Government of the People's Republic of Bangladesh
Ministry of Health and Family Welfare
Health Economics Unit

Study on Tuberculosis and the Poor

Final Report

Prepared by
Center for Development Studies
61/A Siddheswari Road (1st floor)
Dhaka # 1217

Government of the People's Republic of Bangladesh
Health Economics Unit
Ministry of Health and Family Welfare

Study on Tuberculosis and the Poor

Final Report

The Research Team

Md. Moniruzzaman, PhD, Economist & Anthropologist, Team Leader
Dr. Nowfel Islam, MBBS, TB & Health Specialist
Md. Khan Jahan Ali, Statistician
Md. Shamsul Alam, System Analyst

Edited By
A.K.M.Ghulam Rabbani, PhD, Economic Statistics
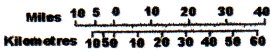
Program Coordinator
Khandaker Rashedul Haque, PhD Fellow,

June 2002

Center for Development Studies
61/A Siddheswari Road (1st floor), Dhaka-1217

PROJECT LOCATION MAP

Miles 10 5 0 10 20 30 40
Kilometres 1050 10 20 30 40 50 60

LEGEND

————	International Boundary
————	District Boundary
～～～	Rivers
▨▨▨	Project Area

INDIA

PANCHAGARH
THAKURGAON
NILPHAMARI
LALMONIRHAT
DINAJPUR
RANGPUR
KURIGRAM
GAIBANDHA
JAIPURHAT
SHERPUR
NAOGAON
SUNAMGANJ
SYLHET
JAMALPUR
NETROKONA
BOGRA
MYMENSHING
NAWABGANJ
MOULVIBAZAR
RAJSHAHI
SIRAJGONJ
KISHOREGANJ
HABIGONJ
NATORE
TANGAIL
PABNA
GAZIPUR
NARSINGDI
BRAHMANBARIA
KUSHTIA
MANIKGANJ
DHAKA
INDIA
MEHERPUR
RAJBARI
NARAYANGANJ
CHUADANGA
MUNSHIGANJ
COMILLA
JHENAIDAH
FARIDPUR
KHAGRACHARI HILL TRACTS
MAGURA
SHARIATPUR
INDIA
MADARIPUR
CHANDPUR
JESSORE
NARAIL
GOPALGANJ
LAKSHMIPUR
FENI
RANGAMATI HILL TRACTS
KHULNA
BARISAL
NOAKHALI
SATKHIRA
PIROJPUR
BAGERHAT
JHALAKATHI
CHITTAGONG
BHOLA
BANDARBAN HILL TRACTS
PATUAKHALI
BARGUNA
COX'S BAZAR
MYANMAR

BAY OF BENGAL

East of Greenwich

TABLE OF CONTENTS

Page

Chapter 4

COST OF ILLNESS

Chapter 5

COPING STRATEGY OF THE STUDY PATIENTS

Chapter 6

GENDER INEQUALITY

Chapter 7

CONCLUSIONS AND DISCUSSIONS

LIST OF TABLES AND FIGURES

LIST OF FIGURES

Appendix

ABBREVIATIONS

AIDS	: Acquired Immuno-Deficiency Syndrome
BBS	: Bangladesh Bureau of Statistics
CBN	: Cost of Basic Needs
CCD	: City Corporation Dispensary
CDS	: Center for Development Studies
DOTS	: Directly Observed Treatment, Short Course
ESP	: Essential Services Package
FGD	: Focus Group Discussion
GO	: Government Organization
GOB	: Government of Bangladesh
HEU	: Health Economics Unit
HH	: Household Head

HIV	: Human Immuno-Deficiency Virus
HPSP	: Health & Population Sector Program
MOHFW	: Ministry of Health and Family Welfare
NGO	: Non-Government Organization
NTP	: National TB Control Program
PPP	: Purchasing Power Parity
PRU	: Policy & Research Unit
TB	: Tuberculosis
TOR	: Terms Of Reference
UHC	: Upazila Health Complex
WHO	: World Health Organization

ACKNOWLEDGEMENT

We are happy that the final report on STUDY ON TUBERCULOSIS AND THE POOR is being submitted. We firmly believe, the report will benefit both the government for future policy directions, and other concerned organizations to use it as a reference for future study on the issue.

The study involved a host of people and a lot of activities including financing and other moral, material and administrative support. Without these this study could not have been implemented.

The survey team that worked in the field deserves special mention. In the actual field conditions the team, especially the female members, came across a number of unanticipated problems. We are extremely happy to note that they overcame all such problems they encountered with perseverance and equanimity. Without their perseverance, courage and equanimity quality and validity of the data collected could not have been ensured.

The field functionaries, both in the government and outside of the government system, deserve our appreciation for their help and cooperation during reconnaissance visits and field survey. They extended all possible help and support to CDS officials, Core Research Team and members of the data collection team. Some of the officials and employees deserve special thanks as they went beyond their official responsibilities to lead the CDS team through all difficult phases and experiences.

The CORE RESEARCH TEAM (CRT), together with their support members like data entry operators, coders, data checkers and computer operators, has done commendable jobs by demonstrating a sense of commitment and mission. They have undertaken every effort to process and finalize the report with as much sincerity and devotion as possible to make the report as reliable and valid as can be.

We owe a great deal of thanks and gratitude to DFID and WHO for funding this study. In fact, it was their kind financial help and support which has played the most vital role in materializing this study. There is no room for argument that without their financial support and help this study could not have been possible. It would be no exaggeration to confess that they merit special thanks and gratitude from CDS.

We confess with great sense of honour and gratitude the contribution that Mr. Geoff Hoare, Team Leader, HEU and Dr. Pierpaolo de Colombani, Medical Officer (TB), WHO, have made to the refinement and restructuring of the report in its true perspective. Their invaluable suggestions and comments on the DRAFT FINAL REPORT helped us to a great extent to employ new insight into the findings and recommendations made in the report.

Finally, we recall with great sense of recognition that the Health Economics Unit (HEU) under the Policy and Research Unit (PRU) of the Ministry of Health and Family Welfare deserves special thanks and gratitude for this study. The HEU not only reposed their confidence in CDS, they also had extended all possible moral and administrative support CDS needed to carry out this important study without any hindrance. Anytime CDS requested them for any help, the HEU responded very quickly and effectively. CDS owe them a great deal.

We appreciate contributions of all other friends, officials, employees and members of the general public who helped CDS in various capacities to make our effort a success. We expect the report will be very useful as a source of reference for further interventions in TB service programming, and guidance for future study.

Professor Muzahidul Islam
Executive Director
Center for Development Studies

STUDY ON TUBERCULOSIS AND THE POOR

Executive Summary

Government of Bangladesh (GoB) has been implementing a National Tuberculosis Control Program (NTP) since 1993 with the help of WHO and a consortium of donors. To achieve the program objectives and to enlarge the access of the poor patients to an effective TB treatment regimen, GoB is delivering with the help of health NGOs and others a community based state-of-the-art DOTS (Directly Observed Treatment-Short Course) treatment developed by WHO.

It is generally believed that TB and poverty are intertwined in Bangladesh. Majority of the victims of TB in the country are poor persons. To explore the linkages of TB with poverty and to assess the utilization of DOTS by the poor patients, the Health Economics Unit of the Ministry of Health of the GoB with funding from DFID and WHO initiated a study which was carried out by CDS, a private research organization.

The ToRs of the study were as follows:

1. Measure the utilization of DOTS TB services by the poor.
2. Estimate the treatment cost incurred by TB patients' households.
3. Estimate economic losses suffered by households due to TB.
4. Identify coping strategies of households with respect to economic losses due to TB.
5. Examine gender inequality in DOTS treatment, accessibility and household expenditure during illness.

Pursuant to the ToRs, the study was carried out on a random selection of TB outpatients undergoing DOTS treatment in four upazila health complexes and one chest clinic in the district of Rangpur representing the rural areas, and eight urban dispensaries, one chest clinic and a tertiary hospital in the city of Chittagong. Detailed data on the socio-economic characteristics, utilization of DOTS treatment, treatment related expenses and loss of productivity and income and related topics were collected through interviews utilizing five questionnaires or data collection instruments that were earlier field tested for their efficacy. The study also developed a database by ranking the study patients and their characteristics by their per capita income.

To sharpen the focus of the study on poverty-TB nexus, the data analysis separated the study patients into poor and non-poor groups with the help of poverty lines. Instead of using national poverty line, which is too aggregated, disaggregated geographic or area specific poverty lines, developed by the Bangladesh Bureau of Statistics on the basis of the nationwide household survey of 2000 were used and a more realistic grouping of the study patients into the poor and non-poor categories was obtained. Pursuant to the study ToRs, all study parameters were analyzed through poor and non-poor comparison, which helped reveal more meaningfully the linkages of TB and poverty among the study patients.

The distributional aspects of the study parameters were also analyzed by quintile analysis, which supplemented all poor non-poor comparisons and brought out clearly the distributional inequalities in the demographic and human resource endowments, income, asset ownership, economic losses and coping strategies of the study patients.

Findings of the Study:

1.   As for the utilization of DOTS services by the poor, the study found that a significant majority (70%) of the study patients belong to the poor segments of the population and had income below the area specific poverty lines (of Taka 582 per person per month or Taka 19 per day per person in rural Rangpur and Taka 971 per month or Taka 32 per day per person in urban Chittagong area). In fact, 61% were found to be absolutely poor and had an average income lower than national poverty line of Tk. 582 a month. At the same time, a good proportion of the

The TB patients (45%) were found to be agricultural day laborers/day laborer and marginal farmers, while the 20% of the urban patients service holders, craftsmen (6%), and rickshaw pullers (5%). Again, most of the poor patients were residing in thatched houses with very little sanitary facilities or electricity but had access to tube-well water for drinking purposes. Majority of the study patients across the rural and urban areas were found to be illiterate and without any formal education. The asset ownership pattern also showed relatively much less possession by the poorer segment of the patients.

2.   Although DOTS treatment (services and medicine) was largely provided free, except for travel costs and expenses of the accompanying persons, most of the study patients were found to be incurring large expenses for treatment due to the expenses incurred before being registered with DOTS and also on account of expensive but DOTS non reimbursable cost of procedures. Some patients were also found to be purchasing the required medicine due to non-availability of supply. Adding travel expenses, expenses on account of the diets of the patients and expenses of the accompanying persons, the cost of illness increased significantly and was found to be generally of catastrophic dimension when compared to the patients' declining incomes resulting from the on-set of the disease. On the average, treatment cost was found to be slightly higher than the patients' monthly income, but almost 50% higher in case of the poor patients. The patients themselves or their spouses were found to bear the major share of the treatment expense.

3.   The TB patients suffered significant economic losses (loss of productivity on account of their illness). Economic losses were estimated by valuing the workdays lost by the study patients by their estimated average daily earning or wage. In case of non-working female patients, estimated expenses on account of substitute work helps were used. The estimated economic losses were found to vary from seven and half times the per capita income in case of the poor patients, and more than twice the per capita income in case of the non-poor patients. The economic losses suffered by the TB patients were thus found to be of catastrophic dimensions. The hardship of the patients, particularly the poor patients, were compounded in absence of social safety nets and majority of the patients (72%) were found to adopt coping strategies the impact of which on their livelihood or asset holding was largely negative.

4.   The general pattern of coping strategies adopted by the poor and non-poor patients in face of catastrophic losses of productivity and income suffered on account of TB is stated to be manifold. In the face of meager or non-existent family savings, more than a third of the study patients were compelled to take loans, majority from relatives or friends. Besides, some reduced expenditures on basic needs like food and clothing, some were compelled to sell assets as well.

5.   In respect to gender inequality with DOTS treatment, accessibility and intra-household expenditure pattern, the study did not find any inequality in DOTS treatment or accessing DOTS treatment regime by the female patients. However, the focus group discussion brought out the existence of intra-household inequality in the treatment received by the female patients on account of their illness, particularly from the their spouse or other family members. In outside workplaces, on the other hand, they did not face any discrimination or adverse treatment on account of their illness; rather they were meted out with friendlier treatment or advice.

Recommendations:

In light of the above findings, the following recommendations are made:

1.   Although the study revealed that, the DOTS TB services are being utilized by relatively poorer segments of the population both in the urban and rural sectors, it was also found that only a little more than a quarter (27%) of the study patients registered directly with DOTS. Majority of the study patients sought remedies initially from the private and indigenous medical practitioners. It is only after wasting a lot of time and money, they registered themselves with DOTS.

This is indicative of lack of adequate awareness and information flow among the people. As such, a comprehensive awareness building and motivation program is needed to inform the people in general, and potential as well as actual TB patients in particular, about the services being provided under the DOTS TB program.

In addition to the motivation and information campaigns, skill development training related to identification and referral of TB cases for the Health Workers may be strengthened so that the workers can identify the potential TB cases at the first instance and make necessary referrals for bringing the patients under the DOTS program. Even the private Village Doctors who were reportedly consulted by 73% of the study patients in connection with their TB treatment may also be brought under the purview of such skill development training.

1.   Although the DOTS program envisages providing free services and medicines to the patients, it was found that in some instances the supply of medicines could not be ensured on time. The reasons stated as: there was no medicine in the center, absence of the dispensing person, demand of underhand money from the clients and hartal. In view of this, it is recommended that the medicine stock at the service centers should be ensured. It is also recommended that the staff be motivated not to exploit the patients.

2.   It has been reported that the patients had to arrange for the pathological and other tests at their own cost, which is very exorbitant for the poor people. Options should be explored as to how such a cost can be avoided or even subsidized.

3.   Efforts are to be taken to minimize the number of defaulters/drop-outs. One way of improving the situation particularly in the rural areas is to strengthen the follow-up and monitoring activities by the respective Health Workers who will have the responsibility to ensure continuous treatment of the patients. The counseling services by the staff need to be strengthened so as to enable the patients to take informed decisions in respect to the periodic status of their treatment vis-à-vis their ailment.

5.   As revealed in the FGDs with the female patients, there were instances of discrimination with women patients at their own *household level*, where they had been physically assaulted and even driven out from their husbands' house as they were having TB. As such, it is strongly recommended that a holistic approach be adopted to educate all the household members not to discriminate with the female patients. Even the community leaders such as UP Chairperson and members and other elite persons should be associated with such motivation campaigns.

6.   Effective income-generating options should be explored to form social safety nets for the TB infected patients in order to make up their household income and asset loss and to arrest the process of pauperization.

Chapter 1
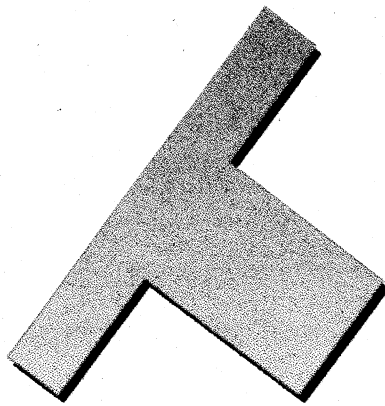
Introduction

Chapter 1

Introduction

Bangladesh is a country with relatively high TB- burden, where it is prevalent in endemic form from ancient time. The current incidence rate is high, more than 300,000 new TB cases are occurring every year in the country resulting in the incidence rate of TB to be around 234 per 100,000. Of these, nearly 50% are smear-positive or infectious posing serious risk of transmission in a densely populated country like Bangladesh. Deaths from TB are also high, nearly 70,000 deaths (7% of all deaths) occur every year from TB in the country. Like malaria and HIV/AIDS, TB is closely related to poverty. Pervasive poverty of the population of the country adds to the social costs of the disease and the poor seem to be major victim of TB in Bangladesh. Although the incidence of HIV/AIDS is presently low in the country, the epidemiology and transmission pattern of TB can become complicated with the consequent flaring up of its incidence, if HIV/AIDS incidence rises significantly in the future.

Scope and organization of the study

1.02   With pervasive mass poverty TB and poverty seem to be intertwined in Bangladesh. This study explores some of the key aspects of the linkages between TB and poverty in the country. The study is based on the data collected through interviews from a random selection of TB outpatients undergoing state-of-the art DOTS treatment in the DOTS units in four upazila health complexes and one chest clinic in the district of Rangpur and eight urban dispensaries, one chest clinic and one TB hospital in the city of Chittagong.

1.03   The report is divided into seven chapters. The first chapter is an introductory one and gives an overview of the purpose, objectives of the study and methodology followed in conducting the study. The second chapter sets the background to the study analysis and provides a broad socio-economic perspective by developing a socio-economic profile of the TB patients based on the data gathered by the study. The third chapter provides the study findings regarding TOR objective: 1-the utilization of DOTS services. Chapter 4 analyses TOR objective 2-the treatment costs incurred by the patients and throws light on the level and pattern of the patients' private costs. Chapter 5 provides study findings regarding TOR objective 4—the crisis coping strategy adopted by the study TB patients to cope with the crisis triggered by the onset of TB. Chapter 6 discusses study findings on the nature of the perceived and real gender inequalities encountered by the study female TB patients on account of their illness. Chapter 7, the concluding chapter, brings together the various chapter findings and the broad conclusion arising out of the chapter specific analysis and data and identifies some relevant recommendations.

NTP and the DOTS Strategy to fight TB in the country:

1.04   To control TB and help the poor in fighting the disease the Government of Bangladesh is implementing a National Tuberculosis Control Program (NTP) since 1993 with assistance from the World Health Organization (WHO) and a consortium of donors. NTP is fully integrated with the National Communicable Disease Program of the Essential Services Package (ESP) of the Health and Population Sector Program (HPSP) and is financed by the GOB and the World Bank and other development partners.

1.05   The goals of the program are to reduce mortality, the risk of transmission and the disease burden of TB in the country so that TB is no longer a debilitating health hazard particularly for the poorer section of the country's population. Poverty, illiteracy and ignorance about the symptoms of the disease generally act as barriers to early detection and also

seeking the state-of-art effective treatment of TB particularly by the poor in the country. The basic objectives of the NTP are to raise the detection rate and the rate of cure by achieving a detection rate of 70% of the infectious cases of TB in the country and a cure rate of 85% of the detected infectious cases. NTP also aims at enhancing treatment completion rate by reducing default and discontinuance rates of the patients under treatment.

1.06   To achieve the program objective and to enlarge the access of the poor patients to the effective TB treatment regimen NTP is pursuing community-based DOTS (Directly Observed Treatment-Short Course) strategy developed by WHO, which is regarded as the state-of-the-art effective treatment for TB in poor developing countries. DOTS strategy consists of five program components:

- Commitment of the GOB to the TB eradication strategy through sustained political and financial support;
- Identification of infectious TB cases;
- Standardized short-course treatment of less than one year duration under direct observation for the identified patients;
- Ensure uninterrupted supply of drugs to avoid disruption of services and prevent secondary defaults; and
- Maintain patient registration system and follow-ups to prevent defaults and reduce incompletion rate. Monitor treatment of patients and program performance to ensure uninterrupted operational support of GOB and NTP.

1.07   Currently, DOTS is providing community targeted services that are generally delivered through the nationwide network of public sector health care facilities. The program has extended to both rural and urban areas. The current (March 2002) spread of the DOTS based program nationwide is as follows:

Rural areas:

- Available in all the 460 Upazilas. In 219 Upazilas, the program is operated directly by the GOB from the Upazila health complexes. In 241 Upazilas, DOTS is run in collaboration with 6 Non-Government Organizations (NGOs).

Urban areas:

- 25 urban DOTS Units in Dhaka Metropolitan City
- 31 DOTS Units in Chittagong Metropolitan City
- 10 Urban DOTS Units in Khulna Metropolitan City
- 13 Urban DOTS Units in the Rajshahi Metropolitan City

National level:

- 44 Chest Clinics
- 8 TB Segregation Hospitals attached to the chest clinics
- 4 TB Hospitals (at Chittagong, Khulna, Rajshahi and Sylhet)

GO-NGO Collaboration in NTP

1.08   To facilitate nation wide coverage of the NTP GOB has development effective partnership with a number of Non Government Organizations (NGOs), who are collaborating with GOB in targeting and delivering DOTS to the poor TB patients at the grass root level. Beside the 6 NGOs currently delivering DOTS in 241 Upazilas, 20 more NGOs are engaged in

DOTS delivery in urban areas that include Dhaka, Chittagong, Khulna and Rajshahi Metropolitan cities. Operating among the target group at the grass root level NGO programs complement the GOB service delivery by detecting smear-positive (infectious) TB cases bringing them under the short course therapy, arrange supply of essential drugs and develop patient follow–up and reporting system and data base. NGOs are particularly active in tracing out treatment defaulters and spreading health education among the general population. Diagnostic service and treatment care is also available from urban clinics and specially trained private physicians operating mostly in urban areas.

Study Purpose and Objectives

1.09   Although there is some information on the epidemiology of TB in Bangladesh, there is little information on the economic impact of TB on the poor. Also there has not been any study on the utilization of the services provided by the DOTS network by the poor TB patient and their socio-economic characteristics to obtain feed backs for policy purposes. To obtain a general assessment of the services provided by the DOTS and socio-economic characteristics of the patients treated, WHO and the Health Economics Unit of the Ministry of Health & Family Welfare of the GOB commissioned the study in one rural district (Rangpur) and one urban center (Chittagong city). The study was carried out by CDS-a private research organization in the months of August and September 2001 on the basis of random samples of 339 registered Smear +ve DOTS TB outpatients-182 from Rangpur and 157 from Chittagong. The Rangpur Sample was selected by randomization of patients registered in five DOTS centers located in four Upazila health complexes and one chest clinic. The Chittagong sample was a randomized selected from the TB outpatient registers of eight city dispensaries and one chest clinic.

1.10   The study utilized program-based outpatients rather than community based random sample, which was not feasible to carry out due to fund limitation and, therefore, not a part of the agreed study methodology. In spite of this limitation, randomization procedure ensured an unbiased selection of study patients so that study findings can help strengthen some aspects of the on-going TB control program executed through the DOTS strategy.

The Study objectives

1.11   As set out in the TOR, the broad objective of the study was to measure the access of various categories of patients to the DOTS TB service provided at different service locations both under government and non-government management, and assess the impact of TB on different socio-economic groups, particularly the poor and the women. The specific objectives of the study were:

- To measure the utilization of DOTS TB services particularly by the poorest.
- To estimate the treatment cost incurred by TB patients' households.
- To estimate economic losses (mainly loss of productivity) suffered by households of different socio-economic groups (measured by different income groups) due to morbidity and mortality due to TB.
- To identify the coping strategies of households with respect to economic losses due to TB.
- To examine the gender inequality in terms of seeking DOTS TB treatment care, accessibility and household expenditure during illness.

Study Instruments

1.12   With a view to collecting the required information following the TOR the following five study instruments were developed after thorough pre-testing in actual field conditions:

- Instrument 1: for gathering socio-economic information of the current TB patient, the type and quality of services received from DOTS centers, and cost of treatment incurred by the patients;

[¨]   Instrument 2: for gathering information on program defaults and past patients;

[¨]   Instrument 3: for gathering information on the DOTS service facilities including diagnostic facilities available at the service centers and medicine provided to the patients;

[¨]   Instrument 4: for gathering patient data from patient register and other records maintained at the service centers; and

[¨]   Instrument 5: for gathering patient addresses for household survey according to randomized sample patients.
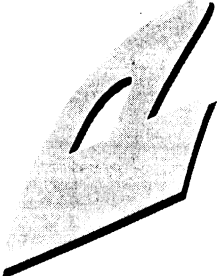
Methodology of data collection

1.13   Following the TOR the study carried out a random survey of current TB outpatients registered at the designated tertiary, secondary and primary facilities providing DOTS services and collected information with the help of the study instruments. Detailed Information was collected on the socio-economic characteristics of the patients, treatment costs, the disease burden coping strategy and access to facilities and other related subjects. The methodology of data collection and the uses of the study instruments are summarized below:
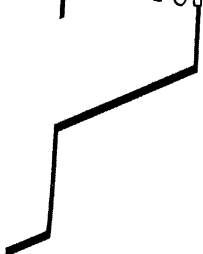
[¨]   The urban survey was conducted in Chittagong Metropolitan Area where DOTS services are provided through City Corporation Urban Dispensaries, GOB urban dispensaries and a few NGO dispensaries. One tertiary, one secondary and eight primary facilities were surveyed and a random sample (of the required size) of the current TB patients was selected from each of the facilities surveyed. Out of 219 registered smear +ve TB patients in the year July 2000-June 2001, 157 patients were interviewed. Sampling fractions in Chittagong was 0.72.

[¨]   The rural survey was conducted in Rangpur where one secondary and four primary facilities located at four rural Upazila Health Complexes were surveyed and, as in Chittagong, random samples of the current TB patients were selected from each of the facilities surveyed. Out of 470 registered smear +ve TB patients in the year July 2000-June 2001, 182 patients were interviewed. Sample fraction in Rangpur was 0.39.

[¨]   From each facility, both urban and rural, information of the type and volume of DOTS TB care provided and characteristics of the facilities were collected.

[¨]   The samples of TB outpatients selected from the facilities surveyed were interviewed and the required information were collected through the study instruments 1 and 3. The information related to the socio-economic characteristics of the patients and their households, duration of the disease, preferred services provider, outreach providers, both traditional and modern who were consulted before seeking DOTS treatment, use of private providers, information regarding DOTS services, waiting time, travel time and costs along with distance of their household from the DOTS facilities.

[¨]   Information relating to economic burden of the disease on the patient households were collected using the study instrument, which included information on cost of treatment, loss of work days due to illness, the coping measures adopted to cope with the loss of income and the financial liability accruing from the disease.

[¨]   Information regarding perceived impact of the illness and social discrimination were also collected. In case of female patients information on the impact of the illness on their household work and intra-societal discrimination faced (perceived or real) were also collected.

- Information was also collected on suspected patients, defaults from DOTS TB program and past patients.

- Information regarding provision of DOTS services, problems encountered and behavior of the under-treatment patients was collected through a separate questionnaire.

- To obtain patients' opinions regarding impact of TB and social discrimination four focus group discussions (FGD) were held with the poor patients in Chittagong.

Chapter 2

Socio-Economic Profile of the Study TB Patients

Chapter 2

Socio-economic profile of the Study TB patients

Summary of Chapter Findings

[1] The study shows that an overwhelming majority (70%) of the current patients undergoing DOTS treatment were poor and had income below the area specific poverty lines (of Tk.582 per person per month or 19 Taka per day per person in rural Rangpur and Tk.971 per month or 32 Taka per day per person in Chittagong metropolitan city: Household Income and Expenditure Survey 2000: BBS December 2001)

[1] 61% of the study patients were found to be absolutely poor and had income less than lower national poverty line (of Tk.582 per person per month: BBS which is less than one dollar a day.)

[1] The study found 64% of the study patients to be males suggesting a gender selective infection process at work and that poor working age males generally face relatively greater risk of TB infection. This may also point to the difficulties of identifying poor adult female TB patients in the country due to various socio-cultural and other inhibiting factors.

[1] Average age of the male study patients was 38 years and that of female patients was 28 years.

[1] Age distribution pattern of the study patients showed that TB affected both male and female patients at the prime of their working lives disrupting working ability and income earning. As a consequence, the burden of the disease often grows by life shattering proportions. Although based on a small sample, the study finding is in line with the global finding that records that 75% of TB infections occur in the 15-54 year age group, the most economically productive age group in the population (Macroeconomics and Health: Investing in Health for Economic Development: WHO December 2001).

[1] The majority of the rural TB patients were found to be agricultural day laborers and marginal farmers. The urban patients were engaged in various low-income services such as rickshaw pulling, petty trading etc.

[1] Most of the poor patients were found to reside in poor (kutcha) houses with little sanitary facilities and electricity but had access to tube well water for drinking purposes.

[1] Compared to the majority of the poor patients, the minority of the non-poor patients was found to reside in relatively better sanitation facilities and access to electricity and safe water.

[1] The asset ownership pattern (measured by the ownership of land, house, and bicycle television, radio etc.) of the minority non-poor patients was also found to be somewhat better than those of the poor patients.

[1] Majority of the patients (poor or non-poor, urban or rural) were found to be illiterate and without any formal education.

[1] 68% of the study patients were married, majority of them were poor and illiterate and reported compulsions for working outside of home in addition to regular household works.

The study was an exploratory survey and following the TOR objectives tried to explore the links of TB with poverty in the country and their implications for the poor TB patients. The focus of data collection was, therefore, multidimensional and involved collection of the key demographic, economic and social data together with data on the quality of the DOTS services the study patients were receiving and other related information. Majority of the TB patients in the study was found to be poor judged by their income and other indicators such as ownership of land etc. The observed monthly per capita income of majority (64%) of the study patients was less than the national (upper) poverty line income (of Tk.718 per month). This chapter develops poverty focused socio-economic profiles of the study TB patients based on the demographic, economic and social data that were collected and provides a socio-economic perspective to the subsequent analysis.

2.02   The demographic data gathered by the study include data on the patients' age, gender, marital status, household size, and relationship with the household heads (whether the patient was head of household or not), demographic dependency and literacy status.

2.03   The economic data consist of the income of the patients' households, their occupation, sources of income and earning, ownership of land (non-homestead land) and dwelling house and other economic assets and selected consumer durables and the pattern of daily food intake.

2.04   The social data included the type of the patients' dwelling houses and sanitation, access to safe water and electricity. A focus group discussion (FGD) was also arranged with the poorer section of the urban patients of Chittagong city to obtain their opinions on gender discrimination, economic burden of their illness and the quality of their current treatment from DOTS. The FGD data, although qualitative in nature, complement the socio-economic data that were collected.

2.05   The key indicator used for developing the patient profile was their per capita monthly income. Since the household monthly income of each patient household was collected, dividing the household income by the household size, the per capita income of every study patient could be obtained. The enumerated incomes, however, should be treated with caution and should not be taken as giving a true measure of the income of all TB patients and also giving the exact measure of true income of the study patients because of two reasons: first, the sample size was rather small and not a community based household sample, therefore, not a representative sample of the TB patient population of the country; second, due to recognized and well known difficulties in estimating income through direct interview in Bangladesh due to deliberate distortion of income information by the respondent, failure to correct enumeration of income from self employment or income received in kind etc. No two patients came from the same household and the sample patients could be treated as fairly independent. This also made the computation of per capita income of the patients simpler. Comparing the per capita income with the area specific poverty lines of the Bangladesh Bureau of Statistics (BBS) the study patients were divided into poor and non-poor groups.

2.06   Since the two study areas differed significantly with respect to pattern of consumption and level of living, one predominantly rural and the other urban, use of one single poverty line e.g. the national poverty line was obviously inappropriate. Instead, the geographic or area specific poverty lines recently estimated by the BBS from the 1999-2000 nationwide household income and expenditure survey were used for separating the study patients into poor and non-poor groups in the two study areas. The overall estimates of poor and non-poor patients were obtained by adding the respective estimates from the two areas.

2.07   For each area BBS provides two estimates of the poverty lines-the upper and the lower. The BBS poverty lines are CBN or the cost of basic needs poverty lines that allow for the costs of basic food needs and non-food consumptions. The lower poverty lines include the cost of basic food needs and a minimal allowance for non-food goods. The upper poverty lines include the same cost of basic foods with a more realistic allowance for non-food spending. In both areas, the use of the upper poverty lines was thought to be more appropriate. Sensitivity analysis using both the upper and the lower poverty lines and also the national poverty line did not show significant differences in the estimated numbers of the poor and non-poor patients in the two areas. Judged by the levels of prices and the consumer spending patterns in the two study areas, the selected upper poverty lines in the two areas can be regarded as equivalent to the PPP (purchasing power parity line) one dollar a day poverty lines.

2.08   The first patient profile is based on poor and non-poor comparison of the demographic, economic and social data. The analysis also provides disaggregation by gender and the two study areas wherever relevant.

2.09   The second profile focuses on the distributional aspects of the patients' demographic, economic and social status. By dividing them into income ranked quintile groups (or 5 equal groups of patients, each group comprising 20% of the total patients, each patient being arranged individually in ascending order of per capita income). The quintile grouping provides a relative comparison of the patients' status. Since the number of the study patients was rather small (339), it was thought that quintile grouping would be more meaningful than the larger decile grouping (10 equal groups). Quintile group analysis was supplemented by several relevant Lorenz curve analyses and computation of Gini coefficients, which provided measures of the distributional inequality of the selected study indicators.

Patient Profile: poor-non-poor comparison

2.10   Poor- non-poor comparison was carried out on the basis of the patients' demographic, economic and social characteristics.

Demographic characteristics of the poor and non-poor patients

2.11   The following table provides the basic demographic characteristics of the study patients:

Table 2.1:   Demographic characteristics of the study patients

Demographic Indicator	Poor	Non-poor	Total	Non-Poor - Poor Ratio
Average age (Year)	34	36	34	1.1
Average age of the male patients	37	40	38	1.1
Average age of the female patients	28	28	28	1.0
% Females	38	33	36	0.9
% Married	70	62	68	0.9
Average household size	5	6	5	1.3
% of patients who were the head of the households	48	40	46	0.8
% of female patients who were the wives of head of the households	24	17	22	0.7
Average no. of dependents per household	2	1	2	0.8

2.12   The variations of the demographic indicators among the poor and the non-poor groups are indicated by the non-poor poor ratios (or the rich-poor ratio as designated in some tables later) given at the end of the table. Average age of the patients was observed to be 34 years; the poor patients were slightly younger with average age of 34 years compared to the non-poor patients whose average age was found to be 36. A little more than one third (36% of the total) of the patients were females. Majority of the study patients were married and the proportion of married was much higher (70%) among the poor patients compared to the non-poor patients (62%). However, a larger proportion of the poor patients (48%) was head of

household compared to the non-poor patients (40%). Although the average household size of the poor patients was somewhat smaller (4.58) compared to the non-poor, the average number of dependents (demographic dependence) of the poor patients was slightly higher than the non-poor. The selected demographic data indicated that majority of the TB patients, both poor and non-poor alike, were at the prime of their working age and nearly two-thirds of the TB patients were males, suggesting gender–selectivity in the disease process. The quintile distribution of the patient's demographic variables brings out the pattern of the variations among the quintile groups but presents a similar pattern as in poor-non-poor comparison.

Table 2.2: **Quintile distribution of the study patients by selected demographic variables**

Quintile	Average age (year)			Percentage of female	Percentage married	Av. Household size	Percentage head of the household	Percentage wife of HH
	Male	Female	All					
1st	42	33	39	34	71	4.3	66	16
2nd	39	29	35	35	82	4.8	49	32
3rd	36	25	32	34	69	4.4	44	21
4th	37	27	33	41	63	5.3	43	24
5th	38	27	34	37	52	6.3	27	16
Total	38	28	34	36	68	5.0	46	22
Rich-Poor Ratio	**0.9**	**0.8**	**0.9**	**1.1**	**0.7**	**1.5**	**0.4**	**1.0**

Fig. 2.1: Rich-poor ratio of age, HH size & marital status of study patients

2.13   The Study collected selected data on the literacy and educational status of the sample TB patients, which are broad indicators of their occupation and income earning pattern and social motivations. The literacy and educational status of the study TB patients were analyzed by poor and non-poor categories and also by the quintile groups with gender disaggregation. The results are tabulated in Table 2.3 (poor- non-poor comparison) and Table 2.4 comparison by quintile groups) below: In table 2.4 a comparison was also made between the first and the fifth quintile observations, designated as rich-poor ratio to bring out the extent of divergence between the observations in the first (designated as the poor group) and the fifth quintile (designated as the rich group in terms of household income). Similar rich-poor comparisons have also been in other quintile tables later.

Table 2.3:   Literacy and educational status of the study TB patients (Poor non-poor comparison)

Patient group	Percentage (%) of the patients								
	Illiterate/No formal education			Primary level Education			Secondary and higher level education		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Poor	63	61	62	11	28	17	26	11	20
Non-poor	39	32	37	16	24	18	45	44	45
Total	56	53	55	13	27	18	32	20	28
Non-poor-Ratio	**0.6**	**0.5**	**0.6**	**1.5**	**0.8**	**1.1**	**1.7**	**3.9**	**2.2**

Table 2.4:   Distribution by quintile groups

Quintile	Illiterate/No formal education			Primary level education			Secondary and higher level education		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
1st	67	74	69	18	26	21	16	0	10
2nd	75	71	74	0	25	9	25	4	18
3rd	58	57	57	16	26	19	27	17	24
4th	38	43	40	20	32	25	43	25	35
5th	38	24	33	10	24	15	52	52	52
Total	56	53	55	13	27	18	32	20	28
Rich-Poor Ratio	**0.6**	**0.3**	**0.5**	**0.5**	**0.9**	**0.7**	**3.4**	**-**	**5.1**

Fig. 2.2: Rich-poor ratio of education level of the study patients
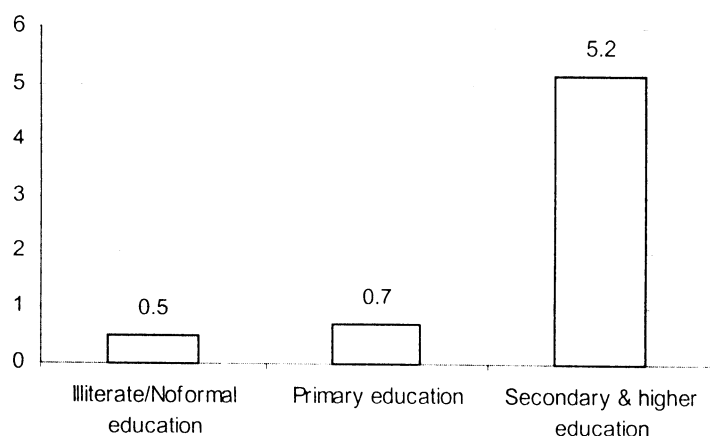
2.14   Majority of the poor TB study patients – both male and female- were illiterate and without any formal education (63% poor male and 61% poor female patients). Majority of the non-poor patients, on the other hand, were literate and 62% had primary or higher level education. Level of literacy and educational attainments of the study patients seem to have a strong positive correlation with their income status. This is brought out from the distribution of the study patients by quintile grouping. Quintile analysis shows that with the rise in per capita income the level of literacy and educational attainments of both male and female patients climbs up through the successive quintile groups.

2.15   Per capita income is the key factor used in determining the poverty status of the study patients. As mentioned earlier, per capita income (monthly) was derived by dividing the observed monthly family income of the study patients. Average per capita monthly income of the study patients was around Tk.681, which was below the national poverty line of Tk.718. Nearly 70% or broadly, the first three quintile groups of the study patients, were poor having per capita monthly income below the poverty line. Comparison of the patients of the two study areas shows that the patient group Rangpur (a predominantly rural area) was found to be the 69% poor (below the poverty line) and the group of the urban city of Chittagong was found to be 71% poor (below the poverty line). Overall, the male and female patients as a group seem to be equally divided into poor and non-poor categories.

2.16   Distribution of the poor and non-poor patients by gender of the two study areas along with the average per capita income of the poor and non-poor are shown in the following tables (tables 2.5 and 2.6):

Table 2.5:   Percentage of Study TB patients by Poor-Non-Poor, gender and area

Group	Rangpur			Chittagong			All		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Poor	69	67	69	66	76	71	68	72	70
Non-poor	31	33	31	34	24	29	32	28	30
Total	100	100	100	100	100	100	100	100	100

Table2.6:   Average per capita monthly income of male and female patients by quintile

Group	Rangpur			Chittagong			All		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Poor	293	304	295	605	621	613	410	508	445
Non-poor	978	1037	997	1138	1361	1216	1048	1189	1095
Total	529	629	556	822	828	825	647	745	681
Non-poor-Poor Ratio	3	3	3	2	2	2	3	2	2

2.17   The overwhelming majority (70%) of the study patients in both Rangpur and Chittagong were poor. Overall, nearly 70% of the study patients were poor and 30% non-poor.

2.18   Distribution of the household and per capita (monthly) income of the study group patients are shown in the following tables. The degrees of inequalities in the two distributions are shown by the respective Lorenz curves and the corresponding Gini-coefficients. Gini-coefficient is an indicator of inequality of the distribution of different variables over the individuals. The smaller is the Gini-coefficient the smaller is the inequality of distribution and vice-versa.

Table 2.7:   Distribution of the study patients' household monthly income

Income level (Taka)	Rangpur		Chittagong		All	
	No.	%	No.	%	No.	%
Below 1000	36	20	5	3	41	12
1000 – 1500	49	27	15	10	64	19
1500 – 2000	20	11	12	8	32	9
2000 – 3000	28	15	43	27	71	21
3000 – 5000	23	13	48	31	71	21
5000+	26	14	34	22	60	18
Total	182	100	157	100	339	100

N. B. Upper limit of the class is included

Fig 2.3: Distribution of patients' HH monthly income
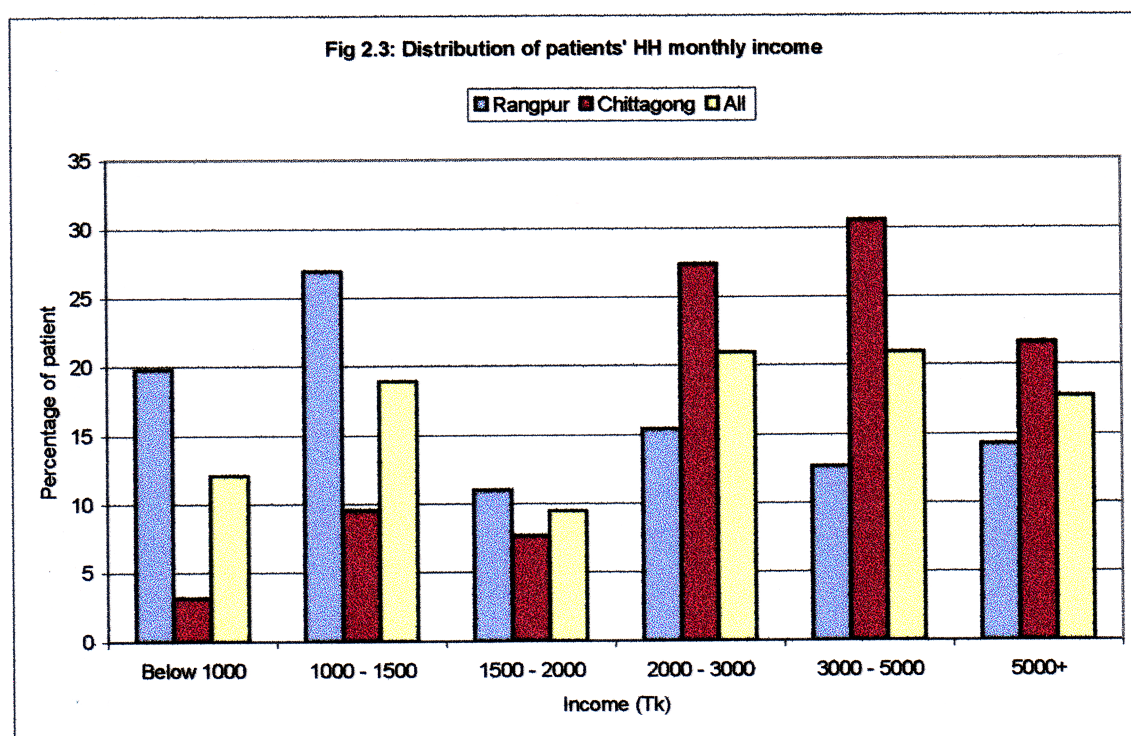
Fig. 2.4 : Lorenz curve of patient household income (Overall)
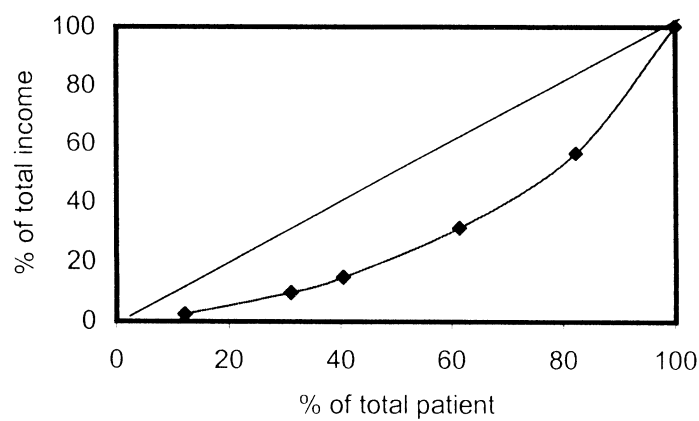
Gini Coefficient: 0.39

Fig. 2.5 : Lorenz curve of monthly household income (Rangpur)
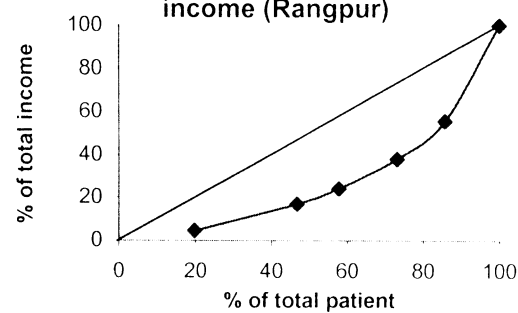
Gini Coefficient: 0.45

Fig. 2.6 : Lorenz curve of household monthly income (Chittagong)
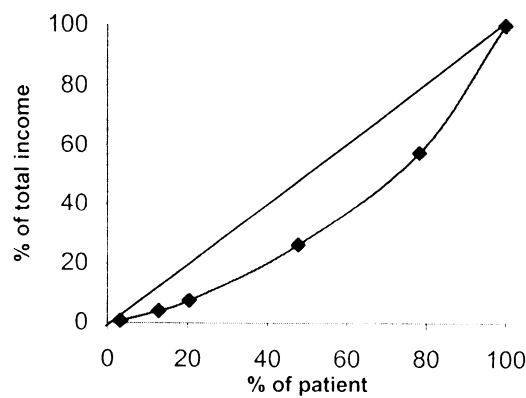
Gini Coefficient: 0.30

The inequality in the two income distributions is brought out in the following figure. The patients from rural Rangpur are relatively poorer compared to the patients from urban Chittagong.

2.19 The main sources of household income of the study patients were occupational income augmented by net income from land and other properties and net transfer income. In the predominantly rural area of Rangpur the main occupation of the study patients was agricultural day labor. In urban Chittagong city the main occupation of the study patients was non-agricultural day labor (rickshaw pulling or casual industrial labor). The distribution of the major income sources by the quintile groups compared to household income and ownership of land and other assets such as dwelling house is shown in the following tables. In order to bring out the major occupational differences and the sources of household income the quintile distributions of the two study areas are shown separately along with the aggregated distribution.

Table 2.8: **Household and per capita income, the sources and ownership of assets of the study TB patients by quintile groups**

District	Quintile	Av. monthly income per HH (Tk)	Av. monthly per capita income (Tk)	Av. own land per HH (acre)	Percentage of income from agril. activities and land	Percentage of income from non-agril. activities	Percentage of HH owning dwelling house	Major Occupation
Rangpur	1st	837	230	0.1	82	18	75	Agril. Day labor
	2nd	1633	359	0.4	59	41	60	Agril. Day labor
	3rd	2508	609	0.5	39	61	37	Agril. Day labor
	4th	3831	725	0.7	52	48	29	Trade
	5th	8647	1557	2.3	48	52	37	Farmer
	Total	2776	571	0.6	53	47	48	Agril. Day labor
	Rich-Poor Ratio	10	7	27	1	3	0	
Chittagong	1st	700	176	0.0	0	100	0	Other Service
	2nd	1664	488	0.0	2	98	3	Day labor
	3rd	2781	782	0.1	3	97	6	Service
	4th	4011	928	0.1	3	97	15	Service
	5th	7605	1364	0.2	7	93	22	Service
	Total	4136	906	0.1	5	95	9	Day labor
	Rich-Poor Ratio	11	8	-	-	1	-	
Overall	1st	825	226	0.1	79	21	75	Agril. Day labor
	2nd	1645	406	0.2	56	44	63	Agril. Day labor
	3rd	2669	710	0.3	31	69	43	Trade
	4th	3950	859	0.3	29	71	44	Farmer
	5th	8009	1439	1.0	31	69	60	Service
	Total	3406	726	0.4	35	65	57	Agril. Day labor
	Rich-Poor Ratio	10	6	13	0	3	1	

Fig. 2.7 Rich-poor ratio of HH income, per capita income & HH own land
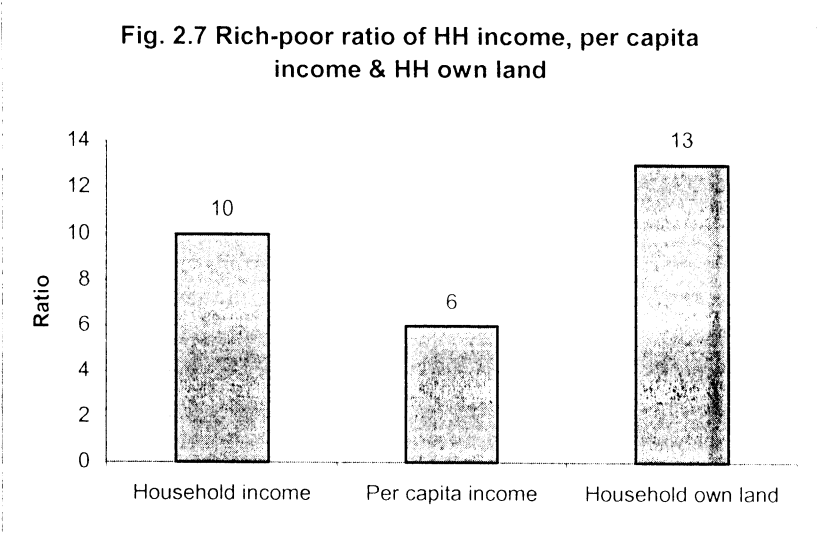
The poverty of the study patients is manifest in the asset holding, as well in their income and occupation. Land holdings of all the quintile groups were tiny and except the fifth quintile all the four quintile groups were, in fact, functionally landless i.e. owning land less than 50 acre, which is considered under Bangladesh situation inadequate for subsistence. Meager though the land holdings were, the pattern of land ownership was highly inequitable as the Lorenz curves and the Gini coefficients of land ownership of the two study areas as as the overall ownership patterns show.

To analyze the proximate determinants of household income of the study patients (near) regressions were run with the monthly household income as dependent variable and a few selected variables, such as household size as proxy for the number of earners, level of education of the patients as proxy for earning capability, amount of household land owned as proxy for household productive asset holdings and age of the patients as proxy for earning level. Of the explanatory variables, only education was found significant. The others came out to be insignificant. The signs of all the explanatory variables were found positive except age, which came out to be negative in case of Rangpur and overall. It was positive in Chittagong. This signified that after a threshold level, the earning power of the study patients in rural setting like Rangpur seemed to decline with increase in age, other factors being held constant. Results of the regression analysis is summarized below:

Results of the regression analysis of the proximate determinants of the income of the study patients:

Table 2.9 : Results of the regression analysis

Study areas and overall	Constant term	Household size	Patients, education	Household land	Patients' age	R^2	Level of significance
Rangpur	404	25	149	11	-3	0.40	Significant
Chittagong	1356	415	83	9	7	0.19	Not signi.
Overall	1189	363	125	8	- 12	0.27	Not signi.

Table2.10:   Distribution of HH own land in the study areas

Land (dec)	Rangpur		Chittagong		Total	
	Number	%	Number	%	Number	%
0 - 5	113	62	131	82	244	72
5 - 25	13	7	7	5	20	6
25 - 50	8	4	14	9	22	7
50 - 150	21	12	3	2	24	7
150 - 250	14	8	1	1	15	4
250 and above	13	7	1	1	14	4
Total	182	100	157	100	339	100

Fig. 2.8 : Lorenz curve of patient houehold own land (Overall)
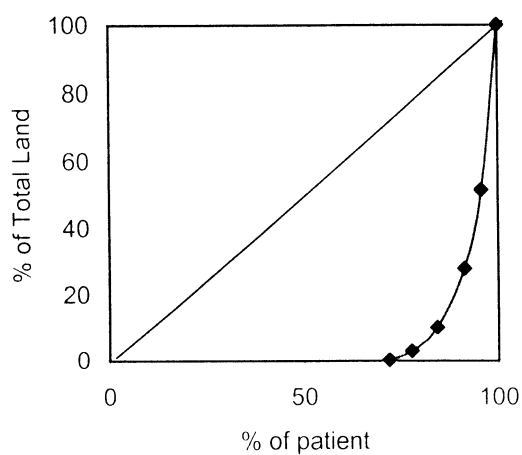
Gini Coefficient: 0.86

Fig. 2.9 : Lorenz curve of household own land (Rangpur)
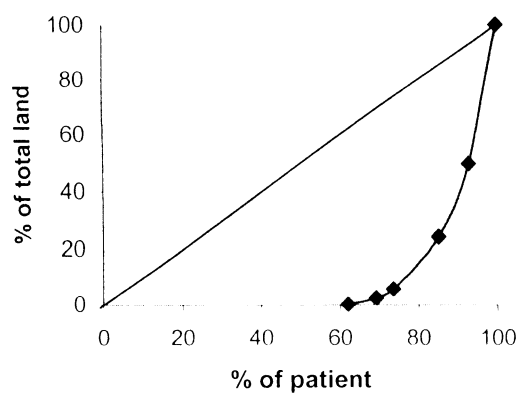
Gini Coefficient: 0.77

Fig. 2.10 : Lorenz curve of household own land (Chittagong)
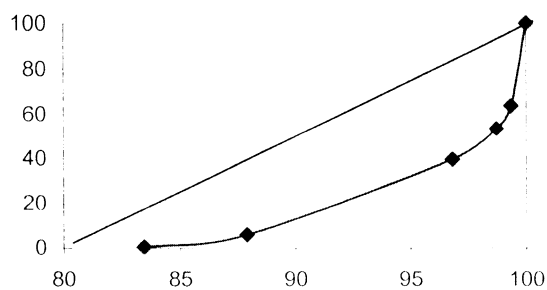
Gini Coefficient: 0.87

2.23   The condition of housing, sanitation and ownership of some selected common consumer durables (such as radio and television) and access to electricity of the study TB patients also depict the general poverty of their lifestyle and their level of living. The following quintile table provides the relevant picture:

Table 2.11:   **Quintile distribution of the status of the Study patients' housing condition, sanitation, access to electricity and water, and ownership of selected common consumer durable by study areas:**

Quintile	Housing condition (%)				Sanitation (%)		Access (%)		Consumer durables (%)	
	Kutcha	Semi-pucca	Pucca	Slum like	Adequate	Inadequate /open space	Safe water	Electricity	Radio	Television
1st	85	1	0	13	15	85	100	9	5	2
2nd	74	6	7	13	47	53	99	21	14	6
3rd	63	7	9	21	57	43	94	44	24	5
4th	66	18	10	6	78	22	90	61	21	24
5th	46	21	24	9	85	15	96	76	49	45
Total	67	11	10	12	56	44	96	45	24	19
Rich-Poor Ratio	1	14	-	1	6	0.2	1	8	11	29

2.24   With the help of the data and analysis provided in this chapter we can now build up a socio-economic profile of the average male and female study TB patient as follows:

Profile of the average study Male TB patient

Age:	38 years
Marital status	Married
Household size	4.5
Demographic dependence	2
Occupation:	Day labor
Literacy status	illiterate
Years of schooling:	
Monthly Income:	Tk. 647
Poverty status:	Poor
Ownership of:	
Land	Functionally landless
Dwelling house	Owns
Common consumer durables	none
Status of housing:	Kutcha structure
Access to:	
Electricity	No
Safe drinking water	Yes
Household sanitation	Nil

Profile of the average study Female TB patient

Age:	28 years
Marital status	Married
Household size	4.5
Demographic dependence	2
Occupation:	Household work
Literacy status	Illiterate
Years of schooling:	
Monthly Income:	Tk.745
Poverty status:	Poor
Ownership of:	
Land	Functionally landless
Dwelling house	Own
Common consumer durables	None
Status of housing:	Kutcha
Access to:	
Electricity	No
Safe drinking water	Yes
Household sanitation	Nil

Chapter 3

Utilization of DOTS Services by the Study TB Patients

Chapter 3

Utilization of DOTS Services by the study TB patients

Summary of Chapter Findings

i.i Most of the poor and illiterate TB patients waited for nearly three months or more before they could contact DOTS and register for DOTS service.

i.i In absence of institutionalized outreach channel in the study areas, nearly 73% of the study TB patients reported seeking, mainly on economic grounds, low cost initial treatments from village quacks or homeopath and the like, the unsuccessful outcomes of which induced them to go for DOTS treatments.

i.i Only 27% of the study patients reported coming directly to DOTS center on their own.

i.i Once they were registered with DOTS, the study patients reported to be satisfied with the DOTS services and 87% of the study patients reported improvements.

i.i The average waiting time per study patient per trip was small and reported to be around 16 minutes.

i.i The study found that the average travel time to the DOTS center was around two hours in case of the rural area and three quarters of an hour in case of urban centers. The cost of travel was relatively high compared to the patients' income.

i.i Malpractices and delay in providing services at the DOTS centers were reported to be less prevalent and the study patients reported to be generally examined on schedule.

i.i Around 11% of the study patients, however, reported paying underhand money at some point of time to get the service from DOTS providers.

One of the objectives of the NTP is to make DOTS more accessible to the TB patients at the grass root levels in both rural and urban areas. The study investigated in broad terms the utilization by the study patients, particularly the poorer patients, of the services that are available from the DOTS centers covered by the study in Rangpur (representing rural sample) and Chittagong metropolitan city (representing the urban sample).

3.02 To assess the quality of services provided, the study also investigated the service facilities available at the DOT centers and the physicians and support personnel available at the centers for treatment and delivering patient care. Results of the study of utilization of DOTS are presented in this chapter.

Utilization of DOTS services by the study TB patients:

3.03 The study shows that an overwhelming majority (70%) of the current patients undergoing DOTS treatment were poor and had income below the area specific poverty lines of Tk.582 per person per month or 19 Taka per day per person in rural Rangpur and Tk.971 per month or 32 Taka per day per person in Chittagong metropolitan city: Household Income and Expenditure Survey 2000: BBS December 2001)

Table3.1:   Percentage of Study TB patients by Poor-Non-Poor, gender and area

Group	Rangpur			Chittagong			All		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Poor	69	67	69	66	76	71	68	72	70
Non-poor	31	33	31	34	24	29	32	28	30
Total	100	100	100	100	100	100	100	100	100

3.04   Almost 100% of the study patients were found to be utilizing DOTS therapy. Tables 3.2 and 3.3 classify the DOTS patients by poor non-poor categories and by quintile groups. Although the rates of utilization in both the centers are high, utilization of the rural patients from Rangpur appear to be slightly less compared to the urban patients from Chittagong.

Table 3.2:   Poor-Non-poor comparison

Group	Percentage of DOTS patients		
	Rangpur	Chittagong	Total
Poor	98	100	99
Non-poor	98	100	99
Total	98	100	99
Non-poor-poor ratio	1	1	1

Table 3.3:   Quintile analysis

Quintile	Percentage of DOTS patients		
	Rangpur	Chittagong	Total
1st	97	100	97
2nd	100	100	100
3rd	100	100	100
4th	100	100	100
5th	96	100	99
Total	98	100	99
Rich-poor ratio	1	1	1

3.05   Patients in rural areas were found to cover greater distances to come to the DOTS centers compared to patients in urban areas. The study patients in Rangpur traveled on the average 7 kilometers to reach DOTS center compared to 2 kilometers on the average in case of Chittagong. This suggests wider hinterland or service area for the rural DOT centers compared to the urban DOTS. The rural hinterland of an average DOT center can be estimated to serve around 150,000 population with an expected TB patient population of around 350 of whom about half seem to be taking DOTS services currently.

3.06   Both the poor and the non-poor patients were found to cover almost the same distance on the average to get to the DOTS center and both categories of the study patients were found to use rickshaw as the dominant mode of transport to the DOTS center. Due to economic reasons, rickshaw use was higher by the non-poor patients compared to the poor patients both in rural and urban areas. A little more than 6% of the patients on average traveled on foot to get to the service centers - the proportion was higher for the poor than the non-poor in rural as well as urban areas.

3.07   Shorter distance induced the urban patients to travel more frequently to the centers compared to the rural patients. The former made, on the average, 5 trips a month to the DOTS centers compared to 3 trips by the rural patients. Average time spent in traveling to get the DOTS service was also less for the urban patients (0.7 hour per trip) compared to the rural patients (1.7 hour per trip). The poor non-poor comparison is provided in the following table.

Table 3.4:   Indicators of distance and travel to the DOTS centers

Indicators	Poor			Non-poor			All		
	Rang	Ctg	All	Rang	Ctg	All	Rang	Ctg	Total
Average distance of DOTS center in kilo meter	7	2	3	7	2	4	7	2	4
Transport mode in % : Rickshaw	91	97	93	94	96	95	92	97	94
:On foot	8	3	6	6	5	5	7	4	6
Monthly average Frequency of travel	3	6	4	4	4	4	3	5	4
Hours of travel per trip	1.7	0.7	1.3	1.6	0.7	1.1	1.7	0.7	1.2

Table 3.5:   The relative positions of the average distances of DOTS centers, travel time and patients' trip per month are shown in the following quintile analysis:

Quintile	Av. distance to service center (km)		Av. cost of travel per trip (Tk)		Time spent in reaching service center	
	Rangpur	Chittagong	Rangpur	Chittagong	Rangpur	Chittagong
1	6	2	28	43	1.8	0.9
2	7	1	26	30	1.6	0.6
3	8	2	28	38	1.8	0.8
4	7	2	31	36	1.4	0.7
5	8	2	35	24	1.8	0.8
Total	7	2	29	33	1.7	0.7
Rich-Poor ratio	**1.3**	**1.1**	**1.2**	**0.6**	**1.0**	**0.8**

3.08   The study found significant lead-time or delay on part of the study patients in contacting and seeking DOTS service. The delay was relatively greater among the rural patients than among the urban patients. It took nearly four months on part of both poor and non-poor rural patients (112 days for the rural poor to 109 days for the rural non-poor patients)

to contact and seek DOTS services. Only 27% of the study patients came directly to DOTS for treatment and the 73% of the study patients were referred to DOTS. Majority of the study patients, both poor and non-poor, were referred to DOTS by the local quacks, homeopaths or local clinics, who thus acted as outreach agents of DOTS.

3.09   Reasons for delays in seeking DOTS were further analyzed by poor non-poor, gender and by the level of education. The delay was found, in general, to be significantly higher on part of the poor patients compared to the non-poor ones. On the average, the poor patients were 40% slower compared to the non-poor in seeking DOTS service. No significant difference was found in the seeking pattern of DOTS service by gender or by the level of education. The relevant tables are provided in the appendix.

3.10   Lack of knowledge about the symptoms of TB, general illiteracy and lack of schooling, and natural aversions to adopt modern treatment regimen, which in general is presumed to be costly, motivated most of the study patients to seek cheaper but ineffective treatments initially. Presumably, it was the failure of the latter that had induced them to seek DOTS eventually. Once registered for the DOTS treatment, overwhelming majority of the study patients reported improvement. This is brought out by the following quintile analysis and poor non-poor comparison.

Table3.6:   **Quintile distribution of the status of the study patients under DOTS treatment**

Quintile	Patients coming directly to DOTS (%)	Patients referred to DOTS by others (%)	Days elapsing between contracting TB & seeking DOTS treatment	Average duration of disease (days)	Days under DOTS treatment	% of patients reporting improvement
1	16	84	100	236	135	82
2	21	79	95	207	112	88
3	24	76	94	191	97	85
4	37	63	68	198	130	90
5	37	63	73	211	138	88
Total	27	73	86	208	122	87
Rich-Poor ratio	**2.3**	**0.8**	**0.7**	**0.9**	**1.0**	**1.1**

Fig 3.1: Rich-Poor ratio of the variables - patients coming directly, referred, days elapsing, duration of disease & improvement
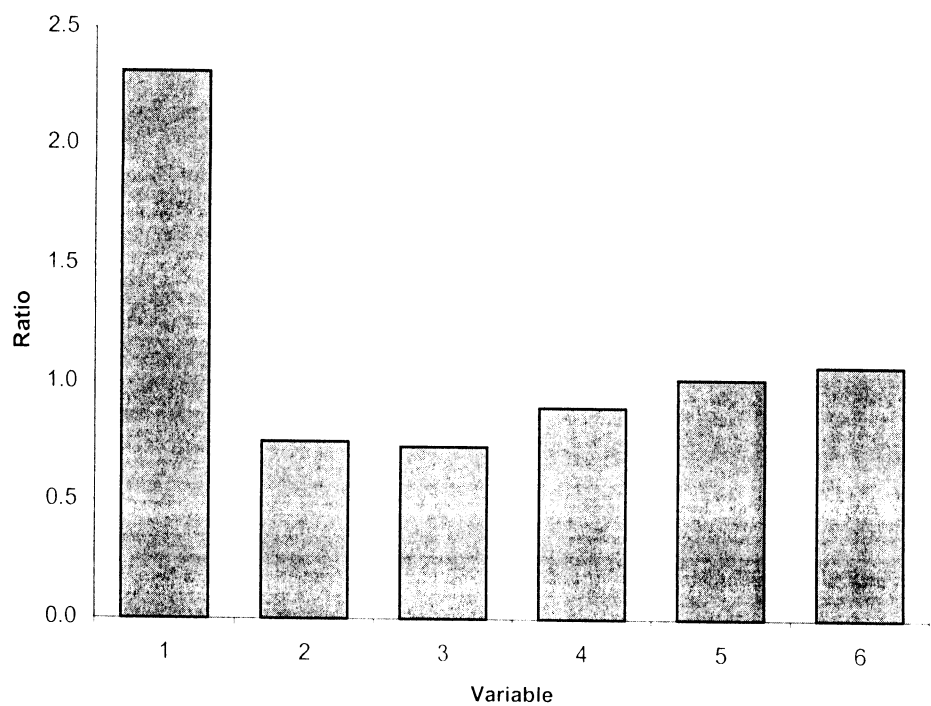
Legend (X-axis):
1. Coming directly
2. Patients referred
3. Days elapsing
4. Avg. duration of disease
5. Days under DOTS
6. Patients reporting improvement

Quality of DOTS service:

3.11   Quality of DOTS service was evaluated at two levels. First, by comparing improvement rate with non-improvement and deterioration rates. Second, by analyzing the proportion of the study patients not being able to collect medicine from DOTS and forced to buy from the market. The average duration of waiting time for receiving DOTS service was also analyzed as an indicator of service quality. The patients were also quizzed to obtain information on any underhand practice prevailing in the DOTS service. Gender discrimination in providing DOTS services was also explored by seeking patients and service providers' opinions. Patients' opinion in this regard was obtained through focus group discussion held with the study patients of Chittagong.

Table 3.7:   Improvement rates compared to rates of non-improvement and deterioration of the study patients

Patients group	% of patients reporting improvement				% of patients reporting no change	% of patients reporting deterioration
	Fast	Well	Slowly	Total		
Poor	3	43	40	86	13	1
Non-poor	3	51	35	89	11	0
All	3	45	38	87	12	1
Non-poor-Poor Ratio	1	1	1	1	1	0

Table 3.8:   Quintile analysis

Quintile	% of treatment receivers improving	% showing no change	% of patients deteriorating
1st	82	16	1
2nd	88	12	0
3rd	85	13	1
4th	90	9	1
5th	88	12	0
Total	87	12	1
Rich-Poor Ratio	**1.1**	**0.7**	**0.0**

3.12   The reported improvement rate of the study patients after they became receivers of the DOTS treatment regimen was high. Almost 90% of the study patients reported improvement. There were apparently no significant difference in the recovery rates between the poor and the non-poor groups as a whole. This is also evident from quintile analysis and from gender disaggregation.

3.13   Another indicator of service quality that was developed was the status of supply of the free medicine to the study patients from the DOTS. The proportion of the patients on the average (9%) not receiving the required supply of the medicine, the most vital element in the whole treatment process, and forced to buy from the market and the proportion of the patients missing the dosage were analyzed as indicators of quality of the DOTS service. The results are presented in the following poor- non-poor comparison (Table 3.9):

Table 3.9:   **Quality of DOTS service: Poor non-poor comparison of the status of the supply of medicine from DOTS**

Patients group	% of patients not supplied medicine from center	% of patients buying medicine from the market	% missing (residual)
Poor	9	6	3
Non-Poor	8	6	2
All	9	6	2
Non-Poor-Poor Ratio	**0.9**	**0.9**	**0.8**

3.14   On the average, nine percent (9%) of the study patients reported not receiving their regular supply of free medicine from the DOTS. The lapse of free supply was higher in the rural DOTS of Rangpur (10%) compared to the urban DOTS of Chittagong city. Also the poor patients, on the average, seem to have been slightly discriminated against in receiving the free supply compared to the non-poor mostly in the rural DOTS. About 6% of the study patients- the poor and the non-poor alike- who on the average did not receive the free supply had to buy from the market. Consequently, about 3% of the study patients were found to have missed their required dosage altogether, significantly all of them were found in Rangpur and none in Chittagong. The quality of the service, as assessed by the ability to meet the regular requirement of free supply of dosage, seems to be poorer in rural DOTS (of Rangpur) compared to the urban DOTS of the Chittagong city. The quintile analysis also presents the same picture. Disaggregation by gender also did not reveal any gender discrimination in the

free supply of medicine to the patients. This suggests failure of the central supply and logistics to anticipate and meet the grass root level demand on a sustained basis.

3.15   The average waiting time of the study patients per trip to receive DOTS service was also analyzed as an indicator of quality of the DOTS service and was found to be generally low, around 16 minutes on the average per study patient. This suggests non-clustering of the patients for service and a relatively small daily appearance of the TB patients compared to the general patients at the service centers. There was not much difference between the poor and the non-poor groups or between the genders in this regard. However, average waiting time appeared to be somewhat higher (by 18%) in the rural DOTS of Rangpur compared to urban DOTS of Chittagong city. The relevant poor non-poor comparison is presented in the following table (Table 3.10):

Table 3.10:   Average waiting time (in minutes) per trip per patients at DOTS service centers (Male-Female comparison)

Sex	Av. waiting time per trip (minute)		
	Rangpur	Chittagong	Total
Male	17	14	16
Female	18	15	16
All	18	15	16

Table 3.11:   Average waiting time (in minutes) per trip per patients at DOTS service centers (Poor non-poor comparison)

Group	Average waiting time per trip (minute)		
	Rangpur	Chittagong	Total
Poor	18	14	16
Non-poor	17	15	16
All	18	15	16
Non-poor-Poor Ratio	1	1	1

3.16   The prevalence of malpractice in the study DOTS centers was also probed and the study patients were asked to report (confidentially) whether they were required to pay underhand money to the providers for their DOTS services. Analysis of the responses is provided in the following poor non-poor comparison and quintile

Table 3.12:   Poor-Non-poor comparison of the study patients (%) paying underhand money for DOTS service

Patients group	Rangpur	Chittagong	All
Poor	12	9	11
Non-poor	10	13	12
All	12	12	12

Table 3.13:   Quintile analysis of the study patients (%) paying underhand money for DOTS services

Quintile group	Rangpur	Chittagong
1	20	0
2	7	4
3	0	8
4	17	18
5	4	15
All	12	12

3.17   Around 12% of the study patients reported paying underhand money to get DOTS services. The poorest in the rural area (around 20%) and the affluent patients in both rural and urban areas seem to have been affected relatively more in this respect. In Rangpur, the divergence between the rich (measured by the fifth quintile) and the poor (the first quintile) is particularly significant, where the poor patients reportedly had to pay five times more in underhand payments compared to the richer patients.

Gender discrimination in DOTS service:

3.18   The study did not find any evidence of open (deliberate) or concealed (covert) gender discrimination to the detriment of the female patients. The female study patients of Chittagong did not mention receiving any open discrimination in obtaining service from DOTS. Gender dis-aggregation of selected indicators such as waiting time, non-receipt of the required dosage from DOTS and payment of underhand money to get DOTS services, which could reveal the presence of covert gender discrimination, also failed to indicate any significant discriminatory treatment.

3.19   We can summarize the study findings on the utilization of DOTS services as follows: Nearly 73% of the study patients did not come directly to the DOTS center. Untrained village parishioners, quacks and homeopaths, under whose treatment they wasted, on the average, nearly three months, referred majority of them to the DOTS. Only 27% of the study patients contacted DOTS directly. Once they were registered with DOTS, they were satisfied with DOTS services and nearly 90% of them reported steady improvement.

3.20   Although the essential treatment facilities and the trained physician and support personnel seemed inadequate in the study DOTS centers, the centers were found to deliver regular TB treatment care of sizeable nature in addition to a large volume of general health care. The rural patients were found to travel on the average greater distance to get to the DOTS centers compared to the city based patients. Rickshaw was almost the universal mode of transport used both by the poor and non-poor. Because of the proximity of the DOTS centers, the urban patients were found to be making more frequent trips to the DOTS centers than the rural patients.

3.21   The quality of DOTS services was found to be of reasonable standard. Waiting time was short and majority of the study patients reported significant improvement after receiving DOTS treatment. The poor patients or the female patients did not seem to face open or covert discrimination in receiving DOTS services. The prevalence of malpractice was not significantly high and around 12% of the study patients reported paying underhand money for DOTS services, which seemed to have involved the poorest, and the more affluent quintile of the study patients relatively more.

Chapter 4

Cost of Illness

Chapter 4

Cost of illness

Summary of Chapter Findings

- Contacting TB was reported to be devastating for most of the poor patients in terms of loss of income and family welfare.
- For most of the study patients economic losses suffered on account of the disease calculated in terms of loss of workday due to inability to work and loss of income and earning were catastrophic.
- Almost all the patients reported fall in family income and earnings and costs of illness and food adding to family expenditures.
- Loss of working days (average loss was reported to be around five months per patient) added to the economic burden of the disease.
- Imputed economic losses including loss of earnings and added costs of illness seemed to be two to three times the diminished family income of the poor study patients.
- The catastrophic economic losses from TB arising from loss of productivity and added costs of illness seem to enhance the risks of pauperization for most of the poor TB patients.

- Comparison of the pre-and post illness income of the study patients show increase of poverty (measured by the headcount ratio) by about 20% due to illness from TB.

TB inflicts enormous economic burden on the patients and the patients' household. One of the TOR objectives of the study was to estimate costs of illness incurred by the TB patients' households. To estimate the costs of illness information on both direct (mainly out-of-pocket expenses) and indirect costs (maintenance expenses) were collected from the study patients' households through household survey. There is a third category of costs, which we have termed economic costs that arise from loss of productivity or working days lost by the study patients due to severity of the illness. Information on the number of working days lost and the value the patients would put to the lost days was collected by directly interviewing the patients. Economic losses are discussed later in the chapter.

4.02   The direct costs included the following categories of expenses:

Out-of-pocket or Direct costs of treatment:
- Travel costs for receiving DOTS treatment:
     -Patients' own costs
     -Travel cost of the persons accompanying the patients
- Physicians' fee
- Pathological Tests
- Medicine

Indirect cost:
Indirect costs include:
- Costs of the patients' diet
- Others
     -recurring of visiting relatives/friends
     -cost for privately appointed aya/nurses/attendants

Distribution of patients by duration of DOTS treatment:

4.03   To obtain a better perspective of the treatment costs, the patients at the study centers were distributed by the duration of their DOTS treatment or into eleven treatment cohorts as follows:

Table 4.1:   Treatment cost by treatment month and direct- referred patients

Treatment month	Total number of patients	Average treatment cost			
		Overall cost	Direct patients	Referred patients	Referred-Direct Ratio
1	30	1753	1100	2322	2
2	65	2203	1359	2460	2
3	43	2920	1594	3270	2
4	51	2835	1272	3151	2
5	38	3758	1607	4289	3
6	34	2573	2106	2501	1
7	25	3453	3061	3528	1
8	33	4051	1799	4552	3
9	16	3406	2096	3930	2

4.04   The patients coming to the DOTS centers directly for seeking services are defined as direct patients and those who preferred treatment from local doctors, village doctors, private clinics and hekim/kabiraj/herbal, etc before coming to DOTS centers to seek treatment are defined as referred patients.   The patients under DOTS receive free medicine during the normal duration of the treatment regimen, which is around 9 months. They also do not pay for the services of the physicians and the routine pathological tests. The study patients reported paying for medicine, services of the physicians, and special non-routine and expensive tests as out of pocket expenses. Also the patients referred to the DOTS by third parties reported paying for medicine, physicians' services and tests so long they were under non-DOTS treatment. The study indicates that the referred patients are subjected to bearing the cost, which is double the cost of direct patients. In some cases, this cost is triple the cost of direct patients.

4.05   Since more than 70% study patients are referred ones, resulting in extra costs on the part of TB patients, an ample scope remains to be explored further to help TB patients to reduce their costs and time by identifying these patients at the first instance and bringing them under DOTS coverage.

Fig4.1: Referred-Direct patient cost of illness of the study patients by treatment month
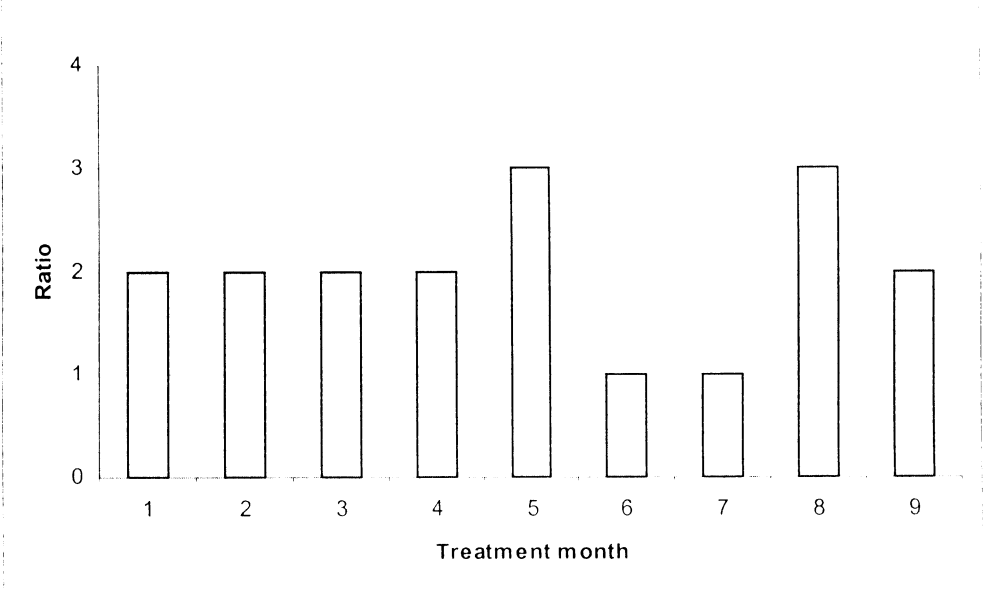
Components of Treatment Costs

4.06   The Costs were also disaggregated by the main components and the results of poor and non-poor comparison as well as quintile analysis are shown below: The study reveals that the patients' direct costs account for 68% and indirect cost account for 32% of the total costs. The cost for the poor and noon-poor is, however, almost equal.

Table 4.2:   Total average treatment cost of direct and referred patients by components

Type of patient	Total average cost of treatment	Direct cost as the percentage (%) of total treatment cost					Indirect cost as the percentage (%) of total cost		
		Doctor fees	Pathological cost	Medicine cost	Travel cost	Total Cost	Diet	Others	Total
Direct	2932	6	29	11	14	60	32	8	40
Referred	4003	12	17	27	13	69	21	10	31
All	3880	11	19	25	13	68	22	10	32
Direct-Direct Ratio	1.4	2.0	0.6	2.5	0.9	1.2	0.7	1.3	0.8

Table 4.3:   Total average treatment cost of poor-non-poor patients by components

Type of patient	Total average cost of treatment	Direct cost as the percentage (%) of total treatment cost					Indirect cost as the percentage (%) of total cost		
		Doctor fees	Pathology cost	Medicine cost	Travel cost	Total Cost	Diet	Others	Total
Poor	3540	11	20	23	14	68	23	9	32
Non-poor	4600	13	16	28	11	68	22	10	32
All	3880	12	18	25	13	68	22	10	32
Non-poor-Poor Ratio	1.3	1.2	0.8	1.2	0.8	1.0	1.0	1.1	1.0

Comparison of treatment expenses and diminished patient household incomes

4.07   Overall, the poor patients report higher cost compared to the non-poor patients of all the treatment cohorts. Comparison of the costs of illness with patients' household income shows that the costs of illness, particularly of the poor patients, are of catastrophic dimension (Wagstaff, World Bank: 2001). Heavy treatment expenses and the productivity (and related losses) on account of TB diminish the patients' household incomes, particularly the poor patients, significantly. Earlier in the study we had calculated the normal or pre-illness household incomes and used the calculations for poor and non-poor comparisons and also for quintile analyses. To highlight the catastrophic dimensions of treatment expenses, they are now compared with the diminished or the post-illness household incomes (Later in chapter 6 similar comparisons are made with respect to the economic losses suffered by the patients' households). The result of poor and non-poor comparison is shown below:

Table 4.4:   Comparison of treatment expenses and post-illness or the diminished household income

Indicator	Rangpur			Chittagong			All			Non-poor-Poor Ratio
	Poor	Non-poor	Total	Poor	Non-poor	Total	Poor	Non-poor	Total	
Monthly average treatment cost (tk)	296	433	342	488	625	533	393	511	431	1.3
Diminished household monthly income (tk)	689	4544	1547	1543	5152	2426	1080	4769	1951	4.4
% of treatment cost to household monthly income	43	10	22	32	12	22	36	11	22	0.3
Diminished per capita income (tk)	168	846	318	402	931	531	275	875	416	3.2
% of treatment cost to monthly per capita income	176	51	108	121	67	100	143	58	104	0.4

Sharing of the burden of treatment costs:

4.08   Information on the sharing of the cost burden was also collected and analyzed. The results of the poor non-poor comparison and quintile analysis are given below:

4.09   Costs of illness are reported to be borne by the following parties involved:

By self, spouse, near relatives, other relatives.

For poor as well as non-poor patients, major share of the burden was borne by the patients themselves. However, the share of self-burden was significantly higher for the poor patients compared to the non-poor patents.

Table 4.5:   People bearing the expenditure of treatment of the patient by group

Indicator	Poor	Non-poor	Total
Self and spouse	74	56	68
Children	8	17	10
Parents	19	29	22
Siblings	4	4	4
Relatives	4	1	3

In addition to high treatment expenses, TB seems to have inflicted heavy economic losses on the study patients and their households. Economic losses are estimated mainly by the loss of productivity or the working days lost by the patients and other members of their households. The latter lost days while nursing or accompanying the patients in their treatment seeking travels. To estimate the money value of the days lost, information on the average daily wage or earning of the patients and the concerned family members was collected. In case of non-working female patients, who were engaged in household activities, the wage or earning lost by or paid to the substitute persons (i.e. the persons who had to look after her household works) was also collected. The overall economic losses suffered by the patients were then obtained by multiplying the estimated days lost by the average daily earning foregone. The estimated economic losses, therefore, include the productivity losses suffered directly by the patients and the imputed losses of the patients' household members rendering various redress and assistance. The detailed data by the poor non-poor comparison and by the quintile distribution are provided below:

Table 4.6:   Estimated working days lost by the study patients and their household members (Poor non-poor comparison)

Patients group	Total days lost	Patients' days lost	Assistants' days lost
Poor	162	120	42
Non-poor	148	102	46
All	159	115	44
Non-poor-Poor ratio	**0.9**	**0.9**	**1.1**

Estimated economic losses (productivity losses) suffered by the study patients and their households and Economic losses as percentages of the study patients' diminished household incomes

4.10   To bring out the catastrophic dimensions of the economic losses suffered by the study patients on account of TB comparison is made with their diminished household incomes. As mentioned earlier, the diminished incomes were calculated by taking into account the estimated economic losses and the treatment expenses. Results of the poor and non-poor and patient cohort comparisons, which are shown below, highlight the catastrophic losses suffered by the patient households on account of TB.

Table 4.7:   Economic loss as the percentage (%) of diminished per capita income Poor-non-poor comparison)

Patients group	Economic loss (time weighted)			Economic loss as the percentage (%) of diminished household income			Economic loss as the percentage (%) of diminished per capita income		
	Rangpur	Chittagong	Total	Rangpur	Chittagong	Total	Rangpur	Chittagong	Total
Poor	14762	23127	18663	238	167	192	976	639	754
Non-poor	13236	22134	17180	32	48	40	174	264	218
All	14285	22837	18214	103	105	104	499	478	486
Non-poor-Poor ratio	**0.9**	**1.0**	**0.9**	-	-	-	-	-	-

Table 4.8:   Economic loss as percentage (%) of diminished household income Patient Cohort comparison)

Treatment month	Average economic loss (Time weighted)	Household diminished income (Time weighted)	Economic loss as percentage (%) of diminished household income
1	6078	3656	166
2	7193	6937	104
3	7177	8751	82
4	7487	11027	68
5	11123	17734	63
6	11354	19283	59
7	10724	25978	41
8	11024	28817	38
9	11360	28678	40

Total losses (cost of illness and productivity losses) suffered on account of TB

4.11   To assess the dimensions of the total losses the added expenses on account of TB needs to be added to the estimated economic losses and compared with the diminished household incomes of the study patients. This is done in the following tables:

Table 4.9:   Total losses (Poor- non-poor comparison)

Patients group	Total losses	Diminished household income (time weighted)	Diminished per capita income (time weighted)	Total losses as percentage (%) of household income	Total losses as percentage (%) of per capita income
Poor	22206	9720	2475	228	897
Non-poor	21781	42921	7875	51	277
All	22096	17559	3744	126	590
Non-poor-Poor ratio	1	4	3	-	-

Table 4.10:   Total losses (Patient Cohort comparison)

Treatment Month	Total losses	Diminished household income (time weighted)	Diminished per capita income (time weighted)	Total losses as percentage (%) of household income	Total losses as percentage (%) of per capita income
1	7243	3656	731	198	991
2	8848	6937	1387	128	638
3	9562	8751	1750	109	546
4	9948	11027	2205	90	451
5	14335	17734	3547	81	404
6	13782	19283	3857	71	357
7	13878	25978	5196	53	267
8	14414	28817	5763	50	250
9	15254	28678	5736	53	266

4.12   Clearly, the impact of such staggering losses for the households of poor TB patients and, some of the non-poor (who are slightly above the poverty line), is deepening of their poverty status and hastening the pauperization process. This is conceptualized in the following pathway diagram:

```
┌─────────────────────┐      ┌─────────────────┐        ┌──────────────────────────┐
│ Poor TB patients    │      │ Diminished      │        │      Resulting           │
│                     │      │ income          │───────▶│  Pauperization process   │
│                     │      │                 │        │                          │
└─────────────────────┘      └─────────────────┘        └──────────────────────────┘
          │                          ▲
          ▼                          │
┌─────────────────────┐      ┌─────────────────┐
│ Catastrophic treatment│     │ Negative        │
│ expenses and          │────▶│ coping          │
│ Economic losses       │     │ strategies      │
│ suffered              │     │                 │
└─────────────────────┘      └─────────────────┘
```
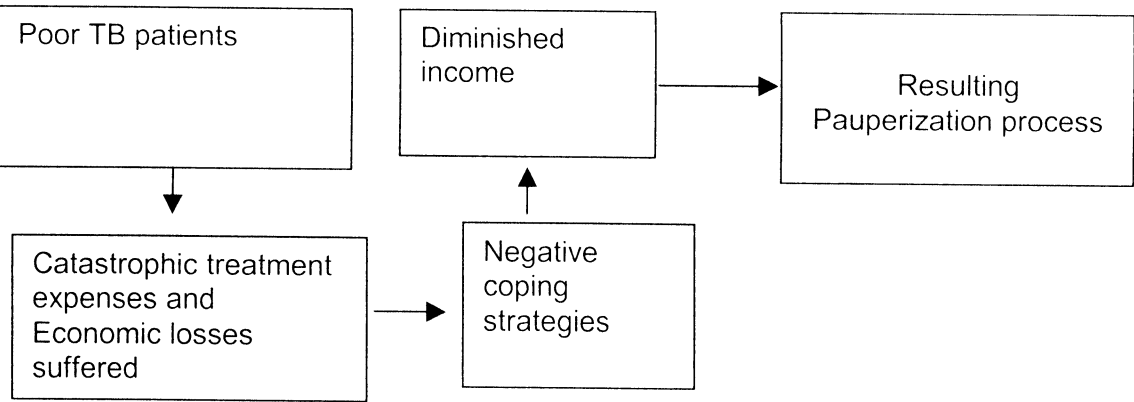
Impact of the cost of illness on poverty status of the study patients:

4.13   Impact of the cost of illness is now analyzed by comparing the distributions of the pre- and post- illness income of the study patients and obtaining the underlying poverty head count ratios of the two distributions with the help of the national poverty line. Such an analysis is known in the health equity literature as Pen's parade, named after the Dutch Economist, Pen. The relevant data and the poverty impact diagrams for the two study areas separately, and for the overall position, are given below:

Table 4.11 Distribution of the pre- and post-illness monthly household income of the study patients:

Household monthly income in Taka	Pre-illness						Post-illness					
	Rangpur		Chittagong		Combined		Rangpur		Chittagong		Combined	
	%	Cum	%	Cum	%	Cum	%	Cum	%	Cum	%	Cum
0-500	7	7	1	1	4	4	29	29	34	34	32	32
500-1000	18	25	3	4	11	15	9	38	9	43	9	41
1000-1500	21	47	9	13	16	31	22	60	11	54	17	58
1500-2000	11	58	8	20	9	40	12	73	8	62	10	68
2000-2500	10	68	6	26	8	48	9	81	5	67	7	75
2500-3000	5	73	22	48	13	61	7	88	10	76	8	83
3000-3500	4	77	6	53	5	66	4	92	4	81	4	87
3500-4000	6	83	10	63	8	74	3	95	2	83	3	89
4000-4500	1	84	8	71	4	78	0	95	6	89	3	92
4500-5000	2	86	8	78	4	82	1	96	1	90	1	94
5000+	14	100	22	100	18	100	4	100	10	100	6	100
Total	100		100		100		100		100		100	

The three Poverty impact diagrams or Pen's Parades - for Rangpur, Chittagong and combined areas are presented below :

Fig. 4.2 : Poverty impact diagram for Rangpur : Comparison of Pre-and Post-illness income distribution of the study patients of Rangpur.

Cumulative % of the patients
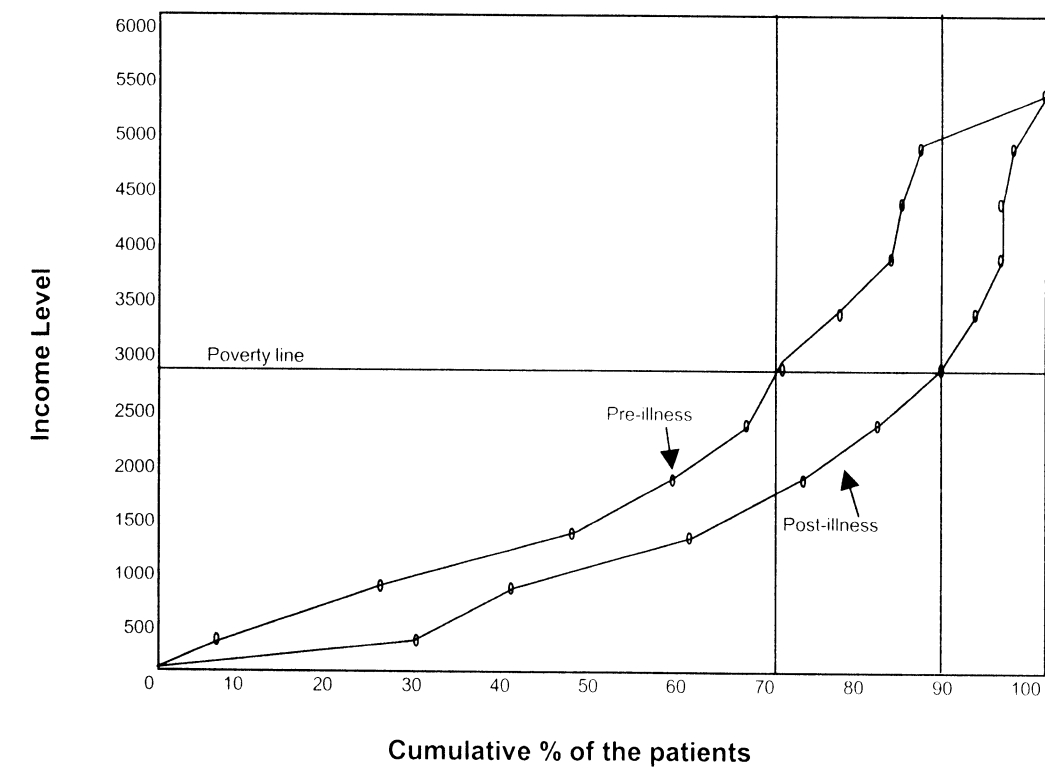
Fig. 4.3 : Poverty impact diagram for Chittagong : Comparison of Pre-and Post-illness income distribution of the study patients of Chittagong.

Cumulative % of the patients
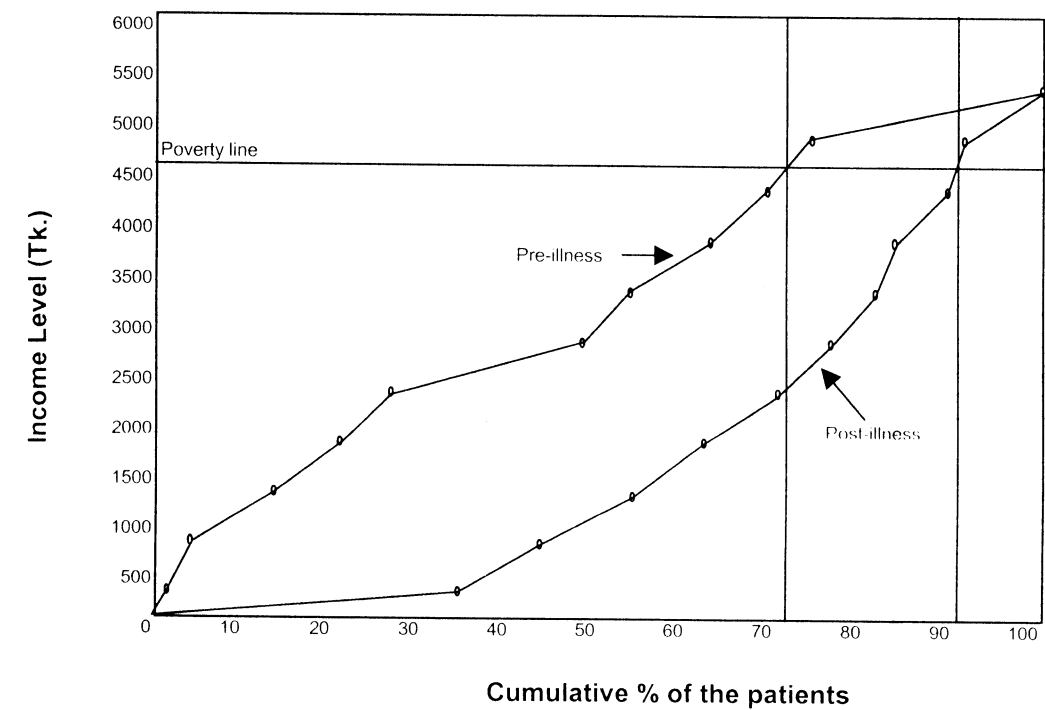
Fig. 4.4 : Poverty impact diagram for Combined : Comparison of Pre-and Post-illness income distribution of the study patients of Combined areas
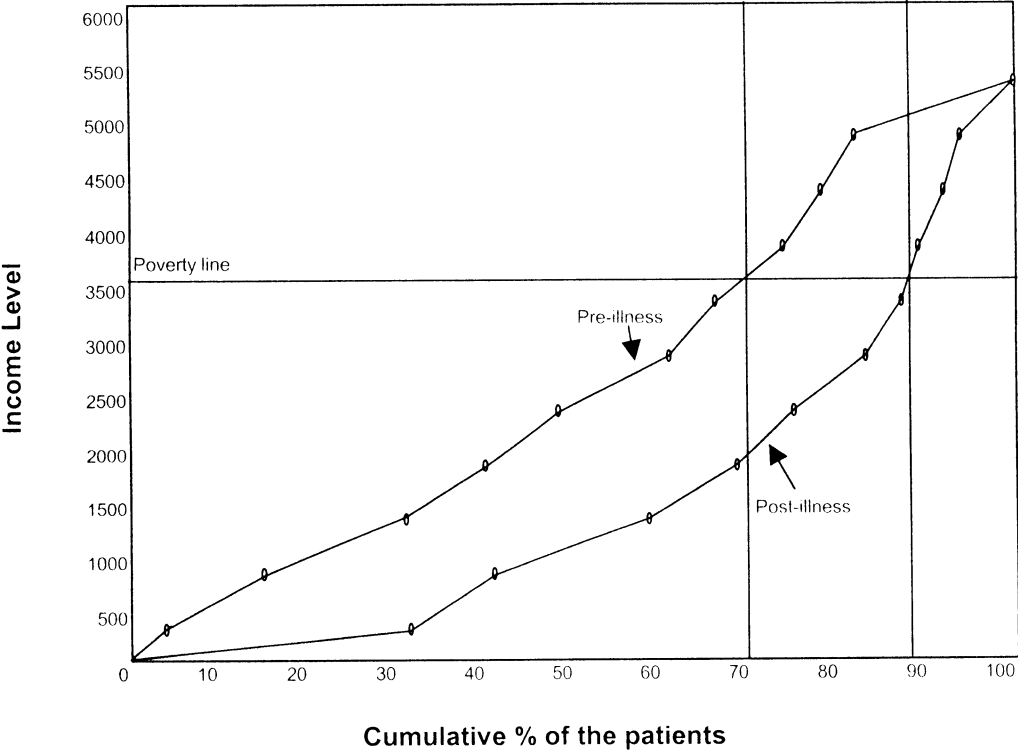
4.14   All the three parades show that post illness incomes of the study patients are lower on the average than the pre-illness incomes and on the whole, as measured by the headcount ratio, poverty among the study patients seem to have increased from the pre illness level of 70 % to 90% in the post-illness period, thus making nearly 20% of the non-poor patients poor. Disaggregated analyses of Rangpur and Chittagong also present similar pictures. Thus the overall economic impact of TB on the study patients seems to have increased their poverty level by around 20% by reducing their productivity and through incurring catastrophic treatment related expenditures.

Chapter 5

Coping Strategy of the Study Patients

Chapter 5

Coping strategy of the study patients

Summary of Chapter Findings

⌐⌐ To overcome the problems arising from their debilitating illness the patients reported to have adopted various coping strategies such as selling assets and produce, borrowing from relatives and friends, reducing expenditures on food and other basic needs and education. Most of these were negative in their impact and hastened the process of pauperization of the already poor patients.

To cope with the economic losses and the heavy burden of treatment (which are mostly in the form of out-of-pocket payments), the study patients and their household appear to have adopted various coping strategies that were investigated as part of the study. The adopted strategies fall into the following broad types:

Typology of the strategies adopted by the study patients to cope with the economic losses suffered

5.02   The wealth and income base of the most of the poor households provided little buffer for maneuvering in the face of catastrophic burden of TB. The households in turn were compelled to adopt strategies for survival that were all negative in impact, and led to reduction of household stock of tangible assets, wealth and income. The general impact of the wealth and income losses on account of adopting the negative survival strategies were catastrophic and appears to pave the way towards further pauperization of the poor households. Tracking of this hypothized pauperization process by monitoring the livelihood of the poor cured TB patients would be useful in throwing further light on the linkages of TB with poverty in Bangladesh.

5.03   The relative importance of the various types of coping strategies among the study patients can be judged from the following poor non-poor comparison and quintile distribution:

Table 5.1: **The pattern of the coping strategies adopted by the study patients (Poor-non-poor comparison)**

Strategies		% of patients		
		Poor	Non-poor	All
Drawing down savings				
	From savings	6	10	8
Reducing/economizing on the basic needs				
	By reducing cost of foods	35	31	33
	By cutting cost of clothes for household members	23	16	19
	By reducing education cost of children	5	0	3
	By stopping education of children	1	1	1
Incurring loans				
	By taking loan	44	22	34
	Advance from employer	1	0	0
Mortgaging				
	By leasing assets	6	0	3
	By selling daily labor in advance	3	1	2
	By selling crops in advance	2	1	1
Selling household assets				
	By selling assets	13	3	8
Receiving transfers and charity				
	Help from relatives and friends	34	32	33
	From donation	1	5	3
	By begging	1	3	2

Note : Total percentage may exceed 100

Fig. 5.1 Non-poor-poor ratio of the copping strategies adopted by the patients
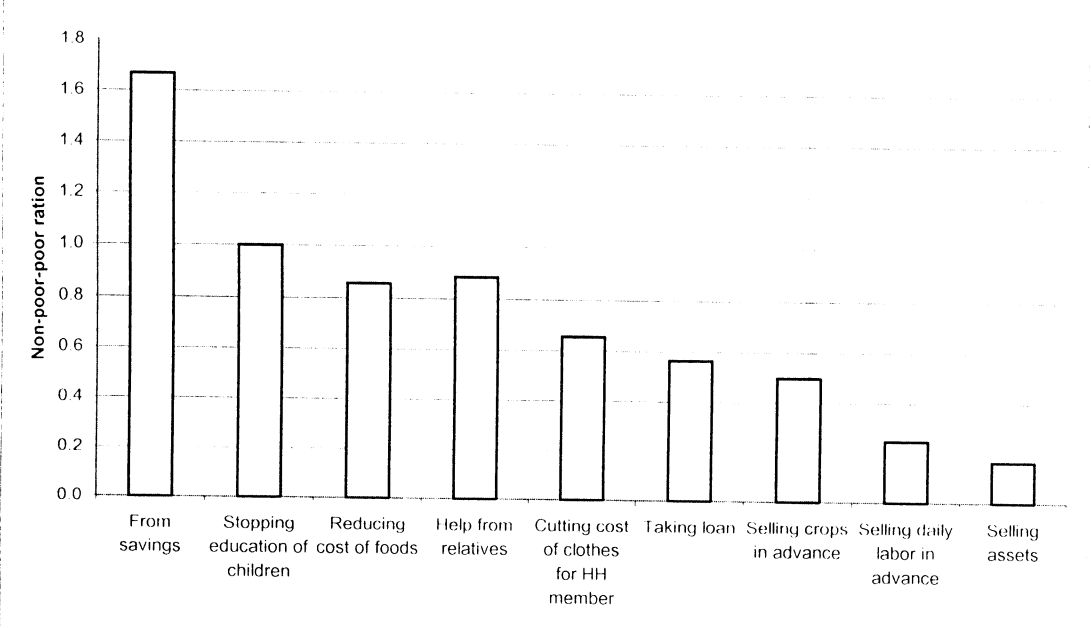
Chapter 6
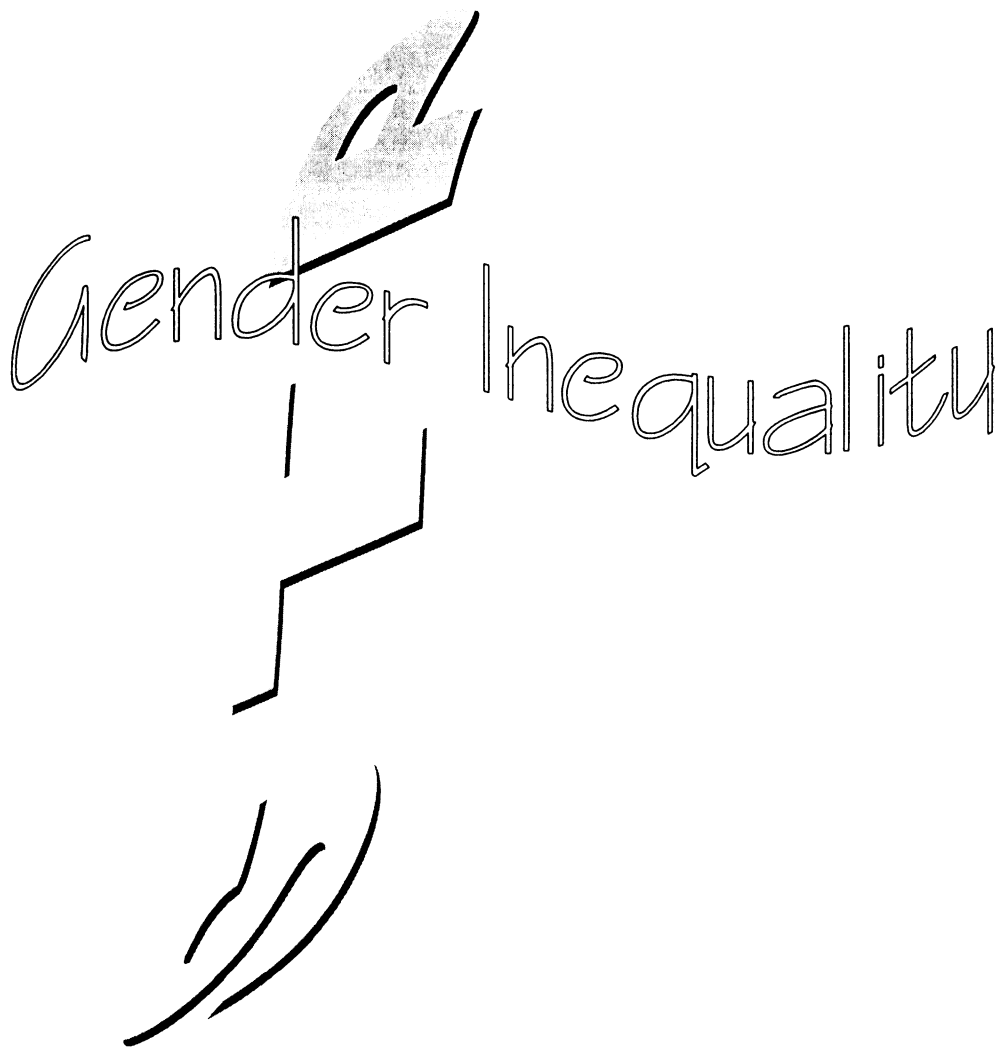
Gender Inequality

Chapter 6

Gender Inequality

Summary of Chapter Findings

- The study found that contacting TB by the females, particularly by the married females, was a major cause of intra-household gender discrimination.

- The female TB patients were found to face double jeopardy. On the one hand, they were regarded as economic burden to their families, illness restricting their ability to work or earn for the family.

- On the other hand, they were looked down upon and somewhat segregated within the family by their husbands and other family members as dangerous source of contagion. This points to the general ignorance about the effectiveness of DOTS treatment, which makes the patient non-contagious within a month of the start of the chemotherapy.

- Many married female TB patients reported neglect and ill treatment from their husbands on account of their disease.

- Outside of home, discrimination by neighbors or at work places was reported to be less acute.

- The female patients did not report any gender discrimination in DOTS service delivery.

The study also investigated whether there was any evidence of open or covert discrimination against the female patients in DOTS services. And also whether they faced discriminatory treatment within their households or at work places outside on account of their disease was also examined.

Evaluation of the evidence of gender inequality

6.02   The sources of information regarding the prevalence of intra-household and work place discrimination were the opinions expressed by the female patients and their attendants at the focus group discussion, opinions of the DOTS service provider as well as the female patients who were interviewed at the study DOTS centers.

6.03   TB appears to be a major cause of intra-household gender discrimination. High incidence of discrimination is reported among the young married poor illiterate women. These women are subjected to torture by husbands and in-laws and to exclusion from family affairs. In the focus group discussion in the urban Chittagong, three out of every four married women participants reported having been tortured by their husbands as well as their in-laws and subjected to eviction from husbands' house. Some of the narratives will corroborate the nature of discrimination and human tragedy (See Box 1).

Box 1:

Farida Begum: Age 25

Farida said, I came here on hearing from people. As I am sick, my husband tortures me, and does not give any farthing for treatment. I do household work in different houses. From there I save money for my treatment. My neighbours do not hate or avoid me; but they suggest that my children should use separate pot for drinking water. I do not find any problem getting medicine from here. Nurses working here behave nice.

Feroza Begum (Garments worker), Age:18

At first I had cough and fever. I took medicines for 5-6 months, but there was no remission. Then doctors said, do X-Ray. I went to Andarkilla then. They gave me TB medicine from there. No money is required for taking medicines from here. Money is, however, needed for doing X-ray.
I stopped taking medicines after three months as I went to my countryside home. But I didn't know these medicines were also supplied free there.
I am a garment worker. My husband is a day labor. During early period of treatment my husband and mother-in-law used to misbehave with me. My husband used to torture me. Now there are a lot of money needed for coming here to take medicine and then going back home. It would be better if there were arrangements here for sending medicines to my house. Doctors have suggested that I should live separately, and take meal separately.

Moni Begum: Age 29

I used to have bleeding during pregnancy, and fever as well. I had developed serious chest pain from severe coughing. Everyone then said, bleeding will stop after delivery. 10 months after delivery I started taking medicines.
I live with my parents as my husband lives separately. My in-laws do not keep in touch with me, so is my husband. My parents bear my treatment costs.

6.04   Two reasons for neglect and avoidance of contact with the TB-afflicted women can be noted. First, she is regarded as an economic burden for the family, and second, she is regarded as a carrier of infection and can cause others to be infected.

6.05   A sick woman is regarded as an economic burden on two counts: first, her cost of illness adds to family expenses, and second, her illness makes her unable to do the daily work making others liable to substitute for her, and the family faces reduced income if she is an earning member.

Box 2:

Asma Akhtar: Age 22

At first I had fever. I spent Taka 3000.00 for medicines. Then doctors said, I had typhoid. I said, how is that I have spent so much money on medicines, but there is no remission of fever. Then the doctor said, I won't give you any further medicines, go to a hospital. Then I came here, and I was sent to Andarkilla from here. I was told from Andarkilla that I had TB.
My neighbours do not avoid me, nor do they say anything bad about me. They do not hesitate to take food together.

Tarika (Student): Age 15

I am a college student. My friends mix up with me normally; because they know that TB is a curable disease now. I know my result will be worse than expected because of illness. I have no feelings of ignominy or inferiority because of TB.

Nusrat Begum (Student; Age: 14)

I had urinary problems, and I became bedridden. Afterwards, I had fever and developed cough. I started taking homeopathic medicines, but to no avail. Then I went to the general hospital. I was diagnosed TB-positive, and proper treatment started then.
I haven't experienced any social problem. Everybody around us is mixing up with me normally and with my family as well.
I had to spend around Taka 1000.00 for x-ray, blood test etc. before I started taking services from government service center. I am getting medicine regularly, and I have to pay nothing for this.
My residence is about 2 kilometers from the Urban Dispensary, and I need to spend Taka 30.00 for coming here. This extra expenditure is telling upon the financial condition of my family, which is suffering a lot for this.
My health is deteriorating due to want of good food. My family cannot afford to buy good food for me. We will benefit if government extends financial help to patients. I am hopeful that I will get cured through treatment.

6.06   At the community level discrimination is not reported. Poor female patients are allowed unhindered access to work places including household work, and families where they work are not reported to show any animosity or avoidance. Rather they offer suggestions that would keep others less at risk (See Box: 1 & 2).

6.07   As mentioned earlier no gender discrimination was noted among the service providers while providing DOTS services to the female study patients. The study did not find any evidence of open (deliberate) or concealed (covert) gender discrimination to the detriment of the female patients. Gender dis-aggregation of selected indicators such as waiting time, non-receipt of the required dosage from DOTS and payment of underhand money to get DOTS services, which could reveal the presence of covert gender discrimination, do not indicate any significant discriminatory treatment. The study reveals equal waiting time for both male and female TB patients both at Chittagong and Rangpur; non-supply of medicine represents a slight negative bias to female patients. However, those are not significant.

6.08   The waiting time for the female patients was the same as for the male patients in both the study areas.

Table 6.1   Average waiting time (in minutes) per trip per patients at DOTS service centers

Sex	Av. waiting time per trip (minute)		
	Rangpur	Chittagong	Total
Male	17	14	16
Female	18	15	16
All	18	15	16
Male-female ratio	1	1	1

Table 6.2   Male-Female comparison of the status of the supply of medicine from DOTS

Group	Sex	% of patients not supplied medicine from center
Poor	Male	8.8
	Female	9.0
	Total	8.9
	Male-Female ratio	1.0
Non-Poor	Male	10.1
	Female	7.9
	Total	7.8
	Male-Female ratio	1.3
Total	Male	9.3
	Female	7.3
	Total	8.6
	Male-Female ratio	1.3

Cost of illness of females compared to male study patients

6.09   Following ToR, treatment expenses of the female patients borne by the households were compared with the treatment expenses of the male patients to detect whether the household discriminated between male and female patients in meeting their treatment expenses.

6.10   Gender comparison of cost of illness was done at two levels: by patient cohort comparison and poor non-poor comparisons. The first comparison was done to test whether there was any differential by treatment time. The costs of illness were almost equal for both females and males for all treatment cohorts. This is revealed in the following table:

Table6.3:   Cost of illness of females compared to male study patients

Patients group	Gender	Average treatment cost (time weighted)
Poor	Male	3129
	Female	4286
	Total	3540
	Male-Female ratio	**0.7**
Non-poor	Male	4437
	Female	4995
	Total	4600
	Male-Female ratio	**0.9**
All	Male	3537
	Female	4541
	Total	3880
	Male-Female ratio	**0.8**

Fig6.1: Cost of illness of female patients compared to male patients (time weighted)
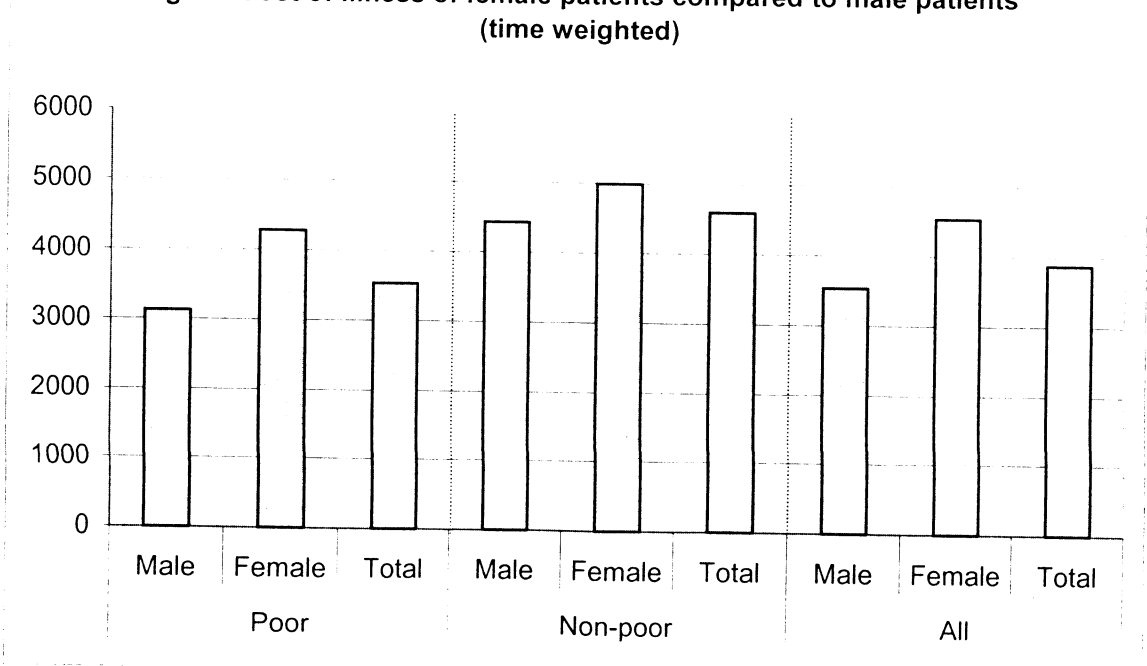
Cost of illness of patient cohorts disaggregated by gender

6.11   Poor non-poor comparison also did not reveal any significant difference in the treatment expenses of poor female and poor male study patients. The differences in the case of non-poor were also not significant. The t-tests also confirmed that the average female and male treatment expenses between the patient cohort and the poor non-poor groups are not significantly different.

Table 6.4:   Cost of illness of patient cohorts disaggregated by gender

Treatment month	Male	Female	Total	Male-female ratio
1	920	1485	1165	0.6
2	1633	1699	1656	1.0
3	2451	2284	2385	1.1
4	2709	2041	2460	1.3
5	3130	3474	3211	0.9
6	2661	2194	2428	1.2
7	3271	3004	3154	1.1
8	3272	3662	3390	0.9
9	3300	6069	3894	0.5
9th-1st ratio	4	4	3	

Fig. 6.2 Cost of illness of patients cohort disaggregated by gender
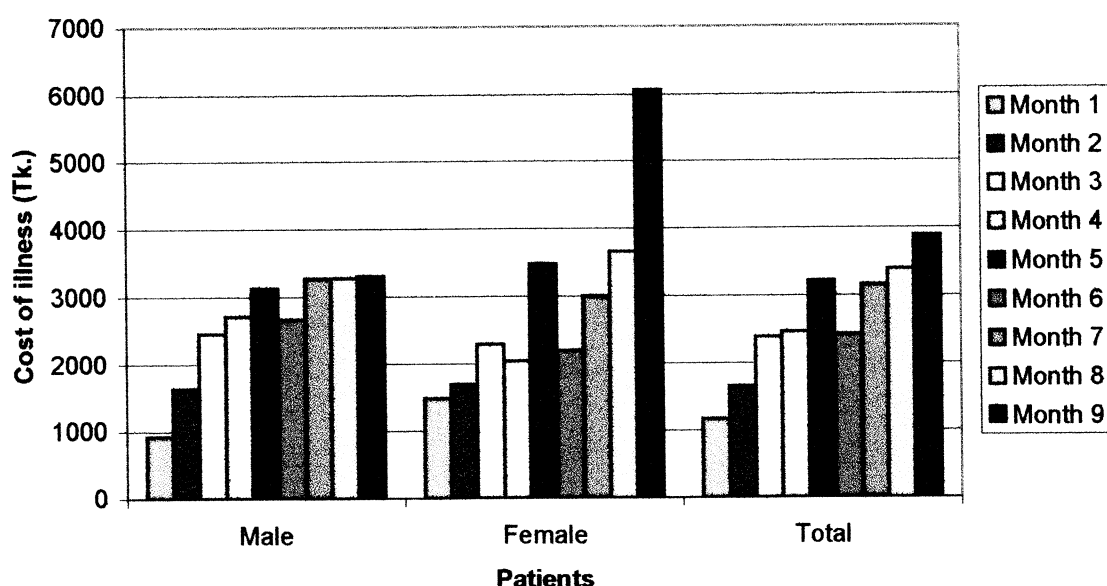
Chapter 7

Conclusions and Discussions

Chapter 7

Conclusions and Discussion

There were some limitations on part of the study. The study is based on a relatively small sample of TB outpatients and the findings are, therefore, likely to suffer from usual statistical variations associated with small sample. Due to resource and time constraint data on the daily calorie intake of the study patients could not be collected. This would have involved conducting full-fledged food intake survey of the patients' household and collecting data on the food quantities consumed daily by the study patients and calculating the intakes of calories and the essential nutrients. In absence of direct data the daily calorie intake was indirectly estimated.

7.02   The second weakness was omission in the ToR of holding a focus group discussion with the poor patients of Rangpur study area similar to the focus group discussion in Chittagong. As a result, an opportunity to assess the views of rural TB patients on key issues such as gender inequality or the quality of rural DOTS provision was missed.

7.03   In spite of these apparent weaknesses, the study appears to be a robust one and was successful in investigating in-depth the links of TB with poverty. The entire focus of the study was on poverty of the study patients and how poverty linkages affected the behavioral responses of the study patients to DOTS treatment regimen. The study explored some aspects of the nexus between TB and poverty in Bangladesh by broadly mapping the economic impact of TB by studying in-depth a small sample of TB outpatients who were seeking the state-of-the-art DOTS treatment in one rural and one urban study area.

7.04   A novel feature of the study was separation of the study patients into poor and non-poor groups with the help of poverty lines that were study area specific. Instead of using a single national poverty line, which is too aggregated, disaggregated area specific poverty lines were used which gave a more realistic grouping of the study patients into poor and non-poor categories, and all the study parameters were analyzed through poor and non-poor comparison which helped to reveal clearly the linkages of TB with poverty among the study patients. The distributional aspects of the parameters were also analyzed by quintile analysis, which supplement all poor non-poor comparisons and brought out the distributional inequalities observed in income, asset ownership, economic losses and coping strategies of the study patients.

7.05   Majority of the study patients-both male and female- were found to be poor and seemed to incur catastrophic loss of income and productivity and heavy treatment costs on account of their TB infection in spite of apparently receiving free or fully subsidized treatments under DOTS.

7.06   To cope with catastrophic loss of income and incur rather large and demanding out of pocket expenses for treatment, the poor were forced, in absence of hardly any family savings, to make choices with regard to various survival or coping strategies such as reducing food intake; cut down basic needs expenditures such as clothing and education; mortgage household assets such as land or produce or even labor of self or other members of family. The impact of all these strategic choices on the patients' household income, asset holding or level of living was obviously negative.

7.07   The absence of social safety nets especially in the form of health insurance on which the poor TB patients could fall back upon to meet heavy treatment expenses and recoup some of the "catastrophic" economic losses suffered as a consequence of the disease is tragic. The economic burden of TB in the form of the loss of income and productivity of the families of the poor patients can be reduced by providing credit for income generating activities. It is therefore essential that during the treatment period, and after cure, the poor patients and their families have access to income generating credit programs operated at the grass root levels.

7.08   The other recommendation of the study would be to explore the feasibility of putting in place an effective social safety net in the form of health insurance with a feasible mechanism for prepayment of the insurance premium to lower the burden of the poor beneficiary. The objective would be to help the poor patient when their needs are the greatest. However, the twin risks of moral hazard and adverse selection would be likely to thwart any public sector initiative in this respect. A feasible approach would be to launch a selected community targeted pilot project of health insurance experiment, say, of group insurance with group liability in the line of Grameen credit schemes. An experienced health NGO working at grass root level can be inducted for the experiment, learned from the initiative and in case of success, replicate the program gradually with the assistance of WHO and selected donors. Currently, Gonoshastho Kendra (GK) of Savar, Dhaka seems to be active in community health insurance program and its experience may provide guidance in this respect.

7.09   The other area where NGOs can act as screening of adults with priority to poorer families that would supplement the current child immunization drive. Immunization and screening program needs to be supported by intensive media and grass root level publicity through health NGOs regarding symptoms of TB infection and state-of-the–art cure available through DOTS centers. The study found that majority of the study patients particularly the rural patients were ignorant about the availability of DOTS cure and wasted valuable time and resources in searching for a cure and eventually getting on the DOTS treatment. Only a small fraction of the rural patients came directly to DOTS centers. The proportion was much higher in the urban area studied. Given the current state of medical technology even in Bangladesh, the message that TB is fully curable through the state-of-the-art, cure developed especially for countries like Bangladesh deserves to be widely propagated specially in rural areas.

7.10   The study also found that the DOTS supply logistics is particularly deficient in rural areas so that a sizeable proportion (sizeable from the point of view of risk of relapse due to interruption of medicine intake) of outpatients on on-going treatment regimen were frequently deprived of their regular supply of medicine, which they could not afford to buy from the market. In fact, DOTS program should be regularly monitored for detecting lapses in supply and services and remedial action taken promptly through GO and health NGO collaboration.

7.11   The study found the distribution of DOTS subsidies or the public expenditure for the DOTS treatment to be pro-poor i.e. utilized more by the poor patients than the non-poor ones, and DOTS treatment care was observed to be providing beneficial social transfers to the poor TB patients. The study also did not find any evidence of gender discrimination in providing DOTS treatment care to the TB patients.

7.12   A deeper analysis would show that as a consequence of the "catastrophic' loss of income and heavy treatment costs, the poor patients are likely to become poorer and some non-poor patients move below the poverty line. This may be regarded as the pauperizing effect of TB.

7.13   The economic and social consequences of TB are, therefore, likely to show up at micro levels in the form of increases both in the head count ratio; or the poverty spread and the poverty gap or poverty depth.

7.14   To explore the economic and social consequence of TB, particularly in rural Bangladesh, a wider and in-depth community survey should be launched through which extensive epidemiological, demographic and social information and data could be collected to assess the current number and distribution of TB infected individuals in the population more accurately and to make realistic projections about the likely epidemiological dynamics of TB in the country.

7.15   By way of summarizing, the study develops a framework for depicting both the backward and forward linkages of TB with poverty. The framework is presented below:

Findings of the Study:

1. As for the utilization of DOTS services by the poor, the study found that a significant majority (70%) of the study patients belong to the poor segments of the population and had income below the area specific poverty lines (of Taka 582 per person per month or Taka 19 per day per person in rural Rangpur and Taka 971 per month or Taka 32 per day per person in urban Chittagong area). In fact, 61% were found to be absolutely poor and had an average income lower than national poverty line of Tk. 582 a month. At the same time, a good proportion of the rural TB patients (45%) were found to be agricultural day laborers/day laborer and marginal farmers, while the 20% of the urban patients service holders, craftsmen (6%), and rickshaw pullers (5%). Again, most of the poor patients were residing in thatched houses with very little sanitary facilities or electricity but had access to tube-well water for drinking purposes. Majority of the study patients across the rural and urban areas were found to be illiterate and without any formal education. The asset ownership pattern also showed relatively much less possession by the poorer segment of the patients.

2. Although DOTS treatment (services and medicine) was largely provided free, except for travel costs and expenses of the accompanying persons, most of the study patients were found to be incurring large expenses for treatment due to the expenses incurred before being registered with DOTS and also on account of expensive but DOTS non reimbursable cost of procedures. Some patients were also found to be purchasing the required medicine due to non-availability of supply. Adding travel expenses, expenses on account of the diets of the patients and expenses of the accompanying persons, the cost of illness increased significantly and was found to be generally of catastrophic dimension when compared to the patients' declining incomes resulting from the on-set of the disease. On the average, treatment cost was found to be slightly higher than the patients' monthly income, but almost 50% higher in case of the poor patients. The patients themselves or their spouses were found to bear the major share of the treatment expense.

3. The economic losses or the productivity or income losses suffered by the patients on account of their TB infection are significant. Economic losses were estimated by valuing the workdays lost by the study patients by their estimated average daily earning or wage. In case of non-working female patients, estimated expenses on account of substitute work helps were used. The estimated economic losses were found to vary from seven and half times the per capita income in case of the poor patients, and more than twice the per capita income in case of the non-poor patients. The economic losses suffered by the TB patients were thus found to be of catastrophic dimensions. The hardship of the patients, particularly the poor patients, were compounded in absence of social safety nets and majority of the patients (72%) were found to adopt coping strategies the impact of which on their livelihood or asset holding were largely negative.

4. The general pattern of coping strategies adopted by the poor and non-poor patients in the face of catastrophic losses of productivity and income suffered on account of TB is stated to be manifold. In the face of meager or non-existent family savings, 34% of the study patients took loan, 33% took loan from relatives/friends, 33% reduced or cut down the cost of food, 19% cut down expenditure on clothes, 8% sold assets and another 8% spent from earlier savings.

5. In respect to gender inequality with DOTS treatment, accessibility and intra-household expenditure pattern, the study did not find any inequality in DOTS treatment or accessing DOTS treatment regime by the female patients. However, the focus group discussion brought out the existence of intra-household inequality in the treatment received by the female patients on account of their illness, particularly from the their spouse or other family members. In outside workplaces, on the other hand, they did not face any discrimination or adverse treatment on account of their illness; rather they were meted out with friendlier treatment or advice.

Recommendations:

In light of the above findings, the following recommendations are made:

1. Although the study revealed that, the DOTS TB services are being utilized by relatively poorer segments of the population both in the urban and rural sectors, it was also found that only a little more than a quarter (27%) of the study patients registered directly with DOTS. It was found that many sought remedies initially from the private and indigenous medical practitioners. It is only after wasting a lot of time, and even money, they registered themselves with DOTS.

   This is indicative of lack of adequate awareness and information flow among the people. As such, a comprehensive awareness building and motivation program is needed to inform the people in general, and potential as well as actual TB patients in particular, about the services being provided under the DOTS TB program.

   In addition to the motivation and information campaigns, skill development training related to identification and referral of TB cases for the Health Workers

may be strengthened so that the workers can identify the potential TB cases at the first instance and make necessary referrals for bringing the patients under the DOTS program. Even the private Village Doctors who were reportedly consulted by 73% of the study patients in connection with their TB treatment may also be brought under the purview of such skill development training.

2. The DOTS program envisages providing free services and medicines to the patients. However, it was found that in some instances, the supply of medicines could not be ensured on time. The reasons stated as: there was no medicine in the center, absence of the dispensing person, demand of underhand money from the clients and hartal. In view of this, it is recommended that the medicine stock at the service centers should be ensured. It is also recommended that the staff be motivated not to exploit the patients.

3. It has been reported that the patients had to arrange for the pathological and other tests at their own cost, which is very exorbitant and repressive for the poor people. Options should be explored as to how such a cost can be avoided or even subsidized.

4. Efforts are to be taken to minimize the number of defaulters/drop-outs. One way of improving the situation particularly in the rural areas is to strengthen the follow-up and monitoring activities by the respective Health Workers who will have the responsibility to ensure continuous treatment of the patients. The counseling services by the staff need to be strengthened so as to enable the patients to take informed decisions in respect to the periodic status of their treatment vis-à-vis their ailment.

5. As revealed in the focus group discussions with the female patients, there were instances of discrimination with women patients at their own *household level*, where they had been physically assaulted and even driven out from their husbands' house as they were having TB. As such, it is strongly recommended that a holistic approach be adopted to educate all the household members not to discriminate with the female patients. Even the community leaders such as UP Chairperson and members and other elite persons should be associated with such motivation campaigns.

6. Effective income-generating options should be explored to form social safety nets for the TB infected patients in order to make up their household income and asset loss and to arrest the process of pauperization.

Appendix

Tables

Chapter: 2, 3, 4

Chapter-2

Table-1 : Demographic characteristics of the poor and non-poor patients

Demographic Indicator	Rangpur				Chittagong				All			
	Poor	Non-poor	Total	Non-Poor - Poor Ratio	Poor	Non-poor	Total	Non-Poor - Poor Ratio	Poor	Non-poor	Total	Non-Poor - Poor Ratio
Average age	38	39	38	1.0	29	31	30	1.1	34	36	34	1.1
Average age of the male patients	40	45	41	1.1	33	33	33	1.0	37	40	38	1.1
Average age of the female patients	33	27	31	0.8	26	28	26	1.1	28	28	28	1.0
% females	27	30	28	1.1	50	37	46	0.7	38	33	36	0.9
% married	80	75	79	0.9	59	46	55	0.8	70	62	68	0.9
Average household size	5	6	5	1.3	5	6	5	1.3	5	6	5	1.3
% of patients who were the head of the households	59	51	57	0.9	36	26	33	0.7	48	40	46	0.8
% of female patients who were the wives of head of the households	21	18	20	0.8	27	17	24	0.6	24	17	22	0.7
Average no. of dependents per household	2	1	2	0.7	2	2	2	0.9	2	1	2	0.8

Table-2 : Average per capita monthly income of male and female patients by quintile

Quintile	Rangpur			Chittagong			All		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
1st	183	229	194	175	159	162	183	211	191
2nd	319	356	330	338	433	371	325	385	344
3rd	549	579	553	649	661	654	595	646	611
4th	664	721	678	814	769	792	744	759	750
5th	1377	1224	1315	1170	1366	1242	1251	1305	1272
Total	529	629	556	822	828	825	647	745	681
Rich-Poor Ratio	8	5	7	7	9	8	7	6	7

Table-3: Average age, percent of female, percent of married, average household size, percent of HH headed and percent of wife of HH among the TB patient by Quintile

Overall

Quintile	Average age (yr)			Percentage of female	Percentage married	Av. Household size	Percentage head of the household	Percentage wife of HH
	Male	Female	All					
1st	42	33	39	34	71	4.3	66	16
2nd	39	29	35	35	82	4.8	49	32
3rd	36	25	32	34	69	4.4	44	21
4th	37	27	33	41	63	5.3	43	24
5th	38	27	34	37	52	6.3	27	16
Total	38	28	34	36	68	5.0	46	22
Rich-Poor Ratio	**0.9**	**0.8**	**0.9**	**1.1**	**0.7**	**1.5**	**0.4**	**1.0**

Rangpur

Quintile	Average age (yr)			Percentage of female	Percentage married	Av. Household size	Percentage head of the household	Percentage wife of HH
	Male	Female	All					
1st	42	35	40	29	77	4.3	68	18
2nd	40	31	37	33	88	5.0	49	33
3rd	37	21	34	14	75	4.5	61	7
4th	45	33	41	26	78	5.7	57	22
5th	46	25	39	35	69	6.6	38	15
Total	41	31	38	28	79	5.0	57	20
Rich-Poor Ratio	**1.1**	**0.7**	**1.0**	**1.2**	**0.9**	**1.5**	**0.6**	**0.9**

Chittagong

Quintile	Average age (yr)			Percentage of female	Percentage married	Av. Household size	Percentage head of the household	Percentage wife of HH
	Male	Female	All					
1st	12	25	23	83	0	4.3	50	0
2nd	36	26	32	40	72	4.5	48	32
3rd	35	25	30	48	65	4.3	33	30
4th	31	25	28	49	56	5.1	36	24
5th	33	29	31	39	41	6.1	20	17
Total	33	26	30	46	55	5.0	33	24
Rich-Poor Ratio	**2.7**	**1.1**	**1.3**	**0.5**	**-**	**1.4**	**0.4**	**-**

Table-4 : Housing condition and ownership of dwelling house by location byquantile

District	Quantile	Housing condition (%)				Sanitation (%)		Access (%)		Consumer durables (%)	
		Kutcha	Semi-pucca	Pucca	Slum like	Adequate	Inadequte/open space	Safe water	Electricity	Radio	Television
Rangpur	1st	88	0	0	12	10	90	100	8	3	0
	2nd	96	2	0	1	33	67	100	11	9	2
	3rd	92	4	0	4	32	68	100	28	14	6
	4th	87	9	4	0	52	48	100	25	22	25
	5th	75	12	12	1	65	35	96	63	63	46
	Total	90	4	2	4	32	68	99	25	21	14
	Rich-Poor Ratio	1	-	-	0.1	7	0.4	1	8	20	-
Chittagong	1st	82	17	0	1	67	33	100	72	41	11
	2nd	56	12	20	12	72	28	100	88	50	38
	3rd	59	10	15	16	75	25	100	74	42	5
	4th	59	22	13	6	91	9	96	88	21	23
	5th	34	27	32	7	98	2	100	95	32	43
	Total	54	18	19	9	85	15	99	88	31	29
	Rich-Poor Ratio	0.4	2	-	5	1	0.1	1	1	1	4
Overall	1st	85	1	0	13	15	85	100	9	5	2
	2nd	74	6	7	13	47	53	99	21	14	6
	3rd	63	7	9	21	57	43	94	44	24	5
	4th	66	18	10	6	78	22	90	61	21	24
	5th	46	21	24	9	85	15	96	76	49	45
	Total	67	11	10	12	56	44	96	45	24	19
	Rich-Poor Ratio	1	14	-	1	6	0	1	8	11	29

Table-5: Average per capita monthly income of male and female patients by quantile

Quintile	Rangpur			Chittagong			All		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
1st	183	229	194	175	159	162	183	211	191
2nd	319	356	330	338	433	371	325	385	344
3rd	549	579	553	649	661	654	595	646	611
4th	664	721	678	814	769	792	744	759	750
5th	1377	1224	1315	1170	1366	1242	1251	1305	1272
Total	529	629	556	822	828	825	647	745	681
Rich-Poor Ratio	8	5	7	7	9	8	7	6	7

Chapter – 3

Table-1 : Improvement rates compared to rates of non-improvement and deterioration of the study patients

District	Group	Sex	% of patients reporting improvement				% of patients reporting no change	% of patients reporting deterioration
			Fast	Well	Slowly	Total		
Rangpur	Poor	Male	5	38	43	87	12	1
		Female	0	56	26	82	18	0
		Total	4	43	38	86	14	1
	Non-poor	Male	0	55	35	90	10	0
		Female	6	65	29	100	0	0
		Total	2	58	33	93	7	0
	Total	Male	4	44	40	88	11	1
		Female	2	59	27	88	12	0
		Total	3	48	37	88	12	1
Chittagong	Poor	Male	2	38	46	86	13	2
		Female	2	47	36	85	13	2
		Total	2	42	41	86	13	2
	Non-poor	Male	7	45	38	90	10	0
		Female	0	41	35	76	24	0
		Total	4	43	37	85	15	0
	Total	Male	4	40	44	87	12	1
		Female	1	46	36	83	15	1
		Total	3	43	40	85	13	1
All	Poor	Male	4	38	44	86	12	1
		Female	1	51	33	84	15	1
		Total	3	43	40	86	13	1
	Non-poor	Male	3	51	36	90	10	0
		Female	3	53	32	88	12	0
		Total	3	51	35	89	11	0
	Total	Male	4	42	42	88	12	1
		Female	2	51	33	85	14	1
		Total	3	45	38	87	12	1
Non-poor-Poor Ratio	**All**	**Male**	1	1	1	1	1	0
		Female	3	1	1	1	1	0
		Total	1	1	1	1	1	0

Table-2: Quality of DOTS service : Poor non-poor comparison of the status of the supply of medicine from DOTS

Dstrict	Group	Sex	% of patients not supplied medicine from center	% of patients buying medicine from the market	% missing (residual)
Rangpur	Poor	Male	11.0	5.5	5.5
		Female	11.8	8.8	2.9
		Total	11.2	6.4	4.8
	Non-Poor	Male	10.0	2.5	7.5
		Female	11.8	5.9	5.9
		Total	8.8	5.3	3.5
	Total	Male	10.7	4.6	6.1
		Female	9.8	9.8	0.0
		Total	10.4	6.0	4.4
Chittagong	Poor	Male	5.4	5.4	0.0
		Female	7.3	7.3	0.0
		Total	6.3	6.3	0.0
	Non-Poor	Male	10.3	10.3	0.0
		Female	0.0	0.0	0.0
		Total	6.5	6.5	0.0
	Total	Male	7.1	7.1	0.0
		Female	5.6	5.6	0.0
		Total	6.4	6.4	0.0
All	Poor	Male	8.8	5.4	3.4
		Female	9.0	7.9	1.1
		Total	8.9	6.4	2.5
	Non-Poor	Male	10.1	5.8	4.3
		Female	7.9	5.9	2.0
		Total	7.8	5.8	1.9
	Total	Male	9.3	5.6	3.7
		Female	7.3	7.3	0.0
		Total	8.6	6.2	2.4
Non-Poor-Poor Ratio	**All**	**Male**	**1.1**	**1.1**	**1.3**
		Female	**0.9**	**0.7**	**1.8**
		Total	**0.9**	**0.9**	**0.8**

Chapter-4

Table-1 : Average treatment cost of the patient corresponding to the duration of treatment received by district poverty line by sex

Treatment month	Sex	Rangpur	Chittagong	Total
1	Male	994	898	920
	Female	1020	1624	1485
	Total	**1005**	**1214**	**1165**
2	Male	1846	1430	1633
	Female	1614	1748	1699
	Total	**1782**	**1554**	**1656**
3	Male	2491	2375	2451
	Female	2694	1533	2284
	Total	**2571**	**2038**	**2385**
4	Male	2744	2659	2709
	Female	2105	1983	2041
	Total	**2538**	**2365**	**2460**
5	Male	3117	3151	3130
	Female	2408	4007	3474
	Total	**3016**	**3453**	**3211**
6	Male	2990	1871	2661
	Female	1553	2544	2194
	Total	**2511**	**2334**	**2428**
7	Male	3308	3137	3271
	Female	3298	2759	3004
	Total	**3305**	**2885**	**3154**
8	Male	3408	2886	3272
	Female	2984	3952	3662
	Total	**3345**	**3460**	**3390**
9	Male	3430	2000	3300
	Female	10600	3803	6069
	Total	**4082**	**3202**	**3894**

Table-2 : Economic loss as the percentage of diminished household income of patients

Duration of treatment received (month)	Group	Monthly household declined income	Household diminished income (Time weighted)	Average economic loss (Time weighted)	Economic loss as percentage (%) of diminished household income
1	Poor	2694	2694	5460	203
	Non-poor	6300	6300	7439	118
	Total	3656	3656	6078	166
2	Poor	2190	4380	7359	168
	Non-poor	6147	12293	6782	55
	Total	3468	6937	7193	104
3	Poor	1724	5173	7061	136
	Non-poor	6386	19159	7576	40
	Total	2917	8751	7177	82
4	Poor	1973	7891	7385	94
	Non-poor	5048	20194	7834	39
	Total	2757	11027	7487	68
5	Poor	2023	10117	10263	101
	Non-poor	7286	36432	13597	37
	Total	3547	17734	11123	63
6	Poor	2043	12257	11586	95
	Non-poor	6467	38800	10659	27
	Total	3214	19283	11354	59
7	Poor	1608	11257	11931	106
	Non-poor	7450	52150	8137	16
	Total	3711	25978	10724	41
8	Poor	2159	17269	10803	63
	Non-poor	6128	49027	11763	24
	Total	3602	28817	11024	38
9	Poor	1542	13880	9703	70
	Non-poor	6146	55314	14260	26
	Total	3186	28678	11360	40

References

1. BBS December 2001: Preliminary Report of Household Income and Expenditure Survey –2000

2. Binayak Sen: Health and poverty in the context of country development strategy: a case study on Bangladesh, Geneva WHO 1997, Macroeconomics and Health Development Series No.26

3. Desmet, M, A.Q. Chowdhury, Md. K Islam: The potential for social mobilization in Bangladesh: the organization and functioning of two health insurance schemes Special issue of social Science & Medicine on Health insurance.

4. Desmet M, I. Bashir and N. Sohel: Direct and indirect health care user expenditure but slum residents in Dhaka city, Bangladesh: Health Economics Program, ICDDRB Working Paper Series, No.2/C, (1998, ICDDRB, Dhaka.

5. Hoque,M.A. and Pierpaolo de Colombani: Achievements of the National TB Control Programme: Bangladesh Medical Research Council Bulletin, Vol. 25, No.3 December 1999

6. Hoque, S: The national Tuberculosis Control Programme: Bangladesh Medical research Council Bulletin, Vol. 25, No.3 December 1999

7. Pryer J. (1993): The impact of adult ill health on household income and nutrition in Khulna, Bangladesh: Environment and Urbanization 5(2): 35-49.

8. WORLD TB Day Supplement: Daily Star, 24 March 2002