TREATMENT INITIATION AND COMPLIANCE AMONG TUBERCULOSIS PATIENTS IN ADDIS ABABA

A THESIS PRESENTED
TO THE SCHOOL OF GRADUATE STUDIES OF
ADDIS ABABA UNIVERSITY

IN PARTIAL FULFILMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
MASTER OF PUBLIC HEALTH

BY

MICHAEL TADDESSE, MD
DECEMBER, 1997

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

Treatment initiation and Compliance among TB patients in Addis Ababa

By

Michael Tadesse, MD

Department of Community Health
Faculty of Medicine, Addis Ababa University

Approved by the Examining Board

Dr. Derege Kebede _____
Chairman, Department Graduate Committee

Dr. Yemane Berhane _____
Advisor

Prof. Aly Massoud _____
Examiner

Dr. Derege Kebede _____
Examiner

ACKNOWLEDGEMENTS

I am very grateful to the department of community health for providing the necessary technical and logistic support and making this study possible.

My thanks are also extended to Dr Yemane Berhane, my primary advisor, who was very enthusiastic on the research work, for his heartful assistance since the inception to completion of the study. I am also very grateful for his advice which influenced me to work hard. The contribution made by Dr Fisseha Eshetu is also very much appreciated.

I am grateful to the health workers in all tuberculosis follow up clinics who were helpful in the data collection process.

I would also like to thank Dr Ayele Belachew head of region 14 TB and Leprosy Control programme.

Special thanks and appreciation also goes to all tuberculosis patients who participated in this study without whom it was impossible to prepare this thesis.

I am also thankful to MPH graduate students for their constant support and academic discussion on my thesis topic.

Last but not least, I am indebted to Dr Zahara Mohammed who at the highest time of my research work shared my family responsibility.

Dedication

This thesis is dedicated to my wife Dr. Zahara Mohammed and to our childern Eliase and Dina.

Table of contents

LIST OF TABLES

List of figures

List of abbreviations

DOTS -	Directly observed short course treatment
AIDS -	Acquired Immunodeficiency Syndrome
HIV -	Human Immunodeficiency Virus
IUATID -	International Union Against Tubercle Lung Disease
PAS -	Para-aminosalicylic acid
TB -	Tuberculosis
MOH -	Ministry of Health

Abstract

A hospital based descriptive and longitudinal study with internal comparison was carried out to describe the treatment initiation pattern and compliance rate among tuberculosis patients. All government health center providing tuberculosis treatment were part of the study, patients were interviewed by nurses in health center. The study was carried out in Addis Ababa between May 9 1997 to September 25 1997. A total of 765 newly diagnosed tuberculosis patients were enrolled in the study.

The median time from the onset of the illness until the initial medical consultation was 2 months (patient's delay). This delay was longer in uneducated patients.

Fifty percent of patients were put on treatment with correct diagnosis within 10 days of first consultation (doctor's delay). Almost all patients had at least one symptom suggestive of tuberculosis at presentation and mean number of consultations before diagnosis was two.

Patients who first visited private clinic had shorter doctor's delay than those who first saw government health institutions. The median total delay was three months at the time of treatment initiation. Overall patients compliance during the intensive phase of DOTS was 97%.

The study concluded that the public should be educated about the early symptoms of tuberculosis and the need to seek early medical attention particularly, those with little or no formal education.

INTRODUCTION

Among infectious diseases tuberculosis is the leading killer of adults in the world today and poses serious challenges to international public health workers. The disease has challenged and occupied the greatest minds in medicine and science, from the time of Hippocrates through Robert Koch, to an unprecedented degree. However it was only half a century ago that the first antibiotic, streptomycin, was found to be effective against tuberculosis. Still, the disease currently remains to be the largest single infectious cause of death in the world (1). The disease is especially devastating in developing countries, where it accounts for more than a quarter of all preventable adult deaths, and approximately seven percent of all deaths (2).

As in most of the developing world, tuberculosis is one of the major public health problems in Ethiopia, leading to serous morbidity and mortality (3). According to the latest national tuberculin survey, the annual risk of infection of Tuberculosis is estimated to be around 1.5%, which is within the range WHO estimates for sub-Saharan Africa(4).

Despite its enormous public health impact Tuberculosis control had been given very little attention in this country until recently.

A Tuberculosis control programme Guideline as recommended by the WHO and the IUATLD was developed and made available only in 1992.

Early diagnosis of the disease and prompt initiation of treatment is the corner stone for an effective Tuberculosis control programme.
From epidemiological perspective patient's alertness to tuberculosis symptoms leading to proper action combined with a doctor's readiness in making a correct diagnosis, play an essential role in shortening the period of spread of the infection in the community (5).

However, the objectives of a Tuberculosis treatment are not limited only to diagnosis and initiation of proper treatment, but also to ensure regular intake of drugs for an adequate period of time (6). The latter implies a good adherence to the treatment schedule. There is firm evidence that in most parts of the world treatment of tuberculosis is suffering from inferior results (7-9). due to irregular drug taking practice and premature termination of treatment mainly by self discharge (5). Though the actual magnitude of compliance from tuberculosis treatment in Ethiopia is not studied in a large scale there are indications that compliance to the treatment is alarmingly low (10,11).These studies also have shown that compliance starts to decline right from the first month of treatment and reaches peak in the third and forth month of treatment. Good compliance in the first months of treatment is especially important in short course treatment regimens, as the initial two months of this intensive therapy cures about 80% of new smear-positive cases. A high drop-out rate from short course therapy enhances the acquired resistance to rifampicin (12).

This study is designed to describe treatment initiation patterns and compliance to anti-tuberculosis therapy in Region 14 (Addis Abeba). The information generated will be useful to improve the control programme in the country.

The reasons why Region 14 was chosen for the study were:

1. The region is the only place where a large number of health institutions and tuberculosis patients could be found within the time frame available for the study.

2. It is one of the few regions where 'directly observed therapy short course'(DOTS) programme is implemented for all newly diagnosed patients and this makes it convenient for assessing compliance rate in the initial intensive phase of DOTS programme.

LITERATURE REVIEW

MAGNITUDE OF TUBERCULOSIS

World wide one person is infected with tuberculosis every second. One third of the world's entire population is infected with the tuberculosis bacilli at any given time. In the next decade it is estimated that 300 million more people will become infected with the bacilli Of which 90 million people will develop the disease and 30 million will die. Currently tuberculosis kills more adults each year than AIDS, malaria and tropical diseases combined (13).

The global resurgence of tuberculosis is being accelerated by the spread of HIV. In 1995, about one third of the 17 million HIV infected people world-wide were co-infected with M.tuberculosis. Seventy percent of the co-infected people live in sub-Saharan Africa, 20% in Asia and 8% in Latin America and the Caribbean.

Tuberculosis is already the leading cause of death among people who are HIV positive, accounting for almost one third of fatalities world-wide and about 40 percent in Africa. Preliminary studies have shown that it is the leading opportunistic disease in 50-70 percent of AIDS patients in developing countries (14).

Resurgence of tuberculosis has also been observed in industrialized countries where the disease was believed to have been vanquished for the most part a generation ago. Migration, international travel and tourism are increasingly allowing Tuberculosis to penetrate borders. In the United States, one third of all tuberculosis cases are foreign- born individuals, while in many other industrialized countries one half or more cases are foreign-born (13).

GLOBAL STATUS OF TUBERCULOSIS CONTROL PROGRAMME

Recognizing that the tuberculosis epidemic is getting out of control in many parts of the world, the WHO declared tuberculosis to be a global health emergency in April 1993. The main strategy being to provide standardized, effective short course chemotherapy to all tuberculosis patients with emphasis on cure of sputum smear-positive cases. The targets for global tuberculosis control are: (1) To cure at least 85% of the newly detected smear positive tuberculosis cases and (2) To detect at least 70% of existing cases by the year 2000.

The WHO policy for achieving these targets includes five key elements:

1. government commitment to an effective control program.

2. case detection through predominantly passive case finding

3. administration of standardized short- course chemotherapy to at least all sputum smear-positive cases under proper case management conditions (i.e. supervised administration of drugs) at least for the first 2-3 months.

4. establishment and maintenance of a system of regular drug supply, and
5. establishment and maintenance of an effective monitoring system for program management and evaluation (15).

According to WHO, only 10 percent of the world's tuberculosis patients are being treated with the DOTS regimen currently if the DOTS regimen were used throughout a dozen large countries such as Bangladesh, Brazil, China, Ethiopia, India, Indonesia, Mexico, Nigeria, Pakistan, Russian Federation, South Africa, and Zaire- nearly three-fourths of the world's Tuberculosis cases could be cured. However only a few of these countries were committed to establishing and expanding tuberculosis control programme based on DOTS due to resource limitation (13).

TREATMENT INITIATION

In developing countries, where about 80 percent of the world's cases of tuberculosis are found, for treatment initiation emphasis has been placed on passive case finding mainly through direct microscopic examination of sputum specimens obtained from persons who present themselves to the general health services. The feasibility, efficacy, specificity and low cost of the sputum examination has made it an important diagnostic tool for the developing world (16,17). Another diagnostic approach, mass miniature radiography, has been tried widely in developing countries. However, it is not recommended because of its cost and low yield (17).

Case diagnosed via active case finding is generally a less viable option in tuberculosis control programmes, because of the relative less number of tuberculosis cases in communities. Hundred individuals need to be screened before identifying a single case. Another reason is that though, patients with less advanced disease respond more readily to chemotherapy, their treatment compliance may be poorer than in those diagnosed via passive case findings, in whom, suffering is probably an important motivation to take medication (17).

Passive case finding has also its own problems and has caused considerable delay in initiation of treatment. Some of the reasons are:

limited access of health services in countries where the general health service coverage is low,

perceived severity of illness,

social and cultural beliefs about the disease,

knowledge about the disease by patients particularly its signs and symptoms, and stigmatization caused by the disease. A single or a combinations of these factors may cause delay in the initiation of treatment (18-21).

The other important issue in passive case finding is that it requires alert and motivated health personnel. Many patients fail to be diagnosed despite repeated attendance at clinics with the classic signs and symptoms of tuberculosis due to either lack of diagnosis suspicion or lack of skills on the side of the health workers (22-35).

Errors made by physicians have contributed in many ways such as: misinterpretation of chest radiographs, disregard of radiographic reports suggesting tuberculosis (29), omission of tuberculin tests(29), failure to obtain an adequate number of sputum samples (27,28,38), failure to include Tuberculosis in the differential diagnosis of non resolving pneumonia, and willingness to accept diagnosis of malignancy with out tissue confirmation (especially in the elderly) (27,31,37).

Apart from these doctor-related issues, additionally a number of specific patents features have been identified to have contributed for the misdiagnosis of Tuberculosis and treatment initiation: lack of pulmonary symptoms (27), inconsistent laboratory data, including negative tuberculin skin test (37) advanced age (36) and associated diseases that alter cell- mediated immunity(37,38).

Recently the notion of 'delays' in case-finding has been introduced for a quantitative assessment of case- finding. According to this idea, the time lapse from the onset of disease until the start of effective treatment is divided into two parts, the first being the patient's responsibility and the second that of the doctor's. The former is called 'patient delay',i.e. the time interval from the appearance of symptoms of the disease until the first visit to a medical facility, and the latter 'doctor's delay',i.e. the time interval from the first consultation with the patient to the start of treatment under the diagnosis of tuberculosis. 'Total delay' is the sum of these two delays (Figure 1).

In a study in south Africa it has been shown that delay in presentation ('patient delay') was shorter than the delay in diagnosis ('doctor delay'). The same authors have also indicated that easier access to health care facilities may shorten the 'patient delay' while a great degree of diagnostic suspicion and proper investigation of patient may shorten the'doctor delay' (40).

An investigation in Australia found that only 31% of patients commenced treatment within 30 days of onset of symptoms. This was for both smear positive and negative cases, most of these were investigated by private doctors (41). Another study in Malawi on delays in diagnosis and treatment of smear positive tuberculosis showed that there were long delays from the time of admission to diagnosis and start of anti-Tuberculosis treatment (42).

A study on analysis of case finding process of tuberculosis in Korea showed that the average time between the onset of symptoms and initial medical consultation was 1.8 months (patient 's delay). nearly 80% of all cases were diagnosed as tuberculosis within the first 2 weeks. In the same study, health centers diagnosed cases faster than private clinics and thus had a shorter doctor's delay (43). A similar survey in Kenya revealed that there is long 'doctor's delay' even for patients who presented with relevant respiratory symptoms (44).

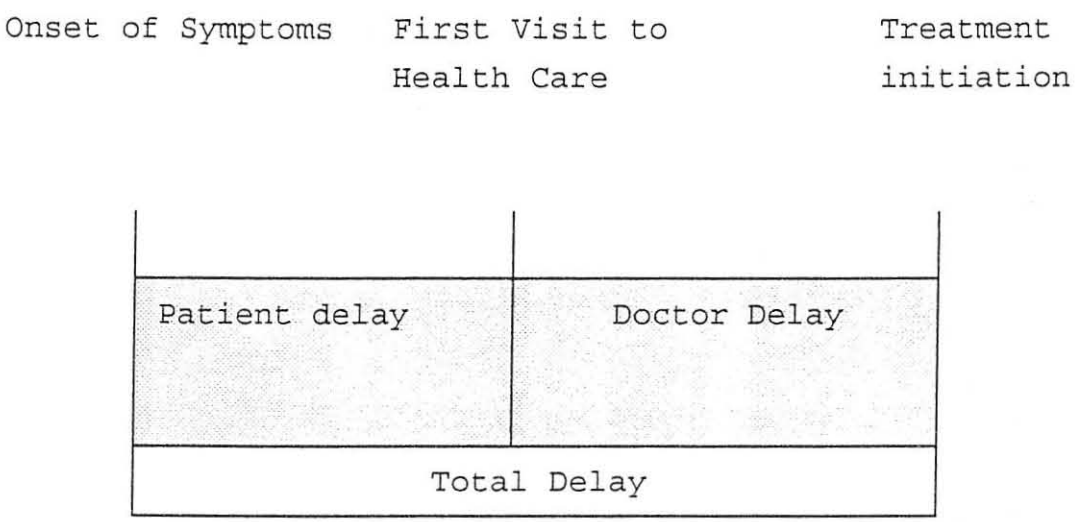

Fig. 1: PROCESS OF PASSIVE CASE-FINDING

In 1994, a Malaysian study also showed that the median time from the onset of the illness until the initial medical consultation (patient delay) was two weeks. Delay was longer in male patients who had lower education level and drug abusers. Almost all patients had at least one symptom suggestive of tuberculosis at presentation and the mean number of consultations before diagnosis was three. Patients who first visited government medical facilities had shorter doctor's delay than those who first saw private practitioners (45).

Another study in Nepal has been shown that the total delay is longer among female in old age group and those who consulted Faith Healer. The author subsequently recommended that training to the faith healer may be one of the possibilities to improve case finding programme (46). Politis (47) has also reported that the mean total delay of 3.5 months in Greek. Less educated and industrial or agriculture workers, without threatening symptoms showed the highest patient's delay in this study.

TREATMENT COMPLIANCE

Since physicians first began to prescribe therapies to patients, the effect of their prescriptions has been impeded mainly by lack of advice and participation in the recommended course of action. Hippocrate himself recognized the problem and counselled that physicians "...should keep aware of the fact that patients frequently lie when they state they have taken certain medication" (48). Obtaining patient cooperation with prescribed regimen remains one of the biggest challenges to effective health care delivery. Various studies have tried to measure treatment compliance. Davis estimated that on average, one- third of all patients will fail the heed their physician's advice (49), Joslin in his work with diabetics, observed that a significant proportion of patients presenting with ketoacidosis had poor compliance to their insulin regimen (50), and Mohler has demonstrated that 32% of mothers of the children with streptococcal pharyngitis had failed to give their children the complete recommended course of pencilline (51).

With most disease process, maximizing patient compliance is simply a matter of maximizing the effectiveness of the medical therapy and the consequences of an individual patient's decision not to adhere to therapy will primarily affect only the patient. However, in the case of communicable disease such as Tuberculosis, the situation is quite different . It is believed that, on average each case of active Tuberculosis infects three individuals before being detected and treated (52). The longer an active case remains undiagnosed, or in the case of non-adherence to treatment, there is a greater chance of spreading the infection to others. Poor patient compliance has been, and remains, the principal cause of anti-Tuberculosis treatment failure in both developing and developed nations. In addition to failing to completely cure patients, the danger of cultivating resistant strains of bacilli is also becoming a growing problem (53-57).

FACTORS AFFECTING PATIENT COMPLIANCE

Numerous studies have demonstrated that compliance to medical therapy is strongly correlated with severity of symptoms. In most cases when a patient feels better or when the symptoms which drove the person to seek therapy are gone. there is a tendency to stop taking medication (58,59).

However, symptoms alone are not enough to ensure compliance. Even in the face of immediate and potentially dangerous consequences to such behaviour a significant proportion of patients were observed failing to continue taking medications. For example Cramer reported that breakthrough seizures were most frequently associated with noncompliance to anticonvulsant therapy (60). Thus while the desire to treat symptoms affects compliance in a positive manner, the desire to avoid recurrence of the same symptoms, or the desire to prevent what would appear to be a predictable outcome is not enough to ensure continued compliance.

Duration of therapy has also been shown to have an effect on patient compliance. long term treatments are consistently associated with poor patient compliance (58-62).

Another variable that is commonly thought to affect compliance is the side effect(s) associated with medication. Although every medication has a side effect profile that may render it intolerable to some patients, this reality alone is rarely believed to be the reason for non compliance. Simpson demonstrated that patients receiving out patient treatment for Tuberculosis frequently cited side effects as a reason for non compliance to Para- aminosalicylic acid (PAS), yet the same patient population tolerated the same doses of PAS during inpatient treatment without difficulty (63).

A patient's contact and relationship with the physician is also another factor which affects compliance to therapy. Compliance tends to improve around the time of clinic appointment and decline in between. This has been termed as "the white coat effect" (64,65). Ineffective communication between the physician and the patient could be the cause of poor compliance (66). In one study after 4 minutes of health communication patients were able to recall less than 50 percent of the information given to them by the physician (67). Language and cultural barriers have been shown to play a part in reducing the effectiveness of the physician/patient interaction and subsequently reducing the rate of compliance to therapy. Information presented in the patient's primary language and in terms that are culturally relevant to patient has the most impact (68,69).

III. OBJECTIVES

GENERAL OBJECTIVE

To determine treatment initiation and compliance among tuberculosis patients in Addis Ababa.

SPECIFIC OBJECTIVE

1. To describe treatment initiation patterns among tuberculosis patients.

2. To determine treatment initiation practice of doctors.

3. To assess the degree of compliance to anti-tuberculosis treatment in newly diagnosed patients.

4. To identify factors influencing anti-tuberculosis treatment initiation and compliance.

METHODS

STUDY DESIGN:

Descriptive and longitudinal study with internal comparison.

STUDY AREA:

The study was conducted in Addis Ababa, (Region 14) the capital city of Ethiopia. Addis Ababa administration is divided into 6 zones and 28 woredas. The total population of the region is estimated to be about 2.5 million. The male to female ratio is about 1:1.

The region has 14 hospitals 17 health centers and 5 health stations owned by the government. In the private sector there are 233 clinics and 3 Hospitals. The doctor to population ratio is 1:11793.

According to the health profile of the Region, tuberculosis has been consistently among the 10 top diseases and it stood first as a cause of hospital admission and death in 1996/97. Inthe region all the 17 governmental health centers have tuberculosis follow up and treatment clinics. The treatment is provided free- of-charge. The role of the private sectors and other governmental health institutions in Tuberculosis control programme in the region is limited to referral of tuberculosis patients to the health centers for treatment and follow up after having made the diagnosis of tuberculosis. Addis Abeba is one of the few regions where DOTS programme is implemented in the country.

STUDY PERIOD:

Recruitment into the study was done from May 9 to July 25 1997. and all patients enrolled into the study were followed until they completed the initial intensive phase; i.e. for two months

SOURCE POPULATION:

All tuberculosis patients diagnosed in Addis Ababa health institutions during the study period.

STUDY POPULATION:

All newly diagnosed tuberculosis patients attending their follow-up treatment in Addis Ababa governmental health centers during the study period were the actual study population.

INCLUSION CRITERIA:

All new cases of tuberculosis residing in Addis Ababa, patients who consented to participate, aged 15 and above were included.

EXCLUSION CRITERIA:

Patients not residing in Addis Ababa, and tuberculosis patients who were already on treatment, aged below 15 and patients who refused to participate in the study were excluded from the study.

SAMPLE SIZE:

The sample size requirement for this study was estimated to be 626. The following are the assumptions used in the calculation: a 10% difference in compliance expected to be detected between educated and uneducated patients, with 95% certainty, 80% power and expected difference between the sample and population value of 5%. The study aims at a sample size of 626 with a 20% contingency. Sample size calculations were made using Epi-Info version 6 statistical package.

SAMPLING METHOD

Patients were recruited from all 17 governmental health centers in Addis Ababa. Recruitment were done in all health institutions until the required sample size is reached.

VARIABLES

DEPENDENT VARIABLES:

1. Anti-tuberculosis treatment initiation.

2. Compliance to anti-tuberculosis treatment.

INDEPENDENT VARIABLES:

- Socio-demographic: Age, Sex, Education, Religion, Ethnicity, Marital status, Employment status, etc.
- Knowledge about the disease and treatment.
- Attitude about the disease and treatment.

METHOD OF SCORING:

A scoring method was used for comparison of signs/symptoms, and general knowledge about tuberculosis with Socio-demographic factors. A score was given in such a way that for correctly responded items (Questionnaire 26-33) a score of one was given for those who answered I don't know 0.5, otherwise a score of zero was given for wrong answers.

OPERATION DEFINITIONS

[1] **PATIENT DELAY:** The time interval from the appearance of signs and symptoms of the disease until the first visit to a medical facility.

[1] **DOCTOR DELAY:** The time interval from the first consultation until the start of treatment under a diagnosis of tuberculosis.

[1] **TOTAL DELAY:** Total delay is the sum of patient delay and doctor delay, i.e. the time interval from the first appearance of signs and symptoms to the start of anti-tuberculosis treatment.

[1] **TREATMENT INITIATION:** The time at which anti-tuberculosis treatment is initiated.

[2] **TREATMENT COMPLIANCE :** The completion of anti-tuberculosis treatment by the patients without any interruption as prescribed by the attending health workers.

[2] **TREATMENT NON COMPLIANCE:** Three or more consecutive days of absence in the first two months of the initial intensive phase of treatment.

---

[1] Adopted from Int.J. Tuberc Lung Dis 1997;(4): 326-332

[2] Adopted from the Tuberculosis treatment guidelines, MOH

DATA COLLECTION:

In order to facilitate the data collection process, discussions about the objectives of the study were held with regional and zonal health officials and permission obtained. Letters were then written by them to each health center. describing the purpose of the study and requesting collaboration on behalf of the researcher. A questionnaire was initially prepared in English and later on translated into Amharic. The questionnaire was pretested in 4 of the health centers prior to the start of the actual study. A two day training was provided for one nurse from each treatment center. The nurses were responsible for the enrolment of patients and data collection in each centre. A follow-up form was attached to the actual treatment card to facilitate easy identification of patients enrolled into the study during subsequent visits. Patient enrolment and data collection were supervised regularly by the principal investigator.

DATA ANALYSIS

The data was processed using EPI Info version 6 statistical package for frequencies, proportions rate ratios additionally SPSS statistical programm was also used for multivariate analysis.

ETHICAL CONSIDERATIONS

Informed consent was obtained from each patient enrolled into the study after explaining the purpose and procedures of the study. Confidentiality of information was assured. There was no harm inflicted to the study subjects because of their participation into the study. Treatment of tuberculosis was free for all patients. The study protocol and ethical clearance was obtained from department of community health and the faculty ethical committee.

RESULT

1. DEMOGRAPHIC AND CLINICAL CHARACTERISTICS

A total of 765 newly diagnosed tuberculosis patients were enrolled in the study between May 9 1997 and September 25 1997 . of these, 417(55%) were males and 348 (45%) females. The mean age was 31 years. About 84% of the patients were orthodox Christian, 50% were single(never-married) while currently in union (married) patients comprised 36% of the study population. Over all, 16.1% of the patients were illiterate In terms of occupation 56.3% had no job, 11.8% were government employees, 10.6% daily labourers, and the rest includes students, merchants and house-wives (Table 1).

Five hundred sixty eight (74%) presented with pulmonary tuberculosis signs and symptoms. Of the 559 patients who were examined for AFB, 211 (28%) were positive and 541 of the patients examined by chest x-ray, 506(66%) had findings suggestive of pulmonary tuberculosis. Forty percent of the tuberculosis patients who were attending the clinics were received SCC.

At the time of treatment initiation patients were subjectively assessed during interview by nurses in charge of tuberculosis clinics. According to the nurses assessment 51.2% were mildly ill, 36.9% moderately ill and 11.2% severely ill.

TABLE 1. Socio-demographic Characteristics Of Tuberculosis Patient. Addis Ababa, Ethiopia 1997. (N=765)

Variable	Number	Percent
AGE		
15-24	259	33.8
25-34	255	33.2
35-44	147	19.2
45+	104	28.2
SEX		
Male	417	54.5
Female	348	45.5
RELIGION		
Orthodox	642	83.9
Moslem	75	9.8
Other Christian	48	6.2
EDUCATION		
Illiterate	123	16.1
Write and Read	75	9.8
Educated	567	74.1
MARITAL STATUS		
Single	385	50.3
Married	278	36.3
Other	102	13.4
OCCUPATION		
Employed	334	43.7
Unemployed	431	56.3

2. THE PROCESS OF TREATMENT INITIATION

As shown in Table 2, cough was the most frequently reported symptom (81.8%), followed by night sweating (71.0%), tiredness (68.4), chest pain (64.2%), fever (63.8%), loss of appetite (62.6%), and lymph node swelling (16.2%). More than 60% answered as they thought that it was too early to seek medical advice for them. Majority (50%) the diagnosis was made in hospitals (Table 3). The mean number of consultation before diagnosis was two.

TABLE 2. Presenting Signs And Symptoms Of Tuberculosis Patients, Addis Ababa, Ethiopia, 1997.

Symptoms	Number	Percent
Cough	626	81.8
Night sweating	543	71.0
Tiredness	523	68.4
Chest pain	491	64.2
Fever	488	63.8
Loss of appetite	479	62.9
Weight loss	370	48.4
Breathless	327	42.7
Haemoptysis	133	17.4
Lymph node Swelling	124	16.2

- Don't add-up to 100% because of multiple signs and symptoms in a single patient.

TABLE 3. Place of Initial Consultation And Diagnosis For Tuberculosis Patients. Addis Ababa, Ethiopia 1997. (N=765)

	Number	Percent
Initial consultation made at:		
Health Center	479	62.6
Government Hospital	147	19.2
Private Clinic	139	18.1
Diagnosis of tuberculosis made at:		
Government Hospital	383	50.0
Health Center	237	31.0
Private Clinic	145	19.0

3. DELAYS IN THE PROCESS OF DIAGNOSIS AND TREATMENT INITIATION.

PATIENT'S DELAY

Table 4 shows the cumulative distributions of patient's delay (failure of patients to seek prompt medical advise). Overall, 28% of the cases sought medical advise within 1 month of the onset of their illness. About 15% of the patients visited a medical facility as late as 6 month after the onset of symptoms. The median initial consultation time was 2 months and the longest delay was one and half year. Comparison of patient who sought medical advise in two months and those who sought after two months did not show any significant difference except for education level. As shown in Table 5 in the final logistic regression model uneducated patients were less likely to see a doctor within two months compared to those educated (OR=1.93, 95% CI:1.56,2.29) and a significant linear trend was oserved by educational status, with the risk of patient delay decreasing with increasing educational level. (chi square for linear trend x^2 = 25.04 and p-value 0.0001).

TABLE 4 CUMULATIVE DISTRIBUTION PATIENT'S DELAY BY SELECTED CHARACTERISTICS. ADDIS ABABA, ETHIOPIA 1997.

	% visited medical facility after onset by:				
	2wk	1mn	3mn	6mn	>6mn
TOTAL(765)	9.5	27.8	66.9	85.5	100
SEX					
Male(417)	11.2	26.8	66.6	83.6	100
Female(348)	7.4	29.0	67.2	87.6	100
AGE					
15-29yrs(426)	9.3	28.4	68.5	88.0	100
30-49 yrs(265	10.5	27.5	64.1	82.6	100
50yrs+ (74)	6.7	25.6	67.5	81.0	100
MARITAL STATUS					
Single(385)	11.1	30.6	67.7	87.5	100
Married(278)	7.1	23.7	67.2	85.2	100
Other(102)	9.8	28.4	62.7	78.4	100
AFB					
Positive(211)	9.9	28.4	65.8	85.7	100
Negative(348)	10.6	27.8	68.3	85.3	100
Not done(206)	7.2	27.1	65.5	85.4	100
DISEASE SITE					
Pulm.TB(568)	10.0	28.1	67.4	85.5	100
Ext.Pulm(197)	8.1	26.9	65.4	85.2	100
EDUCATION					
Illiterate(123)	4.0	16.2	52.0	80.4	100
Write & read(75)	4.0	17.3	61.3	85.3	100
Grade(567)	12.0	33.5	75.5	87.1	100

Table 5 RELATIONSHIP BETWEEN PATIENT DELAY AND SOCIO DEMOGRAPHIC AND CLINICAL FACTORS AMONG TUBERCULOSIS PATIENTS ADDIS ABEBA 1997.

VARIABLE	DELAY (>2mn)	EARLY (visit with 2mn)	Crude OR(95% CI)**	Adjusted OR(95% CI)
SEX				
Male(417)	206 (49)	211 (51)		
Female(348)	175 (51)	173 (49)	0.97(0.72,1.30)	1.09(0.93,1.26)
AGE				
15-29yr(426)	211 (49)	215 (51)	1.00 *	
30-49 yr(265)	131 (50)	134 (50)	1.00(0.72,1.37)	1.10(0.81,1.39)
50+yr(74)	35 (47)	39 (53)	1.14(0.67,1.92)	0.99(0.74,1.24)
MARITAL STATUS				
Single(385)	187 (49)	198 (51)	1.00 *	
Married (278)	137 (49)	141 (51)	1.03(0.75,1.42)	1.03(0.76,1.31)
Other (102)	57 (55)	45 (45)	1.34(0.85,2.13)	0.91(0.86,1.14)
EDUCATIONAL STATUS				
Illiterate(123)	79 (64)	44 (36)	3.29(1.58,6.91)	1.93(1.56,2.29)
Write &read(75)	46 (61)	29 (39)	2.91(1.31,6.53)	1.62(1.20,2.04)
1-8 (75)	122 (51)	117 (49)	1.91(0.98,3.76)	0.98(0.70,1.26)
9-12 (277)	116 (42)	161 (58)	1.32(0.68,2.58)	0.65(0.37,0.93)
12+ (51)	18 (35)	33 (65)	1.00 *	
OCCUPATION				
Employed	167 (50)	167 (50)	1.01(0.75,1.36)	1.06(0.90,1.22)
Unemployed	214 (50)	87 (50)		
AFB				
Postive (211)	105 (50)	106 (50)	1.00 *	
Negative(348)	163 (47)	185 (53)	0.89(0.62,1.27)	0.89(0.68,1.11)
Not done(206)	113 (55)	93 (45)	1.23(0.82,1.84)	1.05(0.75,1.31)
SITE				
Pulmunary(568)	271(48)	297(50)	0.72(0.51,1.01)	0.85(0.62,1.08)
Ext.pulm(197)	110(56)	87(44)		
PLACE OF FIRST MEDICAL CONSULTATION				
Health Center	246(51)	233(49)	1.26(0.84,1.88)	1.09(0.89,1.30)
Govt.Hospital	70(48)	77(52)	1.09(0.66,1.78)	0.98(0.72,1.24)
Private Clinic	62(46)	74(54)	1.00 *	

** Odds ratio and 95% confidence intereval

* Referent group

DOCTOR DELAY

As shown in Table 6, overall, 92% of cases had a doctor's delay of one month or less (a period coined as an acceptable delay). The median doctor delay was 10 days and the longest delay was 26 weeks due to atypical cases. The mean number of consultation before diagnosis was two. Cases with a doctor's delay of ten days or less and were compared with the rest of cases as indicated in Table 7. In the final logistic regression model there was no significant association in doctor's delay with regard to patients chracterstics such as sex, age, education and bacteriological status at the time of diagnosis except that doctor's delay was shorter in cases where first facility consulted was a private clinic. (OR= 1.19, 95% CI: 1.11, 1.40).

TABLE 6 CUMULATIVE DISTRIBUTION OF DOCTOR'S DELAY BY SELECTED CHARACTERISTICS ADDIS ABABA. ETHIOPIA 1997.

	% diagnosed and treated after initial consultation by:			
	2wk	1mn	3mn	6m
TOTAL N(765)	76.6	91.5	99.1	100
SEX				
Male (417)	78.6	92.3	99.0	100
Female(348)	74.1	90.5	99.1	100
AGE				
15-29yr(426)	72.2	92.4	99.2	100
30-49yr(265)	75.8	89.8	98.8	100
50yr+ (74)	75.6	91.8	98.4	100
AFB				
Positive(211)	77.7	92.4	100.0	100
Negative(348)	79.0	91.6	99.1	100
Notdone(206)	71.3	90.2	98.0	100
DISEASE SITE				
pulm(568)	78.3	91.0	99.2	100
ext.pul(197)	71.5	92.8	97.9	100
CONDITION OF PT				
Mild(392)	76.0	91.5	99.4	100
Modrate(282)	76.9	91.1	98.5	100
Severe(86)	77.9	91.8	98.8	100
EDUCATION				
Illiterate(123)	75.6	95.1	99.1	100
Write & read(75)	74.6	88.0	97.3	100
Educated(567)	73.6	91.9	99.0	100

TABLE 7 RELATIONSHIP BETWEEN DOCTOR DELAY AND SOCIO DEMOGRAPHIC, CLINICAL FACTORS AMONG TUBERCULOSIS PATIENTS ADDIS ABEBA 1997

	DELAY > 10 days	EARLY within 10 days	Crude OR) (95% CI)**	Adjusted OR(95% CI)
SEX				
Male(417)	206 (49)	211 (51)		
Female(348)	177 (51)	171 (49)	0.94(0.70,1.27)	1.04(0.87,1.20)
AGE (in years)				
15-29yrs(426)	213 (50)	213 (50)	1.00	
30-49(265)	126 (48)	139 (52)	0.91(0.66,1.25)	1.13(0.84,1.42)
50+ yrs(74)	44 (59)	30 (41)	1.47(0.86,2.50)	0.82(0.58,1.07)
MARITAL STATUS				
Single (385)	179 (46)	206 (54)	1.00	
Married (278)	147 (53)	131 (47)	1.29(0.94,1.78)	0.79(0.72,1.06)
Other (102)	57 (56)	45 (44)	1.46(0.92,2.32)	1.03(0.80,1.26)
EDUCATION				
Illiterate (123)	63 (51)	60 (49)	1.01(0.50,2.04)	0.89(0.54,1.24)
Write &read(75)	45 (60)	30 (40)	1.44(0.66,3.15)	1.27(0.85,1.68)
1-8 (239	135 (56)	104 (44)	1.25(0.65,2.39)	1.19(0.92,1.47)
9-12 (277)	114 (41)	163 (59)	0.67(0.35,1.28)	0.67(0.39,0.94)
12+(51)	26 (51)	25 (49)	1.00	
OCCUPATION				
Employed (334)	160 (48)	174 (52)		
Unemployed (431)	223 (52)	208 (48)	0.86(0.64,1.15)	0.93(0.77,1.08)
AFB				
Positive(211)	101 (48)	110 (52)	1.00	
Negative(348)	178 (51)	170 (49)	1.14(0.80,1.63)	1.07(0.86,1.28)
Not done(206)	104 (50)	102 (50)	1.11(0.74,1.66)	0.92(0.67,1.18)
DISEASE SITE				
Pulmonary(568)	283 (50)	285 (50)	0.96	
Ext.Pulm (197)	100 (51)	97 (49)	0.96(0.69,1.35)	0.98(0.75,1.21)
PLACE OF FIRST MEDICAL CONSULTATION				
Health Center(479)	252(53)	227(47)	1.74(1.16,2.61)	1.19(1.11,1.40)
Govt.Hospital(147)	77(52)	70(48)	1.72(1.04,2.84)	1.15(0.89,1.41)
Private Clinic(139)	53(39)	83(61)	1.00	

* Referent group

TOTAL DELAY

As shown in Table 8, 13.5 % of the cases were diagnosed and treated for Tuberculosis within the first one month of the onset of the illness, 55% within three months, while 18% of cases were diagnosed after six months. Cases with total delay of three months or less (420) and total delay of more than three months (345) were compared by selected patient characteristics no signficiant association was observed with any of the selected characteristics of patients except education between cases with short delay and cases with long delay.

TABLE 8 CUMULATIVE DISTRIBUTION OF TOTAL DELAY BY SELECTED CHARACTERISTICS. ADDIS ABABA. ETHIOPIA. 1997.

	% diagnosed and treated after onset within:				
	2wk	1mn	3mn	6mn	>6mn +
Total (765)	2.9	13.5	54.9	82.2	100
SEX					
Male(417)	3.1	15.8	56.1	80.5	100
Female(348)	2.5	10.6	53.4	84.1	100
AFB					
Positive(211)	2.3	9.9	47.3	83.8	100
Negtive(348)	3.1	14.9	58.3	81.3	100
Notdone(206)	2.9	12.1	51.9	82.0	100
AGE					
15-29yr(426)	3.2	13.1	55.6	85.4	100
30-49yr(265)	2.6	14.3	53.5	78.1	100
50 yr+(74)	1.3	12.1	55.4	78.3	100
DISEASE SITE					
Pulm(568)	2.6	14.0	56.3	82.0	100
Ext. Pulm(197)	8.6	11.6	50.7	82.7	100
MARITAL STATUS					
Single (385)	4.1	16.1	56.8	84.1	100
Married(278)	1.4	10.0	53.9	83.0	100
Others (102)	3.6	15.4	55.4	81.7	100
EDUCATION					
Illiterate(123)	1.6	5.6	43.0	78.0	100
Write&read(75)	4.0	8.0	42.6	76.0	100
Grade (567)	3.6	15.7	61.2	84.2	100

KNOWLEDGE AND ATTITUDE ABOUT TUBERCULOSIS

The causes of tuberculosis as perceived by the patients included: cold (43.7%), microbial agent or germ (31.2%), and supernatural cause (5.8%). One hundred forty seven (19.3%) had no idea about the cause of Tuberculosis (Table 10).

About 90% of the respondents said that tuberculosis could be transmitted from person to person through breathing and 80% believed that tuberculosis could be fatal, 86% thought there was complete cure from tuberculosis after appropriate and complete treatment, and 70% thought that treatment takes 6 to 12 months. As shown in Table 11 the most common presenting signs and symptoms of tuberculosis were known by the majority of the patients. About 58% of patients expressed that they felt depressed when they were initially told the diagnosis of tuberculosis. On the other hand few (7.2%) said that they were happy for at least that the disease from which they were suffering was identified and treatable. Nearly 13.7% of patients reported that they were ashamed of having tuberculosis, and hid the diagnosis from friends and communities due to fear of rejection.

The average knowledge score for signs and symptoms was 4.62. The t-test showed that there was significant association for education t-test= 3.903, $p < 0.001$ but there was no significant association for age, sex, marital status, income.

The average total score for general tuberculosis knowledge (signs/symptoms, cause, transmission, prevention and treatment was 8.62 the t-test showed that there was significant association for education t-test= 8.43, $p <$

0.0001 but there was no significant association for age, sex, marital status, income.

Analysis of treatment outcome Fig (2) showed that 713 (97%) were compliant during the two months of DOTS, 19 (3%) were noncompliant, 21 (3%) died and 12 (2%) were transferred out.

Table 10: PERCEIVED CAUSES, KNOWLEDGE OF SIGNS AND SYMPTOMS OF TUBERCULOSIS AMONG TUBERCULOSIS PATIENTS. ADDIS ABABA, ETHIOPIA.1997.

	NUMBER	%
CAUSE		
Cold	334	43.7
Germ	239	31.2
Supernatural cause	44	5.8
I don't know	148	19.3
SIGNS/SYMPTOMS		
Cough	726	94.9
Weight loss	722	94.4
Night sweats	716	93.6
Tiredness	715	93.5
Loss of appetite	706	92.3
Chest pains	660	86.3
Breathlessness	669	82.5
Hemopthysis	423	55.3

♦ **Multiple response % don't add up to 100.**

DISCUSSION

In this study the median patient's delay of two months is too long as compared to a median delay of two weeks in Malaysia (45) and 17 days in Japan(19). Although cough, loss of appetite, night sweating and fever were the common symptoms at the onset of illness these didn't prompt some patients to seek medical treatment early. sixty percent were not aware that their symptoms could have been manifestations of a serious medical illness. They thought that it is too early to seek medical advice and reliance on improvement without medication. The pattern of patient delay observed in this study reflect the normative health seeking behaviour in Ethiopia which is characterized by a wait-and see attitude in the case of most mild and transitory illness (20). As can be observed from this study more than 50 % thought that it was too early to seek medical advise earlier than the time consulted and were relying on improvement without medication.

The patient delay was clearly longer in uneducated patients while other major background factors showed no significant association this similar to the Malaysian study (45). Uneducated people usually externalize disease causation to supernatural causes and hence they seek treatment along that line. This contributes to the delay observed among uneducated groups therefore, health education with regard to disease causation and treatment with especial emphasis to the uneducated group might improve the situation.

In this series 62% of patients had visited a health center first while 19% had visited a government hospitals and 18% in private clinics. These results are similar to observation in Korea where 55% of patients first visited a health center but differs with the results observations in Hong Kong, where 57% of patients visited a private doctors and this reflects a good patterns of attendance of health services in this study and efforts to make public health services easier to utilize should be continued.

Comparing these findings with the distribution of medical facilities first consulted, it was observed that the role of the government hospitals was larger in detection of tuberculosis than in initial consultation for the illness. This might be diagnosis of tuberculosis is easier in hospitals because of the availability of better diagnostic facilities such as x-ray and laboratory reagents. Besides, the availability of specialized physicians in hospitals can enhance the ability to improve case detection than the rest of health institutions.

A median doctor's delay of 10 days in this study is surprisingly shorter compared with a one month delay in Japan (19) and seven weeks in Malaysia (45). This may be attributed to the longer patient's delay in Ethiopia, which in turn may make tuberculosis easier to diagnosis. In addition, the high prevalence of tuberculosis in Ethiopia may make health service providers suspicious of tuberculosis than would be expected in less prevalent situation.

Doctor's delay was also analyzed for possible association with patient's background factors and the only factor that had a significant association was the

type of medical facility initially consulted. In patients who first visited a private. clinics the doctor's delay was shorter which is different form Korean study (43). This is understandable in our set up in that private clinics have access to x-ray facilities and other diagnostic facilities which allow them to make a probable diagnosis but, further study is needed to assess the quality (accuracy) of diagnosis. In this study the number of visits made to medical facilities before diagnosis was two, which is lower than in Malaysia (45). where the mean number of visits were three.

The finding of a median total delay of 10 weeks in treatment initiation in this study is similar to that of a study in Korea (43), who reported a median total delay of three months for tuberculosis patients. The length of this delay in treatment initiation in this study is however, much longer than that of seven to eight weeks reported in more developed countries (19,45). Eventhough there is no established 'acceptable' period between onset of symptoms and commencement of treatment for tuberculosis some authors (41) feel that tuberculosis should be diagnosed and treated within 30 days of the onset of symptoms, while others (19) considered a period of less than two months as desirable. The public health implication of long periods of delay between the onset of symptoms and the initiation of treatment for the smear-positive cases is great as the period of transmission of the disease is prolonged. Close to 91 % of our smear-positive cases were still not treated at one month, 43% at three months and 17% more than six months from the onset of their symptoms. about 90% of the total delay

is contributed by patient delay.

The overall knowledge about tuberculosis in this group patients was good it was found that 95% of the patients recognized at least one of the classic symptoms of tuberculosis this finding was in congruent with a study from south Africa (18). Patients knowledge of the cause of tuberculosis didn't appear to be as good as their knowledge about other aspects of the disease. The most common misconception was that tuberculosis is caused by cold. This belief might be extrapolated from the observation made that respiratory infections are more common when the weather is cold than in other seasons. similar observation was made in the South Africa study (18).

The results of this study indicate that there was an association between education and knowledge of symptoms of tuberculosis ($F=4.206$, $p=0.001$) and general knowledge on tuberculosis ($F=10.57$, $P<0.0001$) which supports the other research findings (21) on the relationship between educational status and knowledge on the disease. Besides, it was observed, in this study, that uneducated showed more delay (OR= 1.93) than educated which indicated a congruence of knowledge and practice.

Before 1994 the tuberculosis control program in the region was not well organised and patients received unsupervised out patient treatment. case control study of 423 consecutive patients showed that only 82% had completed the intensive phase (11).

Recently regional health bureau tuberculosis policy was introduced and all tuberculosis clinics staff attended a refresher course.

Our finding shows that overall patients compliance during the intensive phase of DOTS was 97%. probable reasons for good case-holding in this study might be close daily supervision of and health education at tuberculosis clinics, In addition patients were asked to bring an important member of the family before commencing treatment and oriented on the importance of an interrupted and complete treatment, then they were made a sort of guarantor for the good conduct of the patient. The success of these approach might have given a better compliance rate in this study.

STRENGTHS AND LIMITATIONS OF THE STUDY

Although this study is believed to contribute a lot in the understanding of treatment initiation and compliance pattern among tuberculosis patients in this country there are strengths and limitations in application of the study.

The results of the study are assumed to be valid, as a wide representation was achieved by including all tuberculosis follow up clinics.

Information bias was minimized by using a standard, closed-ended and pretested questionnaire administered by trained interviewers and regular supervision. logistic regression was utilized for control of confounding. Besides, as the study was based on the responses given by patients it is susceptible to limitations of recall bias that can affect the finding in both directions. Inaddtions, the study time is restricted to intensive phase undermines the overall noncompliance rate as patients are expected to be noncompliants at the continuation phase.

CONCLUSION AND RECOMMENDATION.

The study demonstrated that many tuberculosis patients didn't seek medical advice earlier and this study revealed that the patient's delay was clearly larger in uneducated patients.

Results of this follow up study on treatment compliance revealed that 97 % of the patients did complete their initial intensive phase. However this should be taken cautiously as noncompliance rate is lower in the intensive phase tuberculosis treatment but, patients likely to be smear negative in the intensive phase and the higher compliance rate can decrease transmission of the disease.

On the basis of the above finding of the study the following recommendations were made.

1. The public should be educated about the early symptoms of tuberculosis and the need to seek early medical attention particularly at those with little or no formal education.

2. Further study in determine the treatment initiation and compliance patterns in rural set up recommended.

3. A long term prospective study is recommended to detect noncompliance at continuation phase inorder to determine the overall magnitude of compliance rate.

4. Further study is needed to assess quality of tuberculosis diagnosis in the different health institutions.

REFERENCE

1. Kochi A The global tuberculosis situation and the new strategy of the world health organization. Tubercle 1991;72:1-6

2. Oxford University press. The health of adults in developing World New York: 1992, p142

3. Ministry of Health. Guideline for the national tuberculosis control programme in Ethiopia. August 1992, Addis Ababa.

4. Azbite M. Tuberculin survey in Ethiopia. Kekkaku 1991;67:8539-8544.

5. Toman K. Tuberculosis case finding and chemotherapy questions and answers. WHO. Geneva 1979, p113.

6. Chaulet P. Treatment of tuberculosis: case holding until cure. WHO/Tuberculosis/83.141 1983

7. Menzies R.,Rocher I. and Visseandjec B. Factors associated with treatment of tuberculosis. Tubercle Lung Dis.1993 74: 32-33

8. Jim B.W.,Kim S.C., Mori T.and shimao T. The impact of intensified supervisory activities on tuberculosis treatment Tubercle Lung Dis. 1993;74,267-268.

9. Chaulet P. Compliance with chemotherapy for tuberculosis. Responsibilities of the health Ministry and of physicians. Bull.Int.Union Tubercl. Lung Dis. 1990;66;33-34.

10. Hodes RM, and Azbite M. Tuberculosis. In Ecology of Health and Disease in Ethiopia.eds Kloos and Zein AZ. westview press, colorado, USA. 1993. p 265-284.

11. Demissie M and Kebede D. Defaulting from tuberculosis treatment at Addis Ababa Tuberculosis center and factors associated with it. Ethiop. Med.J.1994;32: 97-106

12. Fox W. Short-course chemotherapy for pulmonary tuberculosis and some problems of its programme application with particular reference to India. Bull. Int. Union Tubercl.Lung Dis.1985;60:1-2.

13. WHO. TB, a global emergency. WHO report on Tuberculosis epidemic WHO/Tuberculosis/94 177:1-28.

14. WHO TB in the era of HIV. WHO/TB/96.204.

15. WHO TB/HIV. A clinical manaual WHO/TB/96.200

16. Chonde TM. The role of bacteriological service in the National Tuberculosis and Leprosy programme in Tanzania. Bull int Union Tuberc. Lung Dis 1984;64:37-39

17. WHO Expert committee on Tuberculosis 9th Technical report series 552 WHO, Geneva 1974.

18. Metcalf C.A, Bradshaw D, Stindi W.W. Knowledge and beliefs about tuberculosis among non-working women in Ravensmead, Cape Town. S. Afr. Med. J 1990;77:408-412.

19. Aoki Shaimao M.T. Studies on factors influencing patient's doctor's and total delay of Tuberculosis case detection in Japan. Bull Int Union Tuberc 1985; 60:128-130.

20. Kloos H, Etea A, Degefa H. Illness and health behaviour in Addis Ababa and rural central Ethiopia. Soc Sci Med 1987;25:1003-1019.

21. Westaway MS. Knowledge, beliefs and feelings about tuberculosis. Health Ed. Res 1989;4:205-211

22. Farber JE, Clerk WT. Unrecognized Tuberculosis in a general hospital Am. Rev. Tuber. 1943;47:129-134.

23. Jacob S, Greenberg HB. Diagnosis and treatment of 20 tuberculosis patients who entered a community hospital. Am. Rev Respir Dis 1972; 105: 528-531

24. Ashba Jk, Boyce JM. Undiagnosed tuberculosis in general hospital. Chest 1972;61:447-451

25. MacGregor RR. Ayear's experience with tuberculosis in a private urban teaching hospital in the post-sanatorium era. Am. J. Med. 1975;58: 221-228

26. Furey WW, Stefancie MF. Tuberculosis in a community hospital: a 5 year review JAMA 1976; 235: 168-176

27. Bobrowitz ID. Active tuberculosis undiagnosed until autopsy Am.J.Med 1982;72:650-658

28. Page MI, Lunn JS. Experience with tuberculosis in a public teaching hospital Am.J.Med 1984;77:667-670

29. Craven RB, Wenzel RP, Atuk No. Minimizing tuberculosis risk to hospital personnel and students to unsuspected disease. Ann Intern Med 1975;82:628-632

30. Greenbaum M, Beyt BE, Murray PR. The accurcy of diagnosing pulmonary Tuberculosis at a teaching hospital Am. Rev Respir Dis 1980;21:447-481

31. Huber GL, Miller RD. training of undergraduate medical school students in pulmonary disease. A regional analysis of New England Medical schools. Chest 1976;70:267-273

32. Byrd RB,Horn BR, Solomon DA,Griggs GA, Wilder NJ. treatment of tuberculosis by the non pulmonary physician Ann Intern Med 1977;86:799-802

33. Rosenthal T, Pitlik S, Michaeli D Fatal undiagnosed tuberculosis in Hospitalized patients J.Infect Dis 1975;131(suppl):51-56

34. Edlin GP. Active tuberculosis unrecognized until necropsy. Lancet 1978;1:650-652

35. Enarson DA, Gryzbowski S,Dorken E. Failure of diagnosis as a factor in tuberculosis mortality. Can Med Assoc. J.1978;118:1520-1522

36. Counsell SR,Tan JS, Dittus RS. Unsuspected pulmonary tuberculosis in a community teaching Hospitals. Arch Intern Med 1994;154:306-310

37. Katz I, Rosentahal T, Michaeli D. Undiagnosed tuberculosis in Hospitalized patients Chest 1985;58:770-774

38. Kramer F, Modilevsky T, Waliamy AR, Leedom JM, Barnes PF. Delayed diagnosis of tuberculosis in patients with human immunodeficiency virus infection Am J Med 1990; 89:451-456

39. Benerji D, Anderson S. A Sociological study of awareness among persons with pulmonary Tuberculosis. Bull World Health Organ. 1963; 29:665-683.

40. Beyers N, Gie RP, Schaaf HS,el al. Delay in diagnosis, notification and initiation of treatment and compliance in childern with tuberculosis. Tubercle Lung Dis 1994;75(4):260-265.

41. Pirkis GE, Speed BR, Yung AP,el al. Time to initiation of anti-tuberculosis treatment. Tubercle and Lung dis 1996;77:401-406

42. Harries AD, Kamenya A, Namarike D el al. Delays in diagnosis and treatment of smear- positive tuberculosis and the incidence of tuberculosis in Hospital nurses in Blsntyre, Malawi. Trans. Roy.Soc of trop. Med and Hyg. 1997;91:15-17

43. Mori T, Shimao T, Byoung Won Jin el al. Analysis of case- finding process of tuberculosis in Korea. Tubercle and Lung dis 1992;73:225-231

44. Aluoch JA. A servey of assess passive case- finding in pulmonary tuberculosis in Kenya. East African Medical Journal 1983;60: 360-366.

45. Hooi-LN. Case- finding for pulmonary tuberculosis in Penang Med.J.Malaysia 1994; 43(3):223-230

46. Onozaki,T. Analysis of case- finding process of tuberculosis in the National tuberculosis programme in Nepal Tubercle and Lung Dis 1994;75:51-52

47. Politis,G.,Toumbis, M.,Zarmbis el al. Patient's and doctor's delay in Greek Tuberculosis patients. Tubercle and Lung Dis supp.1995;32-33

48. Lasegma L. fault and defult. N. Engl.J. Med 1973; 289:267-268

49. Davis MS. Predicting non-compliant behaviour. J. Health soc Behav 1967;8:265-271

50. Joslin EP, Root FH, White P, et al (Eds). The treatment of diabetes Mellitus (8th ed).London: Henry Kimpton,1947 p.225

51. Mohler DN,Wallin DG, Dreyfus EG. Studies in the home treatment of streptococcal disease. Failure of patient to take penicillin by mouth as prescribed. N Engl J. Med 1955;252:1116-1118

52. Sbarbaro JA. Strategies to improve compliance with therapy Am. J. Med 1985;79;34-37

53. Van der Werf TS, Dade GK, Van der mark. Patientcompliance with tuberculosis treatment in Ghana: factors infulencing adherence to therapy in rural service programme.Tubercle 1990;71:247-252

54. Fox.W. Compliance of patients and Physicians Experience and Lessons from tuberculosis. BMJ 1993;287:33-37 and 101-105

55. Shears P. tuberculosis control in Somali refugee camps. Tubercle 1984; 65: 111-116

56. Chuah SY. Factors associated with anti tuberculosis therapy in North west perak, Malaysia. Tubercle 1991;72:261-264

57. Eestaway MS, Conradie Pw, Remmers L. Supervised out patient treatment for tuberculosis: evaluation of a South African rural programme. Tubercle 1991; 72: 140-144

58. Bergman AB,Werner RJ. Failure of childeren to receive penicillen by mouth N.Engl J.Med.1963;268:1334-1338

59. Shears P. Tuberclosis control in Somali refugee camps. Tubercle 1984;65: 111-116

60. Cramer JA,Meltson RH, Prevey ML, el al. How often is medication taken as prescribed? A novel assessment technique. JAMA 1989;261:3273-3277

61. Combs DL, O' Brien RJ, Geiter LJ. USPHS tuberculosis short-course chemotherapy trial 21:Effectiveness, toxicity and acceptablity.Ann Intern Med 1990;112:397-406.

62. Latoilais CJ,Berry CC. Misuse of prescription indications by out patients. Drug intel clin pharm 1969;3:270-277

63. Simpson JMCD. Simple tests for detection of urinary PAS Tubercle 1956:37:333-340

64. Cramer JA.Scheyer RD, Mattson RH. compliance declines between clinic visits Arch Intern Med 1990;150:1377-1378.

65. Feinstein AR. White-coat effects and the electronic monitoring of compliance. Arch. intern. med 1990;150:1377-1378

66. Sbarbaro J. Patient compliance with preventive therapy. operational considerations Bull Int Union Tuberc lung Dis 1990/1991; Supplement : 37-39.

67. Ley P, Bradshaw PW, Eaves D. A method for increasing patient's recall of informationpresented by doctors Psychiatry Med 1973;3:217-220

68. Manson A. Language Concordance as a determinat of patient compliance and emergency room use in patients with asthma. Med.care 1988; 26:1119-1127

69. H.Jean C.Wiese: Tuberculosis in rural Haiti. Soc Sci & Med 1974;8:359-362.

Form 1 **TUBERCULOSIS STUDY IN ADDIS ABABA**

Department of Community Health,

Addis Ababa University

PATIENT QUESTIONNAIRE

Name of the health institution: _____

Institution Code: ____/____

Patient Code Number: ____/____/____/____

Date: ___/____/____

SECTION I. Identification

1. Name of patient: _____
   self father

2. Who is responding to the questionnaire?

   1. self 2. parents/guardians 3. relatives
   4. other(specify) _____

3. What is the sex of the patient?
   1. Male 2. Female

4. What is the age of the patient? |_____|_____| year

5. What is the religion of the patient?
   1. Moslem 2. Orthodox 3. Catholic
   4. Other Christian 5. Other(specify) _____

6. What is the ethnicity of the patient?
   1. Amhara 2. Oromo 3. Tigrie
   4. Gurage 5.Other(specify)_____

7. What is your marital status?

1. Married 2. Never married 3. Widowed

4.Divorced 5. Separated

8. What is your occupation? _____

9. What is your average monthly income? |___|___|___|___|

10. What is your educational status?

0. Illiterate 66. Read only

77. Write and read 1. Educated, last grade completed: |___|___|

SECTION II: Present Illness

11. What is/are you main complaint(s) that made you to seek medical advise?

1. Cough 2. Loss of appetite

3. Night sweating 4. Chest pain 5. Fever

6. Haemoptysis 7. Tiredness

8. Breathlessness 9. Weight loss

9. Body swelling 10.Lymph node swelling

11.Other(specify)_____

12. How long have you been ill with the above complaint? |____|____| weeks

13. Is it your first time to seek advise for the illness?

1.Yes 2. No

If no:

13.1 After how many days after the appearance of the above first symptoms did you seek medical care? |___|___| days

13.2 Where did you go for medical care?

1. Local health centre
2. Local hospital
3. Traditional healer
4. Private clinic
5. Pharmacy

..... other(specify) _____

If yes

13.3 Why didn't you seek medical advise until now?

1. I thought it is too early to seek medical advise
2. I thought that I can get well without treatment
3. I was using traditional medicine
4. I live far away from health institutions
5. I didn't have money
6. Fear of waiting for too long in the health institution
7. Behaviour of health worker is not conducive
8. Other (specify)_____

14. Can you tell us from what disease your suffering from now?

1. Tuberculosis 2. Other (specify) _____

15. When was you told that you actually have tuberculosis? |____|____| days ago

16. What did you feel when you were told that you have TB?

_____

17. How many days did you spend in the health institution before you are told the final diagnosis(that you have tuberculosis)? |____|____| days

18. Did you start taking the drugs? 1. Yes 2. No

If yes:

18.1 When did you actually start taking the drugs after you were first told that you have tuberculosis? |____|____| days

19. Have you started any treatment before coming to this health institution?

0. No 1. Yes

20. Who advice you to come to this health institution?

1. Self 2. Parents/guardians 3. Relatives
4. Friends 5. Health personnel
6. Referred from other governmental health institute
7. Referred from a private clinic
8. Other (specify)_____

21. Do you feel shy to tell to people that you have tuberculosis?

1. Yes 2. No

22. If yes to question 21:

What is the reason being shy?

1. Fear of divorce
2. Fear of rejection by the community
3. Fear of loosing the job
4. Fear of being known by somebody else
5. Fear of loosing friends
6. Other(specify):_____

23. Is there any thing that might create problem in your in following up your tuberculosis treatment?

1. Nothing 2. Shortage of time
3. Shortage of money/drug too expensive
4. Distance of the health institution
5. Physician behaviour
6. Fear of shortage of drugs
7. Fear of side effects
8. Other(specify) _____

24. What means of transportation do you commonly use to come to this health institution?

1. On foot 2. Taxi 3. Bus 4. Private car
5. Other(specify)_____

25. How long time does it take you to reach this health institution on foot? ____hr and ____min

26. What is the cause of tuberculosis?

1. Evil spirit 2. Supernatural cause 3. Microbial agent or germ

4. Other (specify)_____

27. Do you think that tuberculosis can be transmitted from one person to another?

1. Yes 2. No 3. Don't know

28. How is tuberculosis transmitted from person to person?

1. by shaking hands 2. through air droplet

3. through injection 4.other(specify)_____

29. What are the signs and symptoms that a tuberculosis patient might have?

26.1 Diarrhea	1. Yes 2. No 3. Don't know
26.2 Cough	1. Yes 2. No 3. Don't know
26.3 Vomiting	1. Yes 2. No 3. Don't know
26.4 Loss of appetite	1. Yes 2. No 3. Don't know
26.5 Weight loss	1. Yes 2. No 3. Don't know
26.6 Night sweats	1. Yes 2. No 3. Don't know
26.7 Chest pains	1. Yes 2. No 3. Don't know
26.8 Headache	1. Yes 2. No 3. Don't know
26.9 Haemoptysis	1. Yes 2. No 3. Don't know
26.10 Breathlessness	1. Yes 2. No 3. Don't know
26.11 Tiredness	1. Yes 2. No 3. Don't know
26.12 Body swelling	1. Yes 2. No 3. Don't know
26.13 lymph node enlargement	1. Yes 2. No 3. Don't know

30. How can one get complete cure from tuberculosis?

1. modern medicine 2. traditional medicine

3. holy water 4.other(specify)_____

31. How long does a complete treatment of tuberculosis take for one person to get a complete cure? |____|____| months

32. Do you think that one can get a complete cure for tuberculosis?

1. Yes 2. No 3. Don't know

33. Do you think that tuberculosis is a killing disease?

1. yes 2. No 3.Don't know

Registered by_____

Signature_____

Form 2: QUESTIONNAIRE FOR TUBERCULOSIS PATIENTS IN ADDIS ABABA

Department of community health, Addis Ababa University

(To be filled from the clinical record or by the attending health worker)

Name of health institution :_____

Patient's Name: _____ _____ Patient Code: |___|___|___|___|

1. What was the diagnosis?
   1. Pulmonary tuberculosis
   2. Extra-pulmonary (specify)_____

2. What was the result of sputum examination?
   1. Positive 2. Negative 3. Not done

3. In your opinion what was the condition of the patient at first diagnosis?
   1. Mild 2. Moderate 3. Severe/critical 4. Don't know

4. What was the result of the x-ray/radiological examination?
   1. Suggestive of tuberculosis
   2. Not suggestive of tuberculosis
   3. Not done
   4. Examination was done but **DON'T KNOW** the result

5. What was the result of tissue(lymp node/...) biopsy result?
   1. Suggestive of tuberculosis
   2. Not suggestive of tuberculosis
   3. Not done
   4. Examination was done but **DON'T KNOW** the result

Tuberculosis Patients Follow-up Sheet
Treatment Compliance Study
Department of Community Health, Addis Ababa University

1. Patient's code number: |___|___|___|___|

2. Patient's Name: _____

3. Sex: |___| Male |___| Female
4. Age: |___|___| years

First Month of Treatment

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29

Second Month of Treatment

DECLARATION

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in this or any other university and that all sources of materials used for this thesis have been duly acknowedged

Name Michaeal Taddesse, M.D.

Signature

Place ADDIS ABEBA

Date of submission 24/3/98

This thesis has been submitted for examination with my approval as the university advisor

Yemane Berhane, M.D.,MPH