CHAPTER II

LITERATURE REVIEW

A comprehensive search in MEDLINE was conducted using the following key words tuberculosis, delay, help seeking behavior, gender, sex, equity, equality, justice, private sector, traditional healer, and Nepal. In addition, a library search was carried out.

2.1 Tuberculosis

TB is primarily an airborne disease. The disease is spread from person to person in tiny microscopic droplets when a TB sufferer coughs, sneezes, speaks, sings, or laughs. Only people with active disease are contagious. It usually takes lengthy contact with someone with active TB before a person can become infected. On average, people have a 50 percent chance of becoming infected with M. tuberculosis if they spend eight hours a day for six months or 24 hours a day for two months working or living with someone with active TB. However, people with TB who have been treated with appropriate drugs for at least two weeks are no longer contagious and do not spread the germ to others. Adequate ventilation is a very important measure to prevent the transmission of TB.

Table 1: Male: Female ratio of smear positive TB notifications, by age group and WHO region

WHO region	Age group (years							Total
	0-14	15-24	25-34	35-44	45-54	55-64	65+	
Africa	0.84	0.94	1.28	1.73	1.95	1.87	2.04	1.35
Americas	0.84	1.22	1.39	1.65	1.84	1.87	1.58	1.49
South-East Asia	0.60	1.33	1.66	2.39	2.90	3.08	3.15	2.03
Europe	0.78	1.34	1.81	2.97	4.27	2.97	1.22	2.16
Eastern Mediterranean	0.92	1.25	1.51	1.49	1.46	1.36	1.40	1.37
Western Pacific	0.78	1.40	1.78	2.27	2.54	2.51	2.48	2.09
Total	0.78	1.18	1.50	2.06	2.45	2.48	2.36	1.74

Source: WHO (2004b). Global tuberculosis control: surveillance, planning, financing. WHO report 2004. Geneva. World Health Organization

In WHO's South-East Asia Region, nearly 3 million cases and 700,000 deaths occur every year; nearly 40% of the world's TB patients live in the South-East Asia Region. TB kills more than 2000 people every day in the South-East Asia Region. Five countries -- Bangladesh, India, Indonesia, Myanmar and Thailand -- account for 95% of these deaths. This morbidity and mortality occur mainly in the economically productive ages between 15-60 years, directly affecting the nations' economies. The situation is likely to be further complicated by the rapidly expanding HIV/AIDS epidemic and the emergence of multi drug resistant strains of TB. Moreover, tuberculosis is the largest single infectious cause of women's deaths the SEA Region. TB has been identified as one of the topmost public health problems in this region. The situation is likely to be further complicated with the rapid spread of HIV and emergence of drug resistant TB strains in the region. Nearly 60% of AIDS cases develop TB indicating that the latter is the most common life threatening opportunistic infection associated with HIV (Narain, 2002; WHO, 2004a).

2.2 Nepal country profile

Nepal is a low-income country in Southeast Asia, with an area of 147,181 square kilometers. Its neighboring countries are India and China. The mountainous landlocked country of Nepal has a remarkably rich diversity of geography, culture, language and people. About 85% of the population is Hindu. The official language is Nepali. Nepal has three geographical regions running parallel east-to-west; mountains, hills and plains. Administratively, the country is divided into five development regions with 75 districts. Infrastructure and communications are poorly developed. The economy is based on tourism, carpets and textiles, and there is considerably potential for hydroelectric power (The Central Bureau of Statistics [CBS], 2001).

The national population and housing census conducted on 2001 reported the population of Nepal at 23 million (49% men and 51% women). The population density in the same year was 158 persons per square kilometer. 13.9% of the population lived in urban areas. Urban population growth rates (3.44%) are some of the highest in the world. Approximately 86% of the population lives in rural areas and majority are farmers with incomes reliant upon subsistence agriculture. Rapid change has had a disruptive effect on social structures. Urban migration to Kathmandu, the capital city, has led to serious problems of congestion, land shortage and water and air pollution. The life expectancy is 61 years. Infant mortality rate per 1,000 is 64.4 in the year 2001. About 42% of the population is below poverty line in the year 2001 (CBS, 2001).

2.2.1 Health care delivery systems

Government of Nepal (GoN) is committed to improving the health

status of the people of Nepal through provision of an equitable and quality health care delivery systemfor the Nepalese people. Towards this aim, and in line with the Poverty Reduction Strategy Paper, Millennium Development Goals and the 10th plan (2002-2007), GoN has formulated the Health Sector Strategy: An agenda for Reform 2003 (The Nepal Health Sector Programme- Implementation Plan, MOH 2004).

Health care delivery remains largely the responsibility of the Ministry of Health, although the non-governmental organizations (NGOs) are increasingly providing health services, particularly in the urban areas of the country. The Ministry of Health has three departments, the Department of Health Services, the Department of Drug Administration and the Department of Ayurveda (traditional system of health care).

There are five levels of health care delivery within the Department of Health Services. They are; i) Sub-health Post and Health Post, ii) Primary Health Care Centre, iii) District Hospital, iv) Zonal, sub-regional and Regional Hospital and v) National Hospital. The Sub-health post, health post and primary health care centres are the primary health care units, while the district, zonal and sub-regional hospitals and regional hospitals are the secondary referral units, the national hospitals are the tertiary level of health care.

2.3 Epidemiology of TB in Nepal

2.3.1 Exposure to tuberculosis Infection

There are four risk factors that are important to tuberculosis infection: 1) population density 2) climate 3) family size and 4) age of the infection source. The population density is 145.6 people per square kilometers in Nepal, and therefore this factor contributes greatly to an increasing risk of TB in Nepal. The climate does not

contribute greatly to increase the risk for the infection. The family size is large, 5-7 persons, mostly living in crowed conditions. The poor urban population is increasing; 80% of urban population is estimated being under the poverty line. Also the migration from rural to urban areas is increasing. The age of the source of infection, namely infectious TB cases, is concentrated in younger age groups both in males and females so that the sources of infection remain in the society for a long period. The largest number of infectious cases is in the age group of 15-24 years (NTP, 2004). The last two risk factors play a significant role in tuberculosis infection in Nepal.

2.3.2 Tuberculosis Infection

About 60% of adults and 45% of the general population have been infected with the disease. A number of tuberculin surveys have been undertaken in various districts of Nepal; summarized in the five year plan of TB Control. Estimated average annual risk of infection from these surveys varies from less than 1% in the mountain areas, 1.5% in the hills, 2.5% in the plains and 4% (Kathmandu area) in the urban areas (MOH, 2004; MOH/NTC, 1994).

2.3.3 Risk factors for Tuberculosis disease

The highest risk factor for tuberculosis disease is the HIV infection. The HIV infection has not yet played a significant role in Nepal, but it is expected to increase. Both neighboring countries, India and China, already have a large HIV problem. The number of AIDS cases has slowly increased in Nepal. In 2001, the total numbers of AIDS cases were 516 whereas 4 cases in 1988 (Department of Health Services [DoHS], 2003). Three rounds of surveillance of HIV in people with TB have been conducted. In 1994, HIV prevalence in TB patients was 0%, in 1996 was 0.6% and in 1998 was 1.8% (MOH, 2004). The results indicate that the prevalence of HIV

is low but increasing. The National Centre for AIDS and STD control shows a recent increase in rates of HIV in commercial sex workers and injecting drug users. HIV and TB dual infection could become a very serious problem in the future.

2.3.4 Tuberculosis Morbidity

There are unfortunately several favorable conditions for the spread of TB in Nepal. One is the rapid population growth rate, which is now around 2.24% per year (CBS, 2001). Second is the presence or a large population of refugees, about 130,000 populations in Nepal. As in many other countries, TB incidence is higher in refugees than in the stable population. Poverty is also strongly associated with TB. The number of people living in poverty is large 80% of urban people and 70% of rural people fall under the poverty line according to recent estimates (CBS, 2001). Both the instability and poverty has led to migration from rural to urban areas. All these facts are influencing the spread of TB. The expected number of all forms of tuberculosis cases in Nepal is around 44,000: out of them around 20,000 are new smear positive cases. The actual notified tuberculosis cases have been steadily increasing.

Table 2: Evolution of case finding in Nepal

Year	Population	Estimated cases ARTI=1.8%	Actual N+ve	DR
1995	19,722,621	17,750	10,104	56.9
1996	20,320,811	18,289	10,348	56.5
1997	20,919,000	18,827	10,620	56.4
1998	21,517,189	19,365	11,306	58.3
1999	22,130,652	19,918	12,144	60.9
2000	22,706,049	20,435	13,446	65.8
2001	23,151,423	20,826	13,683	65.7
2002	23,902,112	21,512	13,714	63.7
2003	24,523,567	22,071	14,348	65.0
2004	24,516,402	22,064	14,614	66.2

Source: National Tuberculosis Control Programme. Annual report 1995-2004.
Note: CF: Case finding., N+ve: New smear positive pulmonary TB, DR: Detection rate, ARTI: Annual Risk of TB Infection

This represents the remarkable progress in the expansion of case finding activities in view of the substantial obstacles which had to be overcome and represents a commendable commitment on the part of both the government and the personnel responsible for undertaking the task. Sputum smear positive patients are mainly relatively young adults, predominantly male, enabling them to seek care at relatively remote central locations in large institutions lying in big cities like Kathmandu.

The peak of new smear positive cases is in the age group of 15-24 years, the second highest in the age group of 25-34 years, most productive age groups of the society. There is a gender difference in notified TB cases. In the notified TB cases the male:female ratio is nearly 2:1.

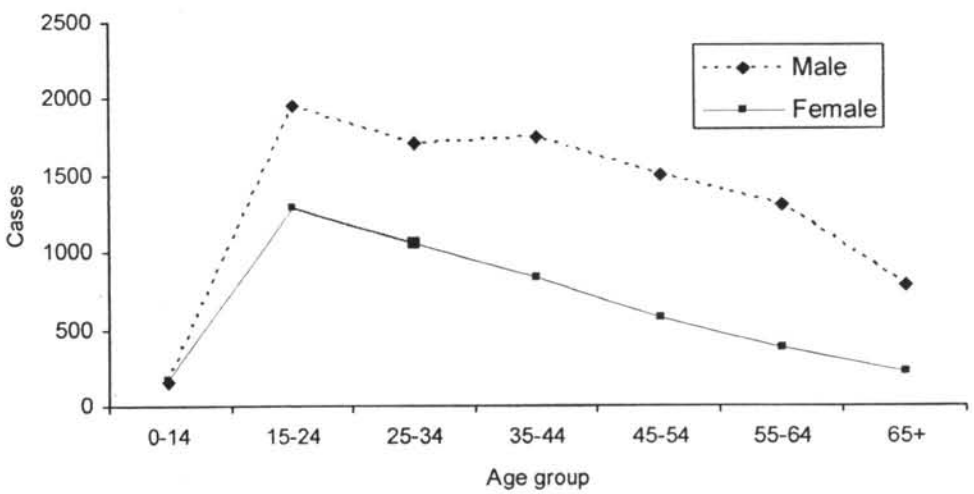

Figure 5: Distribution of new smear positives (n=13, 683) by age and sex
Source: National Tuberculosis Control Programme, Annual Report 2001

2.3.5 Mortality

According to the vital statistics, TB is among the ten leading causes of

mortality. The official statistics of reported mortality show a rate of 0.7 per 1000 in 1995 and 1996. NTP, statistics show that mortality in TB is 8-11%. Case fatality rate among the reported new smear positive cases was 1.6% in 1995, 2.3% in 1996, 3.1% in 1997, 3.3% in 1998, 4% in 1999 and 5% in 2000, respectively (MOH, 2004).

2.3.6 Treatment result

The national treatment success rate is improving after the implementation of DOTS in 1996. It has been achieved and sustained over 80% since the very beginning of DOTS implementation in Nepal (NTP, 2004).

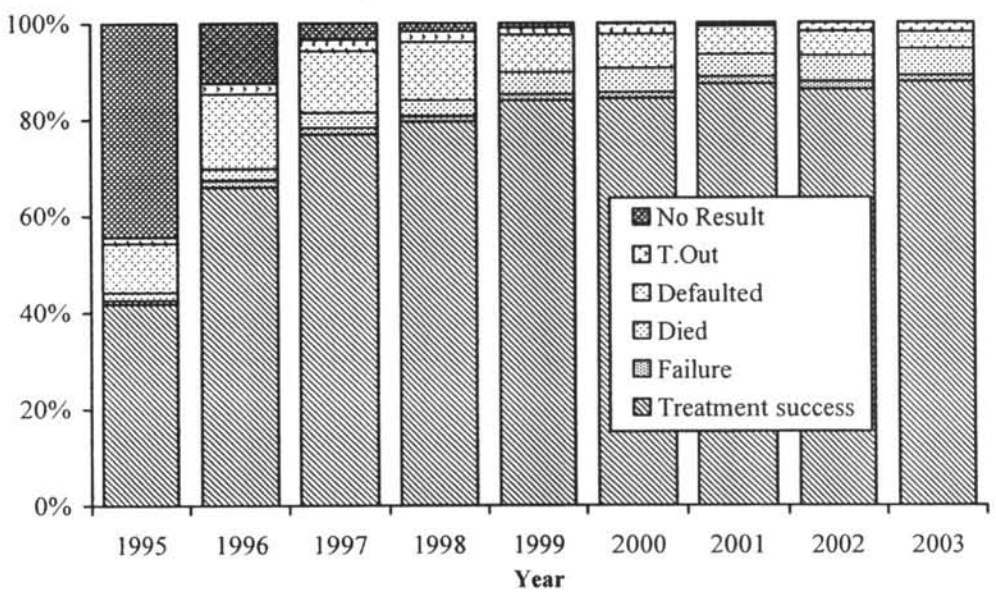

Figure 6: Treatment Outcome Results, 1995-2003

Source: National Tuberculosis Control Programme, Annual Report 1995-2003.

2.4 Delay in initiating tuberculosis treatment and its impact on the community

Most of the countries in the world now apply passive case-finding approach for TB detection. The term passive case finding used here describes such methods for the identification of TB cases where the initiative for an individual patient-health

provider contact is taken by the patient (Rieder, 1993). In most low and middle-income countries about two-thirds of reported TB cases are men and only one third women (WHO, 2000), this ratio (male : female) in Nepal was 2:1 (NTP, 2003), and it is not well known that whether this is due to a higher risk of developing TB among men or under notification of TB among women. Analysis of TB notification history suggests the possibility that cases of TB among women are being under-reported in developing regions (Holmes et al., 1998).

The principal reservoir of infection in the community might be the patients with undiagnosed tuberculosis. Delays in the duration between the onset of symptoms (and by proxy the onset of infectiousness) and the start of appropriate treatment will increase the risk of transmission. The contagion parameter suggests that where TB is endemic, each infectious case will result in between 20-28 secondary infections. Strategies aiming to reduce the time between the onset of symptoms and the initiation of effective chemotherapy may impact the infectious duration in the community and thereby reduce the number of new infection. Late diagnosis of pulmonary TB is likely to be associated with a worse prognosis owing to the presence of extensive disease and poor clinical condition. Additionally, and of particular importance from a public health perspective, delay in treatment for active tuberculosis is likely to be associated with a greater number of secondary cases per index case (Styblo, 1991). Research has shown that delay in diagnosis may worsen the disease, increase risk of death and enhance tuberculosis transmission in the community (Olumuyiwa, 2004). One study presented that the duration of symptoms at presentation to medical services varied from 4 days and 3 years, with a median of 2 months for patients of both sexes. They believed that they had malaria or pneumonia, depending on their symptoms

(Eastwood & Hill, 2004). Patients have complex patterns of care seeking behavior that cause diagnostic delay, involving traditional healers, pharmacies, private doctors and health centres. Published studies have shown that some patients use traditional methods and medical services simultaneously, and use more than one traditional healer before presenting to medical services (Eastwood & Hill, 2004).

One of the main objectives of any TB Control Programme is to reduce tuberculosis transmission in the community through early detection of tuberculosis cases and prompt implementation of DOTS. This is particularly important in the case of untreated smear positive patients who are the main sources of infection in a community (Enarson et al. 1996). Delay in diagnosis and start of effective treatment of tuberculosis patients result in a prolonged period of infectivity in the community and health care workers (Mathur et al., 1994). A study showed that 40%-50% death rate occurred for patients admitted to the intensive care unit. This study suggested that a delay in diagnosis and institution of appropriate anti-tubercular therapy are important predictors of mortality for patients with pulmonary tuberculosis (Paolisso & Leslie, 1995).

Long delay to TB diagnosis has adverse effects on the patients; their family members, and society, as well as TB control in general (Mathur et al., 1994). In another study, it has been reported that delay in the detection of TB was the main factor contributing to the death of TB patients (Zafran et al., 1994). A study in Australia on diagnostic delay and transmission of TB in an office concluded that delay in diagnosis was the major factor responsible for the spread of TB in the studied office (MacIntyre et al., 1995). Long diagnostic delay among women have even more adverse effects as the health and welfare of children and other family members is

closely linked to that of the mothers (Hudelson, 1996). Therefore, reducing delays in TB help seeking and diagnosis is especially important among women.

There are number of delays in help seeking and diagnosis of TB and start of treatment. "Delay to first health provider" is the time interval from onset of symptoms to the first presentation to any health care provider, including self medication. "Patient's delay" is the time interval from onset of symptoms to the first visit to a hospital or a doctor or a formal public health facility where TB diagnosis is available. "Doctor's delay" or "health care personnel's delay" is the time interval from the first visit to a hospital or a doctor or a formal public health facility to a TB diagnosis. "Total diagnosis delay" is the time interval from onset of symptoms to TB diagnosis. "Treatment delay" is the time interval from diagnosis to the start of treatment. "Total treatment delay" is the time interval from onset of symptoms until the start of treatment. "Health system delay" is the time interval from the first visit to any type of provider to the start of treatment.

Delays in health care seeking and TB diagnosis, as well as in initiating appropriate treatment have been addressed by a number of studies in different countries. The proportions of patients' and providers' delays, respectively, among total delays are different between settings. Studies suggest that the pattern of different delays is affected by country's geographical, socio-economic, demographic, socio-cultural and health systems.

Table 3: Delays in help seeking of and tuberculosis diagnosis

Place	Measurement	Patient delay	Doctor's delay	Diagnosis delay
Bostswana (Steen & Mazonde, 1998)	Mean	5.1 wks	12.2 wks	17.3 wks
Ghana (Lawn et al., 1998)	Median	4 wks	8 wks	4 mths
Malaysia (Liam & Tang, 1997)	Median	2 wks	7 wks	12.5 wks
Korea (Mori et al., 1992)	Mean	80% of total	20% of total	2 mths
Tanzania (Wandwalo, 2000)	Mean	162 days	23 days	185 days
	Median	120 days	15 days	136 days
New York City (Sherman et al., 1999)	Median	25 days	15 days	57 days
Vietnam (Long et al., 1999)	Mean	7.7 wks	4.2 wks	11.9 wks

Delay from onset of symptoms to treatment initiation from several studies

Place	Measurement	Patient delay	System delay	Total delay
Nigeria (Odusanya O. O. et al. 2004)	Mean	12.3 wks	2.1wks	14.3 wks
Vietnam (Long et al. 1999)	Median	7.7 wks	11.9 wks	11.9 wks
New York, USA (Sherman et al. 1999)	Median	3.5 wks	2.1 wks	8.1 wks
Vietnam (Lonnroth et al. 1999)	Median	3.0 wks	7 wks	9.9 wks
California USA (Asch et al. 1998)	Median			10.5 wks
Tanzania (Wandwalo, Morkve 2000)	Median	23 wks	3.2 wks	26 wks
Gambia (Lienhardt et al. 2001)	Median	0.7 wks	10.6 wks	11.5 wks
South Africa (Pronyk et al. 2002)	Median	4 wks	2 wks	
Zambia (Needham et al. 2001)	Mean			9 wks
Ethiopia (Demissie M et al. 2002)	Mean	78.2 days	9.5 days	88 days

2.5 Gender

Broadly, gender is "what it means to be male or female, and how that defines a person's opportunities, roles, responsibilities and relationships" (WHO, 2004). There is an important distinction between sex and gender as terms for describing differences between men and women, and role of gender as a determinant of health status.

Specifically, sex is genetic/physiological or biological characteristics of a person which indicates whether one is female or male (WHO, 2004). Gender on the other hand refers to those distinguishing features that are socially constructed. Gender influences the control men and women have over the determinants of their health, for example, their economic position and social status, and their access to resources. Gender configures both the material and symbolic positions that men and women occupy in the social hierarchy, and shapes the experiences that condition their lives (WHO, 2004). Gender is a powerful determinant of health that interacts with other variables such as age, family structure, income, education, and social support, and with a variety of behavioural factors. These gender divisions shape the lives of both women and men in fundamental ways. As individuals with particular identities and as member of the society they are shaped and reshaped by their femaleness or their maleness. In one sense then, both women and men are constrained by their membership of particular gender group. But these variations represent more than just a difference. In most societies they are also used to justify major inequalities with those in the category female having less access than those in the category male to a wide variety of economic and social resources like obvious inequality in the distribution of income and wealth, around the world as well as in the Nepal, women make up about 70% of those who are poor (United Nation Development Programme [UNDP], 1995), unequal situation in the labour market, less favorable treatment in most social security systems, many have no access to independent income and those who do earn their own wage receive on average around three quarters of the comparable male salary (UNDP, 1995).

Devaluation of femaleness is a significant element of everyday thinking in many societies (Ussher, 1989). The cultural discrimination is expressed by low status within the household, the relatively low value placed on women and girls by individual families and by society as a whole. Women still outnumber men by two to one among the world's illiterate people and girls constitute the majority of the children without access to primary school (UNDP, 1995). Women's access to political and economic power is not also balanced with their number and contributions as citizens and in some countries these gender inequalities in power continue to be reflected in the discriminatory nature of the law.

Traditionally, women have had to face much greater health risks; confront many more constraints and make do with much fewer opportunities in trying to resolve their health needs than men (WHO/TDR, 1996). Gender also plays a role, however, in men's health problems- their proneness to accidents, addiction and violence for instance. As they affect women, gender relations reflect power relations: which each category 'woman' and 'man' is a hierarchical ordering of status that leads to inequality in the health and well being of women in relation to men.

2.5.1 Gender and tuberculosis

Tuberculosis (TB) remains a major cause of infectious disease mortality worldwide, responsible for an estimated 1.6 million deaths annually or 2.8% of global mortality. In 2002, nearly twice as many men died from tuberculosis as women (1,055,000 deaths or 3.5% of all deaths in men and 550,000 deaths or 2.0% of all deaths in women). Even so, more women died of TB than from all maternal conditions (1.9% of all female deaths) and breast cancer (1.8% of all female deaths) (WHO, 2003a). Both men and women with TB are likely to be in their most

productive years, that is, in the age range 15-44 years old (Stop TB, 2003). At this age men are typically responsible for earning and supporting their families, whereas women as workers, mothers and caregivers usually have families and children who suffer additionally from their illness and death.

Notification rates of pulmonary TB for males are nearly always higher than for females (Borgdorff et al., 2000). However, the true magnitude of male excess for pulmonary TB is difficult to quantify, partly because case detection in most prevalence survey is by sputum microscopy, which appears to be less sensitive in detecting TB in women than it is in men. Questions and debate persist about whether the male preponderance for TB stems more from sex (i.e. biological) differences or more from socio-cultural or gender-based differences (Thorson et al., 2000; Borgdorff & Maher, 2001; Thorson & Long, 2001).

Rates of TB are generally high across the countries of south-east Asia, where TB accounts for between 4.3% and 7.2% of total deaths (WHO, 2003a). Demographic questions here are especially concerned with a disproportionately high female mortality from TB relative to other world regions (Sen, 2003). Persisting pattern of social discrimination against women and unfulfilled social responsibilities of men underscore diverse and complex relationships between cultural values, social practices, and gender-related health and social policy.

2.5.2 Gender differences in delays

While many studies have addressed delays in TB health care seeking in general, few have analyzed gender differences in delays. Although studies report conflicting findings about differences between men and women in delays, the overall trend shows that delays to TB diagnosis for women are longer than men. A study

conducted in Vietnam reported that the mean total delay was significantly longer among women (13.3 weeks) than among men (11.4 weeks). The difference between men and women in total delay was attributed to the significantly longer doctor's delay for women (5.4 weeks) than for men (3.8 weeks) (Long et al., 1999b).

A study from Ghana revealed that delay in diagnosis of pulmonary TB was unacceptably high, and doctor's delay was also significantly longer for women than men (Lawn et al., 1998). Another study in Japan also reported that doctor's delay was significantly longer for female than for male patients (Sasaki et al., 1995). Several studies have shown that even settings where more women than men present for care, they experience longer provider delays (Long et al., 1999b; Needham et al., 2001). Two Japanese studies reported that total delay tended to be longer in men than in women (Niijima et al., 1990; Hooi, 1994), and there was a report of no gender related differences in total delay in Austrilia (Pirkis et al., 1996). Perhaps this is a reflection of different gender roles in different societies and/or differences in TB diagnostic performance of health workers between the study settings.

A population based study in Vietnam reported that although women did not start seeking care later than men, they often sought health care from less qualified providers, took more health care actions, and had longer delay to hospital than men (Thorson et al., 2000). The overall help seeking pattern of men was described to mainly consist of a neglect of symptoms until a late stage of the disease, then followed by a tendency to go straight to public health services, e.g., hospitals, without an initial visit to a private practitioner or an attempt at practicing self-medication. Women were perceived to practice self medication, visit a private health practitioners or a less qualified health provider close to home first, and then see

hospital services (Johansson et al., 1999; Johansson et al., 2000). A study in Catalonia, Spain presented that the proportion of women visiting a health professional was slightly greater than that for men; however, the proportion of hospitalizations was lower among women than among men (Fernandez et al., 1999).

Table 4: Gender differences in delay from onset of symptoms to treatment initiation

Study place	Measure		Patient delay	Provider delay	Total delay
Queensland, Australia (Ward J. et al. 2001)	Median	M (224)	27 days	22 days	
		F (n=140)	30 days	23 days	
		M+F	29 days	22 days	
Alexandria, Egypt (Kamel MI et al. 2003)	> 2 months	M (n=231)		34.6%	
		F (n=103)		39.9%	
		M+F			
Teheran (Masjedi et al. 2002)	Mean	M	15.5 weeks	74 days	
		F	10.5 weeks	112 days	
		M+F	12.5 weeks	97 days	
Tamil Nadu India (Sudha et al. 2003)	Mean	M	10 days		
		F	10 days		
		M+F	10 days		
Recife Brazil (Martinho S. et al. 2005)	Median	M (n=741)			120 days
		F (n=364)			90 days
		M+F			142 days
Turkey (Guneyliogiu D et al. 2004)	Mean	M (n=122)	35.2 days	19.1 days	
		F (82)	25.7 days	26.6 days	
		M+F	31.4 days		
Rural Nepal (Yamasaki-Nakagawa et al. 2001)	Median	M (n=238)		0.8 month	2.3 month
		F (n=98)		1.3 month	3.3 month
India (Balasubramanian et al. 2004)	Median	M (n=433)	14 days	30	
		F (n=133)	14 days	37	
Rural Bangladesh (Ahsan G et al. 2004)	>60 days	M (n=145)	29%		
	>60 days	F(n=162)	50%		
	Mean	M+F	63 days		
London, UK (Paynter S. et al. 2004)	Median	M (n=48)	26 days	26.5 days	77.5 daya
		F(n=23)	50 days	41.5 daya	93 days
		M+F		29.5 days	

2.6 A framework for the study of gender and tuberculosis

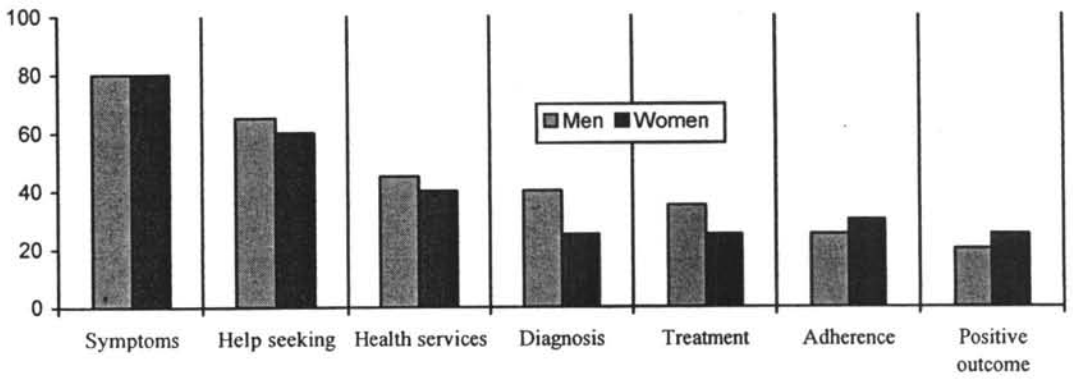

Figure 7: Gender differentials for clarification and study at each step in the course of effective TB control

To be effective public health models for TB control need to take account of the effects of poverty, inequity and other social, educational, political and economic factors that together influence health and illness behavior. Each of these factors, all of which are mediated by gender, affects various aspects of disease control. Uplekar et al. (2001) have formulated a stepwise attrition model for the purpose of analyzing the impacts of gender on TB control (see figure). Their model suggests a research agenda for addressing questions about the role of gender at various points in the sequence of events from initial awareness of symptoms to illness outcome. Seven steps are defined: i) awareness of symptoms; ii) help seeking; iii) health services; iv) diagnosis; v) initiation of treatment; vi) adherence to treatment and vii) positive outcome. The model relies on a framework to identify a series of barriers that may lead to gender disparities at each of the above steps and thus compromise the effectiveness of TB control programmes. In order to identify these barriers at each step in the course of effective TB control, the framework poses questions about self image, status in the

family and society, access to resources, manifestation, and expression of symptoms and stigma associated with TB. The framework recognizes that gender not only influences the behavior of TB affected persons in the community, but also influences provider bias, the effectiveness of sputum examination, and the level of clinical suspicion required to make a diagnosis of TB. Consequently, the model identifies specific research needs to determine whether and how various barriers affect the gender balance of TB.

Although other investigators have analysed various aspects of gender, none has done so within such a comprehensive framework that seeks to cover the full range of activities required for planning TB control. Johansson et al. (2000), in common with several other studies, consider gender as major determinants of disease recognition, help seeking, treatment, and outcome, alongside contextual factors such as socio-economic status and cultural values.

2.7 Why would women have a longer delay to TB diagnosis and initial TB treatment than men?

In a passive case detection approach the most important factors for early case detection include early recognition of TB-suggestive symptoms, early and adequate help seeking of the TB suspects, and appropriate diagnostic performance by the health workers. This process is influenced by three main groups of inter-related factors: i) biological factors (occurrence of symptoms, severity of disease); ii) health care system factors (availability of health care services, accessibility of services, quality of service; iii) socio-economic and cultural factors (poverty, social stigma, isolation, cultural behavioural and belief). These aspects are detailed below.

2.7.1 Biological factors

According to the guidelines of the WHO and IUATLD, the most important suggestive symptoms for pulmonary tuberculosis is a cough for more than 2 weeks (prolonged cough). A community based survey in Vietnam reported that prevalence of prolonged cough is not significantly different between men and women (1.3% and 1.5% respectively) (Thorson, 2000). Another hospital based study from Vietnam reported that prevalence of cough and sputum expectoration among female TB patients was significantly less common than among male patients (Long, 1999). Further, the absence of these symptoms was significantly associated with increased doctor delays among both men and women. Another study in New York city also reported that absence of cough is significantly associated with longer health care system delays (OR 2.9, 95% CI 1.2-6.8) (Sherman et al. 1999). These key symptoms suggestive of TB reflect lesions in lungs, and become more prominent with progressive pulmonary involvement (Banner, 1979). A study from Japan suggests that the stage and the extent of lung lesions are less advanced among female than among male TB patients (Matsushita et al. 1996). There are biological and immunological evidence suggesting that men may have more infectious TB (smear positive pulmonary TB) than women (Bothamley, 1998). In addition, in many societies of Nepal and other developing countries, coughing and spitting up sputum are not socially accepted, especially among women. The cultural belief prevents women from deeply coughing and spitting up a good sputum sample therefore; the probability of finding AFB in the sputum produced by women is likely to be lower than by men.

2.7.2 Gender differences in delays in recognition of TB symptoms

Research conducted in Kenya revealed that TB patients only sought treatment after they had additional symptoms beyond persistent cough (Liefooghe et al., 1997). Elsewhere, many patients failed to identify TB or even consider the possibility of TB from their symptoms, especially the less well educated, who were often women (Health Scope Tanzania, 2003). This results in a tendency among individuals to minimize the importance of their health problems and to discount or ignore the need for treatment. An Indian study found that patients with TB often found it difficult to differentiate symptoms of a serious condition from those of milder problems, such as a common cold. Consequently, many patients did not present to a health centre or clinic for treatment until they experienced haemoptysis (Ogden et al., 1999). Vietnamese study found that men with prolonged cough had better knowledge of TB symptoms than did women, and that recognition of symptoms they associated with TB correlated with seeking hospital care (Hoa et al., 2003).

Many studies have found that men and women do in fact experience and interpret symptoms of TB differently. According to a study in Vietnam, women with TB report cough, sputum expectoration, and haemoptysis less frequently than do men (Long et al., 2002). If women present to health centres without these characteristics symptoms, clinicians may not consider TB as a diagnosis. Health care providers need to be aware of the possibility that some female TB patients may present with symptoms that are atypical for men with TB. It is important to consider gender specific illness experience and reporting styles, and to recognize that such differences may vary between settings and cultures. A study from Egypt revealed that significantly more women than men presented with purpura (as a symptom of TB)

(14.6% vs 2.6%) (Kamel et al., 2003). A study in the urban and rural areas of Pakistan found that cough was the most commonly cited by both males (67.2%) and females (76.5%) and blood in sputum was again cited by the males (17.9%) and females (18.6%) in the urban areas. In the rural areas, 57.7% of males cited cough as a predominant symptoms compared to 21% of females. 25.6% of males gave blood in sputum as an important symptoms compared with only 5.6% of females. Prolonged fever was cited by 19.2% of males but only 4.9% of females. Neither males nor females reported night sweats, anorexia or weight loss as symptoms (Agboatwalla et al., 2003). An Indian study presented that if coughing of blood, enlarged of lymph nodes, and persistence of symptoms as increased severity of illness, patients sought a diagnosis for their illness (Nair, et al. 1997 & Sudha, et al. 2003).

2.7.3 Gender differences in delays in decision making

In many low income countries, women cannot decide themselves to seek health care, but the decision is often made by the husband or senior members of the family. As a result of their subordinate roles in the family, they depend on men or older women for expenses and mobility in the event of illness and disease. Ultimately access to health care is also a result of restrictions on women's mobility and seclusion of women in the household (Okojie, 1994). Furthermore, due to lack of information, women themselves may not recognize the early symptoms of disease and could not take the early decision for health care. The Central Bureau of Statistics (2001) reported that 44.9% in female headed household and 40.6% in male headed households have no access to either television or radio in Nepal. All these factors may lead to poorer health status and poorer access to health care services among women, and therefore, women may receive less adequate health care than men (Key, 1987).

2.7.4 Gender differences in delays in relation to help seeking behavior

Help seeking behavior is a decision process undertaken by an individual or family and friends to cope with illness. The process involves complex socio-cultural, psychological and economic factors. Several models have been developed to study help seeking behavior and health service utilization from different disciplines and perspectives (Tipping & Segall, 1995). Health economists study the utilization of health services through perspectives of equity and fairness in which researchers investigate the interaction of the risks of illness across different social groups, the availability and use of services for the illness and the ability of different social groups to pay for health services (Bogg, 2002). Anthropological studies have correlated people's choice of treatment (modern versus traditional medicine), their belief regarding the cause of the illness (natural versus supernatural causes), and patients characteristics (e.g. age, sex, ethnicity). An anthropologist named Jame C. Young (1981), proposed four criteria that determine patient's choices of treatment which include: perceived severity of the illness, knowledge about the illness and remedy, perceived efficacy of each treatment choice and the cost of the treatment.

Chrisman (1977) and Kleinman (1980) view therapeutic choices as component in the help seeking process. There are five components in the process, namely symptom recognition, sick role, lay referral, treatment action and evaluation and compliance to treatment.

Symptoms recognition: The first step in the help seeking behavior is whether a patient recognizes the symptoms as a health problem. If the symptoms are not recognized, the subsequent steps will not be taken. In this step, the patient also identifies the cause and assesses the severity of the symptoms.

Sick role: After the symptoms are recognized as problems, patient may consider themselves as sick person and will need to take a further step by consulting with their family, friends or neighbors regarding the management of the illness.

Lay referral: Family members, friends, neighbors and other social networks help patients define the symptoms and guide them to treatment action.

Treatment action: Patients, family and their social networks make decisions regarding the treatment action which may include taking no action, conducting self medication, or visiting drug store, health centre, hospital or traditional healer within the public or private sector. This step also includes beliefs and practices about foods, drinking, bathing, exercise, rest etc.

Evaluation of treatment efficacy and adherence to treatment: In this step, patients and their social network evaluate the symptoms and treatment efficacy with common questions. Have the symptoms improved? Are the treatments effective? If the treatment action yields an unsatisfactory outcome, patients and their social network will make further decisions into other treatment options.

Many of the socio-cultural and socio-economic factors that influence detection rates of TB also affect help seeking behavior in both men and women. Some studies support the premises that the relatively lower number of female cases of active TB may be a consequence of barriers to help seeking affecting women more than they do men. In Nepal, for example, it has been reported that among those who presented to health centres voluntarily, only 28% of TB cases were female. However, this percentage rose to 46% among those detected through active case finding (Cassels et al., 1982). Another study demonstrated that active case finding in Nepal identified more female TB patients (Harper et al., 1996). These findings indicate that the under

representation of Nepalese women with TB is likely to be a result of a combination of factors including social barriers (e.g. TB related stigma), women's immobility, economic dependence on husbands or family, and lack of education and awareness of the significance of TB symptoms. In Nepal, routinely collected TB programme data showed that male female ratio of new smear positive pulmonary TB cases was 2:1 (NTP, 2003). In a population based study from Vietnam that screened household residents for TB, Thorson et al. (2001) showed that prevalence of smear positive pulmonary TB was slightly higher among women than men (male female ratio, 1:1.22). This is in contrast to TB programme data, which report a 2:1 ratio of male cases.

Several studies have identified a number of reasons for delayed help seeking that are common to both men and women. a) distrust or lack of confidence in government health facilities combined with the inconvenience and high cost of accessing such services (owing to distance from, and cost of travel to the clinic, and time lost from work; b) social stigma and unwillingness to disclose their condition to others; c) a failure to attribute symptoms to TB or to acknowledge the seriousness of symptoms and the need for treatment (Godfrey-Faussett, et al., 2002).

In other parts of the world, women tend to be more likely than men to ignore the first signs and symptoms of TB and thus delay seeking treatment. In Tanzania, the average delay before seeking care at a public TB facility is 8 weeks among female patients but 6 weeks for male patients (Health Scope Tanzania, 2003). A woman's role as the primary family caregiver, coupled with a lack of financial control within the household, typically means that a women places the needs of her children and other family members above her own, thus delaying heath seeking for

her own health problems, or reserving scares resources for the care of other family members instead. Some women never seek care. The same is true for men who are the primary breadwinners in the household; for them seeking timely care may be difficult or impossible, and adhering to treatment in a DOTS programme may impose the risk of losing wages or becoming unemployed.

The Tuberculosis Control Programme is one of the priority programs of the Government of Nepal. Free sputum examination and free treatment of tuberculosis patients is the policy of NTP in the public health services. A study showed that patients acknowledged problems affording the transport costs to obtain care, and men were more concerned with the economic burden of treatment (Eastwood & Hill, 2004).

TB represents a classic public health issue, as effective diagnosis, treatment and control are important for the whole of society. Hence it is appropriate for the state to play a dominant role in provision of services for TB detection and treatment (Lonnroth et al., 2001a). Nonetheless, studies of health care seeking behaviors in relation to TB repeatedly demonstrate that patients do not always choose a public health care facility, they delay diagnosis and often do not complete the lengthy course of treatment necessary. Steen and Mazonde (1999) found 95% of patients in Botswana visited a modern health facility as a first step. However, after initiating modern treatment, 47% then went on to visit a traditional or faith healer as well. They emphasize the importance of social and cultural factors in contributing to the outcome of TB control. For these patients TB is seen as a European disease that will respond well to Western medicine. Nonetheless a traditional healer is also consulted to explain the meaning of the disease for that particular person: "there is an

increasing tendency to use modern medicine as a quick fix solution, whereas traditional medicine is utilized for providing answer that may be asked about the meaning of the misfortune, and to deal with real cause of the illness" (Steen & Mazonde, 1999; MacKian, 2003). A study in South Africa revealed that 72% presented initially to a hospital or clinic, with only 15% presenting to a spiritual or traditional healer; and 13% to a private doctor. However, the authors recognized a significant failure of official clinical services to diagnose symptomatic individuals. This added to the already substantial problem of late presentation, particularly amongst women (Pronyk et al., 2001; MacKian, 2003). A study in Egypt found that more women than men had attended a private clinic for the diagnosis of TB (28.8% vs 14.7%), whereas more men than women had visited a public chest clinic (51.5% vs 42.7%) or public chest hospital (32.5% vs 20.4%) (Kamel et al., 2003). In Pakistan, about 82% of urban females preferred to go to a private clinic for treatment of minor illnesses compared to 21.7% of rural females. About 63% or the rural females preferred to visit the tertiary care hospital compared to only 13.3% of urban females (Agboatwalla, 2003). Study conducted by Nair et al. showed that 80% of the respondents in both sexes had visited a private medical practitioner during the course of their illness (Nair et al., 1997). An Indian study reported that more than 70% of persons with chest symptoms (80% urban and 63% rural) make one or more efforts to seek care and those private practitioners are consulted more often than governmental health care providers. Participant perception that private health care facilities would provide good care and easy accessibility were the main reasons why they preferred private health care (Sudha et al., 2003).

Several studies have reported that the strong private sector in the developing world is the major threat to effective control of TB. Interestingly, when TB patients do seek care, many do not go directly to public health facilities. Several studies have highlighted that women in particular reach clinical treatment services through a more circuitous route, preferring to seek help first from traditional healers or private practitioners. A study conducted in rural Nepal revealed that approximately half of all study subjects (men and women) first sought care from a private practitioner, and, furthermore, that more women had consulted such providers before they were diagnosed with TB. Nearly all patients in this study (94%) had ready access to traditional healers, i.e. they were reachable within 30 minutes. Government run health facilities were less accessible to most people in that only 50% of those surveyed said that they could reach such services within 30 minutes (Yamasaki et al., 2001).

Private health care providers do not necessarily prescribe the optimal treatment for TB, a problem that is well documented in Mumbai (Uplekar, 1996). They are also less likely to diagnose TB with sputum smears, depending rather on less reliable X-ray techniques. As indicated above, women are more likely to consult diverse sources or shop for treatment, even though they do not delay seeking care longer than men. In addition, not only are women more likely than men to first consult private doctors, but they are also more likely to medicate themselves (Ogden et al., 1999; Thorson et al., 2000). The shopping for treatment often delays diagnosis and the start of effective treatment. This is a problem not only for the patients themselves but also for the public at large, because more people are exposed to potentially infectious persons for a longer period of time. Focus group discussions in

Vietnam have suggested that although men typically neglect heath seeking for TB until symptoms become severe, they are then more likely to seek care at a government hospital (Thorson et al., 2001).

Poverty may compel people with TB to seek care in the private sector instead of at DOTS programme clinics. Although TB medicines in the public sectors are provided without charge, hidden costs (such as the cost of travel) may put these services beyond the reach of many (Johansson et al., 2000). In Nepal, women first sought care from private practitioners, even when they were aware that free treatment was available at the government heath clinics, largely because household responsibilities discouraged them from traveling the longer distances to government clinics (Yamasaki et al., 2001). Some national guidelines require patients to stay in hospital for the first two months of treatment, which can impose a serious economic burden on both patients and their families if they cannot work during that period (Johansson et al., 2000).

In addition to their proximity, other factors may contribute to the appeal of private practitioners. Local private doctors and traditional healers are often well known and trusted, and perceived as more responsive to patients' needs. Patient-centred services, convenient hours, and advice that goes beyond antibiotics (e.g. counseling on lifestyle and diet) offered by private practitioners are likely to be highly valued by patients (Ogden et al., 1999). Sensitivity to social concern and the emotional impact of TB on women may also determine whether or not particular providers are acceptable (Uplekar et al., 1999). The private sector is both challenge and opportunity for improving the current status of case detection, and reducing the delay in seeking the NTP DOTS services.

2.7.4.1 Help care seeking behaviors: the process of illness response

A number of genres of model exist, and variations have been developed around them. One of the most widely applied is the "health belief model". Authors categorized the range of behaviors that have been examined using health belief models into three broad areas: preventive health behaviors, sick role behaviors and clinic use. In this type of model, individual beliefs offer the link between socialization and behavior. One of the earliest examples was Hochbaum's (1956) study of the uptake of screening for TB, where he discovered that a belief that sufferers could be asymptomatic was linked to screening uptake. Threat perception depends upon perceived susceptibility to illness and anticipated severity; behavioural evaluation consists of beliefs concerning the benefits of a particular behavior and the barriers to it. Cues to action and general health motivation have also been included (Becker et al., 1977).

2.7.5 Gender differences on delays in relation to access to health services

Anthropological studies have chosen accessibility (defined as geographical, economic and psychosocial accessibility) to the service as a main criterion for people when making their choice of treatment. In Tamil Nadu, India, Balasubramanian et al. (2004) reported community prevalence rates of smear positive TB that were higher for men than women (male female ratio, 6.5:1); the male excess was reduced among TB clinic patients (male female ratio, 2.7:1). The findings of this study imply that women with TB are more likely to access clinical services of primary health care institutions than are men.

In Cambodia, China and Vietnam, the introduction of user fees in the public health system has created an environment where formal and informal public health fees taken together are similar to the amount charged by the private sector. This has increased inequality between income groups and between men and women and can deter or delay the use of services (Lonnroth et al., 2001a). In addition, fees may not be seen to accurately reflect the perceived value of services. Services provided by public health systems are often described as involving long travel, long waits, inconvenient hours, poor quality of care and inadequate staff with unfriendly attitudes. Poor perception of health services is strongly associated with delay, particularly for women (Godfrey-Foussett et al., 2002; Long et al., 2001; Uplekar et al., 1999).

The low regard for TB control services in public health centres is often based on the poor reputation of the public health system, in general (Auer, et al. 2000). The quality of anti-TB drugs in public health facilities is also often perceived to be poor and patients anticipate a shortage of drugs and supplies. In India, the health centres' inconvenient hours forced a rush of patients just after opening time (9:00 a.m.). The rush prevented providers from offering the one-on-one support that could encourage treatment adherence (Singh et al., 2002). In particular, TB programmes may fail to respond to the needs of specific groups because of provider bias. Within the public health system, formal or informal eligibility criteria may prevent patients from accessing TB services. A study in Vietnam found that TB patients must have a fixed address to be eligible for treatment, while those who are not eligible for treatment are referred to private practitioners (Lonnroth et al., 2001a). This practice

can constitute a major barrier for homeless and temporary migrant TB patients. This type of criteria denies treatment to socially marginalized vulnerable patients.

The accessibility of the private sector is reflected in the large number of men and women TB symptomatic in urban and rural areas who consult private health care providers. However, the quality of TB treatment offered by private sectors is usually inadequate. TB patients are thus forced to make repeated visits to multiple providers in search of quality TB treatment. The private sector is found to attract patients from all socio-economic strata by paying attention to individual priorities (Portero & Rubio, 2003). In the Philippines, the private sector captures a large percentage (11.8%) of symptomatic TB patients who seek care compared to public clinics (7.5%) (Tupasi et al., 2000). In a study in Vietnam, 82% of patients from across socio-economic strata receiving treatment in a government TB centre had been in contact with a private physician (Lonnroth et al., 2001a).

Studies suggest that the level of care offered by the private sector is similar, or even inferior, to that available in public sector. However, patients prefer the perceived confidentiality offered by private practitioners and therefore accept the poorer quality of care (Khan et al., 2000). Women especially those from 15-24 years of age, are more likely than men to seek diagnosis and treatment from private practitioners. Convenient timing and location, cordially, desire to keep TB diagnosis a secret, and fear of social stigma and rejection are among the reasons women cite for consulting private providers (Uplekar et al., 1999 & Lonnroth et al., 2001a).

In many settings, living long distances from health facilities is the most frequent barrier to access faced by the poor. Other physical barriers, from difficult terrain to living in remote communities, can impede physical access to health services.

Distance to health facilities, rural residence is also know to contribute significantly to delay (Lienhardt et al., 2001; Wandwalo & Morkve, 2000; Demissie et al., 2002). A study in China found that farmers experience longer delay in seeking treatment (Xu et al., 2005). Health facilities in rural areas may be more difficult to access, have more poorly trained staff, and lack proper supervision of staff (Lienhardt et al., 2001).

A study in Colombia reported that the cultural based explanation patients give to the symptoms, the stigma attached to the disease, and the poor quality of health care services (communication skills, organizational structure, attitudes, and knowledge of the TB control strategy of health care workers) are strong barriers to early diagnosis (Jaramillo, 1998). Johansson et al. (2000) reported that a limited interaction between doctor and patient, where the patient had not really understood the doctor's message. It demonstrates not only lack of trust in the doctor, lack of transparency and poor communication between the doctor, patient, and family and anther aspect of limited interaction was that mentioned, in which several male doctors n Vietnam described a non-functioning communication between male doctors and female patients.

2.7.6 Gender differences in delays to diagnosis and treatment

Globally, direct sputum smear examination by microscopy is the key diagnostic method for smear positive pulmonary TB. It is strongly recommended by WHO and IUATLD to apply to all people with a cough for more than 2 weeks. However, a study from Vietnam reported that among people with cough for more than 3 weeks presenting to hospitals, fewer women than men were requested to have a sputum test for AFB (14% and 36% respectively) (Thorson et al., 2000). Other studies, for example, a large study of more than 60,000 suspects examined for

tuberculosis in five developing countries, found the opposite (Rieder et al., 1997) A study from Ghana also noted that doctor's delay was longer among women than among men, and increased doctor's delay was significantly correlated with rates of failure to perform sputum microscopy (Lawn et al., 1998). Another study in Vietnam revealed that delay in diagnosis of TB in was due to more to inability among health care providers to detect TB than to under-utilization of health care services. Private physicians used X-rays, sputum smears, and referrals significantly less often than public health care providers (Lonnroth et al., 1999). Studies from various countries indicated that low utilization of sputum examination was the main cause of delays especially among women than among men (Sasaki et al., 1995).

In an attempt to determine the reasons for this, Thorson and Johansson (2004) analyzed physicians' perceptions of the longer provider delay for female TB patients. Among the reasons given, physician respondents mentioned the behaviour of female patients, explaining that even after a consultation requesting sputum for diagnostic testing female patients often returned home or approval from their family and neighbors before providing a sputum sample. Men, on the other hand, were more likely to demand a comprehensive diagnostic evaluation from their doctors (Thorson and Johansons, 2004). Delayed diagnosis compromises the health of women patients, and it also potentiates the spread of infection.

The WHO recommends that all patients who present at health centres with a prolonged cough (i.e. of more than two weeks duration) should be tested for pulmonary TB through direct microscopic examination of sputum. However, some evidence suggests that such screening procedures may be less sensitive for detecting TB in female patients than in men (WHO, 2002a). Low sputum positivity among

women with TB may result from women's inability, or unwillingness, to produce sputum of the required quantity and quality for testing. False negative results are thus more common in women than in men. It is therefore critical that health care providers recognize that women with TB are more likely to present for treatment without normative symptoms and without positive microscopy (WHO, 2002a).

Women may still experience longer diagnostic delays even when they present with typical symptoms. In Vietnam, Thorson et al., (2000) reported that in settings where the prevalence of prolonged cough is similar for men and women (1.5% for men, 1.3% for women), women were less frequently tested by sputum smear microscopy than men (36% of men versus 14% of women in study sample). Observations in Bangladesh (Begum et al., 2001) and India (Uplekar et al., 1999) also indicate that fewer women undergo sputum microscopy when they seek treatment for comparable respiratory symptoms. Whereas two out of every three men with chest symptoms were tested for TB in a clinic in Gujarat, India, only one out of every three women with similar symptoms underwent sputum examination (Uplekar et al., 1999). Several studies have explored the possible reasons for the observed differences in speed and probability of diagnosis. One possible explanation offered is that women may be too embarrassed or ashamed to produce a sputum sample at the health centre because it is socially discomforting for them to cough vociferously in public (Uplekar et al., 1999; Begum et al., 2001).

There are a range of factors, both general and gender-specific, that act to delay the start of treatment even after a correct diagnosis for TB; these include insufficient staffed and poorly supplied clinics, difficulty in reaching a clinic due to high transport costs, and competing responsibilities and social obligations. The latter

are likely to be a particular problem for women with TB; in some settings it may be difficult for them to get to the clinic to receive their medicines. In addition, health care providers may deny proper treatment to certain patients (Singh et al., 2002). Data from two DOTS clinics in Delhi, India, revealed that more than half of the patients were denied DOTS therapy, the majority of whom were very poor and/or socially marginalized (Singh et al., 2002). The longer patient delay may also make the diagnosis of tuberculosis easier as patients present at a more advanced stage. The underlying cause of long health services delay was shortage of health workers especially laboratory technicians, was cited in the Ethiopian study (Demissie et al., 2002).

2.7.7 Gender differences in knowledge about TB and its treatment

Low education and knowledge of TB may also affect the way symptoms and possible treatment are perceived and understood by individuals and communities, which strongly influences help seeking behaviour. In a Mongolian study, patients who were afraid of being diagnosed with TB delayed seeking treatment (Naranbat, 2003). Lack of information on TB may also reduce the probability that a person will accept a diagnosis of TB because of apprehension about the disease. In a study from Bangladesh, lack of awareness, i.e., not knowing where to go for treatment was reported more frequently by female TB patients than male patients (Hamid Salim et al., 2004).

A Pakistani study revealed that very few people were aware of the causative agent of TB, especially rural females (24.5%). Sputum testing, however, was not well known, with only 24% of urban males, 28.8% urban females, 23.1% of rural males and only 6.3% of rural females being aware of it. In the rural areas, 37.2%

of males and 24.5% of females cited that TB is spread by droplets while in the urban areas this was cited by 38.9% of males and 28.8% of females. 7.1% of the urban females reported that completion of treatment at home was the best protective measure while this figure was 22.4% for rural males (Agboatwalla et al., 2003). An Indian study in Bombay found that almost equal numbers of male and females respondents stated germs and worry as the cause of tuberculosis (Nair et al., 1997). Most of the respondents (male and female) stated that regular treatment was needed but details of duration were not known by either males or females (Nair et al., 1997). The Nigerian study stated that the delay by patients is probably due to a low level of knowledge and awareness of the disease and lack of information about availability of free treatment (Olumuyiwa et al., 2004).

2.7.8 Gender differences in perception about TB and its treatment

Perceived dangerousness of TB, perceived risk of acquiring TB and perceived causes of TB may influence help seeking behavior and treatment delay. A study in Philippines showed that 55% of the respondents perceived that TB is really dangerous and only about 20% of the participants perceived TB to be only slightly dangerous or a harmless disease and 15% did not consider themselves vulnerable to TB (Auer et al., 2000). A higher proportion of men than women considered 'often smoking' (94% of the men vs. 86% of the women) and 'often drinking alcohol' (94% of male vs 84% of the women) to be a definite or probable cause for someone getting TB (Auer et al., 2000). Long et al. (1999) pointed out that women were perceived to have less social contacts than men. This may also prevent women from seeking health care from qualified health care providers.

An example of this danger is the traditional perception in the four different types of TB, where it is believed that only one of the four traditional types is looked upon as contagious (Long et al., 1999). This has implications for TB control and treatment in terms of increased risk of spreading the disease and also a belief that it is not necessary to treat the disease with anti-TB drugs in three of the four types. Similar traditional perceptions of TB have been described from other countries. In Kenya, Liefooghe et al. (1997) described how TB was perceived as hereditary, handed down to the later generations within the family. The disease has further been described in Pakistan (Liefooghe et al., 1995) and in the Philippines (Auer et al., 2000) as a family disease and hard work rather than one affecting the individual.

2.7.9 Gender differences in relation to socio-demographic factors

Many studies pointed out that gender differences in educational opportunities and access to information, in general. Lower level of education is significantly associated with delay (Needham et al., 2001; Lienhardt et al., 2001; Naranbat, 2003). Low education has also been linked to poor knowledge and erroneous beliefs about TB (Portero et al., 2002). In a study in Manila, the urban poor thought that drinking, gambling and hard work played a larger role in contracting TB than did person-to-person transmission (Auer et al., 2000). A study in south India revealed that 43% of illiterate participants, and 52% participants above 45 years of age, especially those in the rural areas, did not take action or delayed taking action (Sudha et al., 2003). A study from Turkey revealed that sex, age, residence area, and education level had no significant effect on the patients delay (Guneylioglu et al., 2004). A study in Tanzania reported that patient's delay is significantly longer in rural areas, for patients with lower level of education, for those who first visited traditional

healers, and for patients who had no information on TB prior to diagnosis. Due to socio-economic barriers, women are likely to experience these factors more commonly than men (Wandwalo, 2000).

2.7.10 Gender differences in relation to socio -economic factors

In many low income countries, women often have a lower social position and poorer access to economic resources, education, and information than men (Paolisso & Leslie, 1995). In Nepal, out of 4.17 million households, 14.9% are female headed and 85.1% are male headed household. More than 90% of the households do not have any female ownership in livestock. However, the proportion of households with some female ownership in livestock is slightly higher among female headed households than that among the male headed households (The Central Bureau of Statistics, 2001). This is one of the major characteristics of gender discrepancy prevailing in the Nepalese society. These gender differences influence both health risks among women and care seeking behavior as well. Que et al. (1999) reported that men often have the last work in making decisions abut production, business, and the allocation of household resources in the family.

Although economic resources are available in the household, important expenditures are often dictated by male heads of households. In Nepal, the men are advantaged relative to women in accessing the households' resources and its allocation and utilization (The Central Bureau of Statistics, 2001). In Vietnam, large expenditure and health care expenditures were more commonly decided by the husband (46.7% and 40.6% respectively) than by the wife (14.3% and 19.1% respectively) (Long et al., 2000).

TB is frequently referred to as a disease of poverty. People living in overcrowded and poor environments have a higher risk of becoming infected by TB, developing the disease and assuming a lack of access to care. The improvement of socio-economic conditions decreased the prevalence in most industrialized countries. Within industrialized countries like the United Kingdom, TB morbidity and mortality was much more prevalent in lower social classes. The increased rate of TB is also significantly associated with political turmoil and war, AIDS epidemics, injection drug use and homelessness (WHO, 2001). The economic impact of tuberculosis is significant. The resulting economic burden on patients and caregivers is an important contributing factor to delayed diagnosis (Needham et al., 1998). This delay is an important public health risk because untreated sputum smear positive person can infect 10-14 others in a year (Murray et al., 1990). Important economic barriers include lost income, transportation expenditures, and spending on special food (Needham et al., 1998).

Although DOTS provides free diagnosis and treatment, repeated visits to health facilities are required. The cost of transportation and food, coupled with lost income because of time away from work, may be more than poor TB patients or families afford (Lonnroth et al., 2001b). A study from Malawi estimated that on average, TB patients spent US$ 13 and lost 22 days from work at the diagnosis stage alone (Mann et al. 2002). In a study in Vietnam, TB patients explained that poverty forced them to choose to work instead of undergoing treatment (Johansson et al., 1996). Personal health may not be regarded as a priority when survival itself is a struggle (Tupasi et al., 2000; Auer et al., 2000). Men are more likely to delay in help seeking and to default from the treatment because of pressure to return work, alcohol

and drug addiction. Pressure to do housework and the strain of keeping their condition a secret seems to cause women to delay in help seeking and default from the treatment (Uplekar et al., 1999). In other words, women are pressured by both the economic and social costs of TB while men are more concerned with the economic burden. Interestingly, it has been reported that women have higher treatment compliance rates than men (Uplekar et al., 1999; NTP, 2004). A prevalence survey from Bangladesh found that both female suspects and cases were significantly more likely to be financially dependent than males (84% vs 21.5%) and the main reasons for not seeking treatment were financial (68% of females and 76% of males) (Hamid-Salim et al., 2004). A study in Teheran found that inability to get medical advice due to dependency on their husbands was the underlying reason for 13% of women (Masjedi et al., 2002). An Indian study pointed out that about 46% of the respondents stated lack of money as reasons for failing to seek care (Sudha et al., 2003). Poor economic status was an important reason of patient delay found in the study carried out in the Turkey (Guneylioglu et al., 2004).

2.7.11 Gender differences in relation to socio-cultural factors

TB is a disease strongly associated with traditional beliefs and stigma. Studies have found that, in some settings, women may suffer silently for longer periods of time because of cultural expectations, forcing them to accord lower priority to their own health (Uplekar et al., 1999). In the Philippines, TB is referred to as shameful and as a bad mark on the family (Long et al., 2001). In Vietnam, TB has been described as a dirty condition that mainly affects poor people and is caused by hard work, overwork and bad hygiene (Johansson et al., 1996). Studies reveal that stigma is an important factor contributing to delay, as it seems to weigh strongly on

patients' decisions regarding diagnosis and treatment. TB symptomatic who felt that they would be hated because of TB delayed seeking treatment longer (Auer et al., 2000). Women, especially, shop around for a more appropriate diagnosis and treatment (Uplekar et al., 1999). Some studies have found that women may wait up to twice as long as men before seeking treatment, citing fear of isolation from families and community (Hanson, 2002; Johansson et al., 2000). Upon diagnosis, TB patients may not accept the diagnosis, or may become frustrated, disappointed or worried (Liefooghe et al., 1999; Johansson et al., 1996; Khan et al., 2000). This negative response to TB diagnosis may result in their unwillingness to be officially registered as TB cases in health facilities (Lonnroth et al., 2001b). Patients may opt out of treatment or seek treatment from private providers because daily visits to the health centre can identify them as TB patients. This especially true for women who are more susceptible to stigma and wish to keep their condition a secret (Balasubramanian et al., 2000; Uplekar et al., 1999; Lonnroth et al., 2001a). Importantly, a study in Vietnam suggests that, once diagnosed, patients are likely to revert to a traditional understanding of TB (Johansson et al., 2000). Such negative responses to TB may also influence treatment outcomes.

Several studies show that stigma plays a greater role in shaping women's experience of illness and help seeking behaviour than men's. Being largely dependent on their husbands or families, women's concerns about the social impact of TB may include realistic fears of isolation, rejection from their family households and even divorce. Various factors are responsible for such concerns, in particular, misconceptions about the risk and spread of TB. A study among Zambian men and women, 79% declared that they would not like to use the same eating utensils as a TB

positive relative who was currently undergoing treatment, 60% would not like to marry someone who previously had had TB, and 49% would refuse to sleep in the same bed as a spouse on treatment for TB. Generally speaking, women are more frequently targets for such biases than men (Godfrey-Faussett, et al., 2002). According to a study by Johansson et al. (2002), women in Vietnam fear stigma more than men, so mush so that they would often opt to isolate themselves as protection from stigmatizing interactions. Men, on the other hand, were more likely to be concerned with the economic burden of TB and earning potential. In sum, it appears that both men and women may deny TB symptoms for fear of TB related stigma, but for different reasons. Erroneous beliefs about the cause of TB have been described by many researchers (Liefooghe et al., 1997). Negative perceptions lead to delays in accessing treatment (Liefooghe et al., 1999). Women in particular hold negative beliefs about TB (Eastwood & Hill, 2004). Negative associations (e.g. TB being a disease of the poor, dirty people, alcoholic and smokers, heredity, sinner, wish of God etc.) may lead to unpleasant social consequences. The fear of isolation and feeling ashamed of having TB can lead to rejection of potential diagnosis and delayed voluntary presentation and associated with greater diagnostic delay and reduced compliance (Barnhoom & Adriaanse, 1992).

Tuberculosis has been well recognized as disease which is closely associated with social and behavioral factors. It has consistently been proposed that TB and AIDS are social diseases whose patterns of transmission must be understood, not only through the clinical or laboratory studies of bacteria and virus, but also equally through the study of attitudes, behaviour and social organization (Ankrah, 1989; Campbell & Mzaidsume, 2002; Dubos & Dubos, 1992; Ford & Koetsawang,

1991; Grange, 1997; Ogden et al., 1999; Rubel & Garro, 1992). Goffman (1963), a prominent sociologist, in his pioneer work on stigma provided important understanding into the socio-cultural construction of illness associated with social unexpected behaviors. Goffman defines stigma as an attribute that is deeply discrediting. There are two types of stigma, i.e. enacted stigma and felt stigma. Enacted stigma refers to actual discrimination or unacceptability. Felt stigma refers to the fear of such discrimination (Scambler, 1998). Alonzo and Reynolds (1995) define stigma as a broad and multidimensional social concept essentially focusing on social deviance. Stigmatized people are devalued, shunned by society and therefore have less of a chance to receive humanizing benefits in addition to participating in less social interactions. Several diseases and ailments such as TB, AIDS and leprosy are stigmatizing, while diseases such as the common cold and hypertension are not. Whether or not a disease is stigmatized, depends on the following criteria: Is the disease associated with deviant behavior? Is the disease perceived as a contagious disease? Is the disease incurable and life-threatening? Does the disease cause an unpleasant physical appearance? Is the disease perceived as a heredity disease? TB, AIDS and leprosy involve almost all the above criteria and therefore are considered to be among the most serious and most stigmatizing diseases of this era (Alonzo & Reynolds, 1995; Helman, 1990). Several socio-cultural factors including misperceptions about TB, delay in seeking care, non-adherence to treatment and TB stigma had already undermined effective TB control in most developing countries.

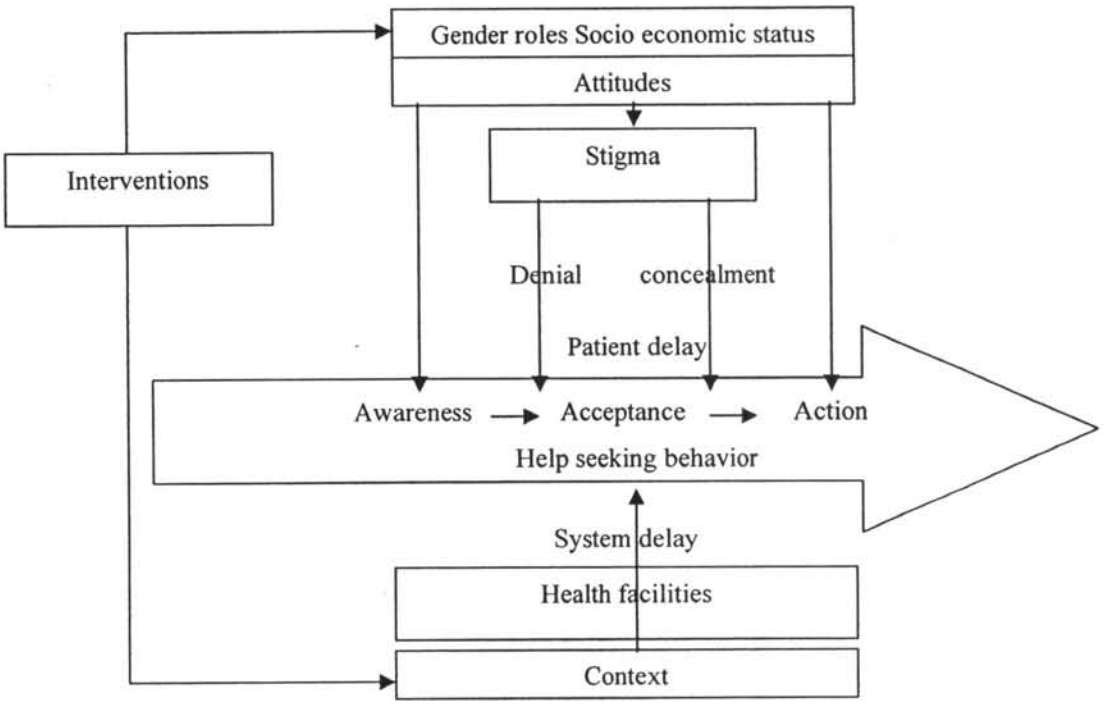

Figure 8: Direct contextual influence on health care seeking behavior and indirect influence on health care seeking behavior mediated via stigma, denial and concealment of disease (Johansson et al., 2000)

A model of contextual influence on health care seeking behavior was developed by Johansson et al. (2000) (figure 8). The model shows how the context of TB relates to stigma, mediated via denial and concealment of the disease, and actual health care seeking behavior. Two types of delay were identified; patient's delay and systems' delay.

Two types of stigma observed: one related directly to the patient him/herself, felt stigma, and another related to the surrounding family or community, enacted stigma. Fear of enacted stigma was the main concern of women upon suspicion of TB, in health care seeking and in compliance with treatment. Women even isolated themselves because of felt stigma and for fear of enacted stigma. Men did not demonstrate the same fear of enacted stigma (Johansson et al., 2000). The

main reactions to both felt and enacted stigma were denial and concealment of the disease leading to self medication, delay in health care seeking and interruption of treatment; these latter may in their turn lead to severe forms of TB, development of chronic disease, drug resistance and even death.