal training, were the largest groups. 38 percent of the ill females and 54 percent of the ill males sought care from paraprofessionals. This can be compared to solely around 6 percent for both gender groups that sought qualified allopathic care. Similar patterns have been reported in other studies in Bangladesh (Ahmed 2005, BHW 2007). The low use of qualified practitioners could be a response of informal charges by public physicians, lack of quality, or high rates of absenteeism of doctors and nurses. All these are well-known problems of the Bangladeshi public health care, and they are likely to discourage people from seeking care at these facilities (Hossen and Westhues 2011; Ensor and Cooper 2004). Thus, concerns improving the quality of public care is an emergent policy concern.

Moreover, poverty appears as a main obstacle to seeking care, both in the regression analysis and in FGDs. The importance of poverty on health service utilization in a developing country setting has also been widely reported in earlier studies (Ahmed 2005; Hjortsberg 2003; O'Donnell 2007). Today, health service utilization is financed by out-of-pocket by the poor, and they therefore have no protection against catastrophic health expenditures. Some kind of pre-payment mechanisms which pool risks across individuals therefore desirable.

Research from other development countries shows that having a health insurance is positively correlated with utilizing health care (see Hjortsberg 2003 for evidence on Zambia and Jowett et al. for evidence on Vietnam).

In light of the FGDs, a number of policy measures to reduce access barriers for arsenicosis patients can be pointed out. Poverty, distance, availability and quality of care, lack of knowledge and education as well as community and cultural preferences were factors that all were said to impact health service utilization. In overcoming these barriers, a gender-sensitive approach must be taken on. More awareness-raising activities are also needed, as well as an improvement of the quality of care and further education for health workers on specific arsenic-related issues. The discussion about satellite clinics held in Chapter 8 of this thesis is descriptive and does not include any evidence of the effectiveness of such intervention. However, it has some potential features for overcoming access barriers, the most powerful being the reduction of distance to care. More research on using satellite clinics for arsenicosis patients, as well as for other kinds of health care provision, is however needed in order to draw any further conclusions for policy implications.

In conclusion, this thesis has provided evidence of a gender bias in health service utilization in Bangladesh, and it has been shown that gender constraints poses access barriers on women, these might however be declining in power. Moreover, Bangladesh faces a number of health care sector challenges, such as high utilization rates of unqualified practitioners, insufficient quality of care and no protection against catastrophic health expenditures. Furthermore, it is shown that arsenicosis patients do not receive the health care that they need, and more attention should therefore be put on meeting those needs.

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#### Interviews

Sachie Tsushima, Country Manager, Asia Arsenic Network (AAN), 2011-05-02

Abbas Bhuiya, Head of Poverty and Health Programme ICDDR,B, 2011-04-26

#### Focus Group Discussions

Kalaroa, 2011-04-16

Sarsa, 2011-04-16

Hajigonj, 2011-04-22

Appendix 1. Map of Bangladesh with study sites

Study sites:  
A: Matlab and Hajigonj  
B: Kalaroa and Sarsa

