

Delay in diagnosis and treatment under RNTCP, and Associated factors in district Bilaspur, Himachal Pradesh, 2008

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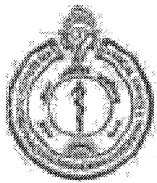
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(MAE-FETP Scholar 2007-2009)

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CERTIFICATION

This is to certify that all the field work submitted in this dissertation are original works carried out by **Dr. Satish Pundir** during the two field postings of six months each under guidance of faculty of national Institute of Epidemiology (ICMR), Chennai and the local supervisor specially nominated for this purpose. This is in partial fulfillment of the requirements for the degree of Master of Applied Epidemiology and has not been submitted earlier by him in part or whole for any other (publication or degree) purpose.

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Delay in diagnosis of Tuberculosis, Bilaspur District, Himachal Pradesh, India, 2008

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BACKGROUND: Early diagnosis and prompt treatment is the mainstay of tuberculosis (TB) control. Delay in diagnosis and treatment on one hand fails to prevent transmission of disease and on the other hand increases morbidity and mortality among those infected. Both patient and provider factors are responsible for delay in diagnosis. We conducted this study to estimate the delays in diagnosis of TB and factors responsible for such delays.

METHODS: We conducted a survey in Bilaspur district of Himachal Pradesh. We surveyed 140 new smear positive (NSP) cases diagnosed between 1st January to 30th June 2008, 41 doctors, all senior treatment supervisors, Senior Tuberculosis laboratory supervisors and 11 Laboratory technicians, to elicit information on factors responsible for delay in diagnosis of TB. Patient delay was defined as the no. of days in excess of 30 days between appearance of first symptom(s) and first medical consultation. System delay was defined as the interval between first consultation and initiation of treatment.

RESULTS: Fifty five percent of the surveyed patients contacted a provider within 30 days of the onset of first symptom. The First contact was a Government facility in 53% and non-governmental in 47% of the cases. The median delay was 62.5 days, (38 days patient delay & 29 days Health system delay). Patients who were smokers, or had a family size less than 3 members, or first contacted a non-governmental facility for diagnosis were more likely to have a delayed diagnosis.

CONCLUSION: The major portion (61%) of the median delay was contributed by patient factors. There is a need to educate communities about the importance of seeking medical consultation in the event of cough of more than three weeks duration.

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1. INTRODUCTION

Tuberculosis (TB) is one the leading causes of death due to a curable infectious disease¹ and was declared a global emergency by World Health Organization (WHO) in 1993.² In 2006, an estimated 9.2 million new TB cases (incidence: 139 per 100,000 population) including 4.1 million (incidence: 62 per 100, 000 population) new smear-positive cases, 14.4 million prevalent cases and 1.7 million deaths were reported by WHO.³ Africa and South-East Asia region, accounted for 83% of new cases in 2007.³

India is the highest burden country in the world contributing to nearly one fifth (21%) of all cases in the world. Annual incidence of TB cases in India is 1.9 million of which 0.8 million are sputum smear positive⁴. In 2007, TB prevalence and mortality was 299 and 28 per 100,000 populations.³

Himachal Pradesh has higher annual risk of TB infection (ARTI) of 1.9% against a national average of one percent.⁵ During the year 2007, 13,611 cases of TB were detected of whom 4,978 were sputum smear positive. NSP case detection rate was 81% and mortality rate 6.2/100000.⁶

In Bilaspur district, during the year 2007, 684 TB cases were detected of whom 293 were new sputum smear positive (NSP), with a case detection rate of 85% and a mortality rate of 6.7/ 100,000.⁶

Early diagnosis and prompt treatment is the key to TB control. Delay in diagnosis on one hand allows the transmission of infection for prolonged periods and on the other hand it increases risk of death by allowing progression to more severe disease. Every untreated

infectious patient of TB can infect 10-15 persons in a year. Therefore, longer the delay, the greater is the risk of transmission of infection and higher the incidence of TB.

Many factors have been documented to lead to delays in TB diagnosis. Delays may be on part of patient, health care provider and health system. Some of the reasons for patient delays have been linked to health seeking behavior, cultural beliefs, stigma, level of education, income, smoking habits, alcohol consumption, distance of the nearest health facility from patient's residence and knowledge and attitudes of the patients towards TB.⁷

On the other hand provider delays have been reported to be associated with knowledge of health care provider, dependence on radiography for making diagnosis of TB.⁸ Health system delay is reported to be associated with availability and quality of sputum microscopy.⁸

The extent of delay varies from one place to another depending upon social, cultural, economic and geographic factors. Even in developed countries like United States of America (USA) delays of as long as eight months have been documented.⁹ In another study conducted in Los Angeles, California, USA, there was more than 60 days delay in 20%, more than 30 days delay in 30% with an average delay of 74 days.¹⁰ A retrospective survey of 100 Ghanaian adults detected a median delay to diagnosis of 4 months (mean 7.7 months).

Studies in Tamil Nadu, southern India, have reported patient delay in seeking health care to range between 28 days to 2 months^{7, 11, 8} & have linked this behavior to their cultural practices, knowledge, beliefs and stigma.

Globally, DOTS (Directly observed treatment – short course) has proved to be the most successful strategy in tuberculosis control.¹² Therefore, Government of India adopted this

strategy under the revised national TB control programme (RNTCP), in 1998. This strategy was implemented in the state of Himachal Pradesh and district Bilaspur in the year 2001. In district Bilaspur, in the year 2007, case detection rate was 85%, cure rate 86% and mortality rate 6.7%. Therefore, district Bilaspur has succeeded in achieving the targets of case detection rate of 70% and a cure rate of 85% that are considered key indicators for programme performance. However, delay in diagnosis/treatment is not taken into account in any of the programme evaluation indicators. Therefore, TB surveillance data provides no information about delay in diagnosis. While several studies on delays in diagnosis and treatment have been conducted in other parts of the country no such studies have been carried in Himachal Pradesh and Bilaspur district. Since delay in diagnosis has major implications for TB control, in defying the principal strategy of early diagnosis and treatment, we undertook this study. (1) To estimate the delay in diagnosis of TB on part of patients, providers and health system among new sputum smear positive (NSP) tuberculosis patients (2) to determine the factors associated with such delays and (3) make recommendation based on these finding to reduce delay in diagnosis of TB.

2. METHODS

Bilaspur is one of the twelve districts in the state of Himachal Pradesh, with a population of 340,123 of which 94% is rural (Census 2001). The health facilities which deliver RNTCP/DOTS services include - one district hospital, one sub-district hospital, six community health centers, 25 primary health centers, two dispensaries, and 116 health sub-centers. Out of these institutions, two have been designated as TB units (at Bilaspur and Ghumarwin), 12 as designated microscopic centers (11 in government sector and one in private sector) and 222 as DOTS centers. Case detection rate and cure rate of TB cases in the district during the first quarter (1st January to 31st March) of 2008 was 88% each.

We conducted a cross sectional study between June and Nov 2008, in district Bilaspur and surveyed (1) all NSP cases diagnosed between 1st Jan 2008 and 30th June 2008 (2) all health facilities and (3) all health service/DOTS providers

We prepared a sampling frame of all target NSP cases, health facilities, health care and DOTS providers (Annexure-IX). We calculated sample size for each category of the study participants based on the case detection and cure rate of 88% each, an α - error of five percent and absolute precision of 2.5% making finite population corrections depending upon the size of each category in the sampling frame (Annexure-IX). We line listed the patients TU wise and interviewed 140 patients at DOT's centers and at their homes We made 3 attempts to search the patients. We recruited all the doctors working in Primary health center (28) Community Health Center (7) Civil Dispensary's (2) and interviewed all the medical officers depending upon the availability.

Patient delay was defined as the number of days in excess of 30 days between onset of the first symptom and first contact with a health facility. Provider delay was defined as the number of days in excess of seven days between the first contact with health facility and diagnosis of tuberculosis. We calculated total delay by summing up the patient and provider delays.

Based on literature survey several patient, providers and system related factors were identified .Details of these are listed in Annexure V. Patients who were continuing on DOTS were interviewed at the time of administration of DOTS and those who had completed DOTS were traced from the records of TB register and interviewed at their homes. Dates of diagnosis and initiation of treatment were collected from patient's treatment cards at treatment center.

We interviewed district TB officer, medical officers, and laboratory technician STS ,included in the sample using pre-tested semi-structured questionnaires (Annexures VI), abstracted information from records (TB register, sputum microscopy laboratory register, patient treatment cards and stock registers of the DOTS centers) by observation checklists..Health functionaries and DOTS providers were interviewed at their respective places of work.

All data were collected by the principle investigator. Double data entry was done using EpiInfo software for windows (version 3.5.1) to check data entry errors. We corrected data inconsistencies by referring to the original data collection instruments. We later analyzed the data using the same software. We calculated proportion (and 95% confidence interval) of patients who had delayed diagnosis. Means (\pm standard deviations) and medians (along with inter-quartile ranges) were calculated to express summary measures of delay in

diagnosis. We conducted a bi-variate analysis to look at the association of various risk factors studied with delays in diagnosis. We compared the proportions by a chi-square test and means by a t-test/Kruskal Wallis test. A p-value of ≤ 0.05 was taken as statistically significant.

Study was submitted and approved by the ethical committee of National Institute of Epidemiology.

Limitations of the study

NSP TB patients studied were registered for DOTS during the first two quarters of the year 2008 and may not be representative of the patients reporting in the whole year.

Recall bias: Patients may not have remembered the exact date(s) of onset of first symptom, first contact with a health care provider and treatments taken before the diagnosis. The patients were encouraged to relate the dates to important days like various festivals, national holidays or other important events in the patients' lives. In addition dates of diagnosis and treatment initiation were cross verified from the patient treatment cards.

3. Results

3.1 Profile of the study population

We surveyed 140 of the total 174 NSP TB cases registered between 1st January 2008 and 30th June 2008 at the two TB units of the district. We also surveyed 41 medical officers, 107 DOTS providers, 11 laboratory technicians, two senior treatment supervisors (STS) and two senior tuberculosis laboratory supervisors (STLS) and one district TB officer .

3.1.1 Demographic profile of the patients

Of the 140 patients surveyed, 129 (92%) were from rural area and 100 (72%) were males. The mean age was 40.7 yrs (s.d. \pm 17.2) median age 38 years (range 15 -93 years). Eighty eight percent were married, 81% from joint family, and 66% had family size of 3 to 7 persons. While 2% were Muslims, 98% were Hindus, of whom 55% were General category and 34% Scheduled caste, 9% other backward classes. Thirty two (22%) of the patients were illiterate. Household income ranged from Rs 500-38000 / month. Average household income was Rs. 6632 per month. About 23% of the patients were residing in Kuccha houses and 92% owned their houses. Approximately 40% of the patients were unemployed. Nearly 61% of the patients were smokers, of whom 46% were smoking for more than 5 years. Forty five percent of the patients were alcohol consumers.

3.1.2 Symptomatic profile of patients studied

Cough was present in 68% of the patients, fever in 80%, chest pain in 13%, hemoptysis in 11%, dyspnoea in 7.9% and history of weight loss in 6% (table 4 IX).

3.2 Patient Related delays

Three issues were estimated regarding patient related delays viz.(a) Interval between onset of symptoms of TB and first seeking help. (b) Delay associated with first seeking help (c) Factors associated with estimation in (b).

(a) Interval between onset of symptoms of TB and first seeking help

While 25% of the patients sought help within 10 days of onset of symptoms, 53% patients sought help within 30 days; another 25% patients sought care after two months. The median interval between onset of symptoms and first reporting to a health facility was 24.5 days (range 1-244 days), (inter-quartile range: 10-62 days) and mean interval was 48 days (SD± 8.6 days).

(b) Delay associated with first seeking help

Sixty six (47.1%) patients reported to the first health facility more than 30 days after the onset of first symptom. Mean delay was 60.9 (SD± 62.3 days and median delay was 38 days (inter-quartile range: 17-85 days; range: 1-214 days). *Thus more than half (52.9%) of the patients reported to the health facility on time (i.e. within 30 days of the onset of first symptom.* Of the 66 patients who delayed in reporting to health facility, delay ranged from 1-30 days in 29 (44%) of patients, 31-60 days among in 14 (21.2%), 61-90 days in eight (12.1%) and 91-180 days in another eight (12.1%). Seven (10.6%) of these 66 delayed beyond six months.

(c) Factors associated with patient delays

Several factors likely to be associated with the above delay were considered such as: age, sex, caste, patient's place of residence, marital status, type of family, size of family, family income, patients smoking and alcohol consuming habits, health facility contacted, distance between patient's residence and microscopy center, duration of cough. Each of these factors will be described below.

3.2.1 PATIENT RELATED FACTORS

Age

Majority (35%) of study NSP patients were aged between 15-29 years while those aged 60 years and above were only 16.4%. (See Table 2 Annexure IX)

With respect to interval between onset of symptoms and patients 1st seeking help of a health_facility, we observed that patients aged 30-44 and 60 years and above had a median interval of 24 days each. Patients aged 15-29 years had a median interval of 25 days and those aged 45-59 had median interval of 31 days. (see table 9 – Annexure IX)

Using the definition for delays, we observed that the proportion of delays among patients in the various age groups was 47% in 15-29 years, 45.5% in 30-44 years, 51.5% in 45-59 years and 43.5% in above 60 years. Maximum median delays (48.5 delays) were among those aged 60 years and above and the least delays (32 delays) among those aged 15-29 years. Median delay among patients in the age groups of 30-44 and 45-59 years ranged between 40 days and 36.5 days respectively. Except for patients in the age group of 30-44 years there appears to be an increase in the median delays with increasing age though this increase was not statistically significant ($\chi^2 = 0.00$ df :3 P < 0.9) (Table 16 – Annexure IX)

Sex

Approximately 71.4% of NSP patients were males (table 2 – Annexure IX). Males had higher median interval (29 days) between onset of symptoms and 1st seeking helps

compared to a median interval of 19 days among females. Proportion of males who delayed seeking help was 49% compared to 42% among females. median delays in males 40 days and in females 30 days was observed .Difference was not statistically significant ($\chi^2= 0.26$ df :1 P < 0.6).

Patients Place of Residence (Rural/Urban)

Majority (92%) of the study patients were from rural areas. Median interval between onset of symptoms and 1st contact with a health facility was observed to be 24 days among patients in rural areas compared to 60 days among patients residing in urban areas.

The delay in seeking help was 45.7% among patients living in rural areas compared to 63.7% among those living in urban areas. Median delays among rural patients was 33 days compared to 62 days among urban patients. However, these differences were not found to be statistically significant. (Table 16: - Annexure IX)

Religion and caste

98% of the NSP patients were Hindus and only 2% were Muslims. Fifty six percent were from general caste, 34 % scheduled caste and 9.4% from other backward classes. Nearly 51% patients from general caste, 44 % scheduled caste, 30% from other backward classes delayed more than one month However, these differences were not found to be statistically significant. (Table 16: - Annexure IX).

Marital Status:

Approximately 69.3% of the NSP study patients were married, 22% single and 8.6% widows/widowers. Among married patients, the median interval between onset of symptoms and 1st seeking help in a health facility was 23 days. In the case of unmarried and widowed patients the median interval was 32 days and 29 days respectively. (Table 8 : Annexure VI)

Delays were observed to be 44.3% among married, 54.8% among unmarried and 50% among widowed patients. Median delays among unmarried were 33 days, among married 38 days and 40 days among patients widowed. Difference was not statistically significant ($\chi^2= 1.08$. df :2 P 0.58).

Family Type:

Nearly 82% of the study patients were living in joint families. Median delays of 30.5 were observed among patients belonging to joint families as compared to 16.5 days among patients from nuclear families.

Delay was observed in 50% of patients from joint families compared to 34.6% among patients from nuclear families. Median delays however were longer among patients from joint families (39days) compared to patients from nuclear families (30 days) Difference was not statistically significant ($\chi^2= 1.44$. df :1 P 0.2).

Family Size:

Approximately 41.40% of patients had family size of 3-5 members. Only 9.3% had family size below three members; 25% had between 5-7 members while 24.30% family size was more than 7 members.

Median interval between onset of symptoms and 1st visit to a health facility was 69 days among patients with family size < 3 compared to 22 days among patients with family size above three.

Nearly 77% of patients with family size <3 members had delays whereas only 20.2 % of patients with Family size >3 members had delays. Median delays among patients with family size <3 members was 64.8 days compared to 34.8days for patients with family size >3 members. This difference was found to be statistically significant ($\chi^2= 39.37$ df :1 $P < 0.01$) (Table 15 : Annexure IX)

Education

Approximately 23% of patients were illiterate, 26% primary educated, 19% middle school educated, 21% up to matriculation and 12% graduates and above.

Highest median interval (30days) between onset of symptoms and 1st contact with a health facility was among graduates and least (3.5 days) among postgraduates. Median interval among illiterates was 20.5 days, followed by 22.5 days among primary school educated, 26.5 days among middle school educated and 31 days among matriculates. Median interval increases with increasing level of education.

Delay was observed among 40.6% of illiterates, 38.9% of primary school educated, 50% of middle school educated, 55.2% of matriculates, 66.7% graduates and 0% among postgraduates. Median delays observed was 41 days among illiterates, 49.5 days among primary , 40 days among middle, 19 days among matriculates and 35.5 days among graduates. This difference was not found to be statistically significant ($\chi^2= 2.86$ df :4 $P =0.09$) (Table 16 : Annexure IX)

Income

Nearly 8% of patients had monthly income < Rs.1500/- while 3% had incomes above Rs 20,000; 38.6% had income between Rs. 1500 – Rs. 4500 , 41% between Rs 4500 – Rs.10, 000 and 10% between Rs.10,000 – Rs. 20,000/-

Median interval between onset of symptoms and 1st contact with a health facility among patients with income < Rs 1500 was 50 days, 29 days among patients with income between Rs. 1500 - Rs. 4500, 25 days among patients with income between Rs.4500 – Rs.10,000 and 6days among patients with income between Rs 10,000 - Rs 20, 000/-.

Delays were observed in 54.5% patients with income <Rs 1500, 50% among patients with income between Rs 1500 – Rs 4500, 45.6 % patients with income between Rs. 4500 – Rs 10,000 and 22.4% of patients with income between Rs 10,000 –Rs 20,000/-. As income increases, the proportion of patients with delays decreases. Median delays however appears to be higher among patients with higher incomes. For example, mean delays among patients with income < Rs 1500 was 36.5 days compared to 39 days, 31.5 days and 102 days among patients with incomes between Rs 1500 – Rs 4500, Rs.4501 – Rs10,000, Rs 10,000 –Rs 20,000. This difference was not found to be statistically significant ($\chi^2= 0.940$ df :4 P = 0.3) (Table 16 : Annexure IX)

Smoking

Approximately 61% of patients were smokers. Median interval from the onset of symptoms and 1st seeking help in a health facility was higher (33 days) among smokers compared to non smokers (14 days). Higher proportion of smokers (55.3%) had delays compared to non smokers (35.5%). Likewise median delays among smokers were longer

(41 days) compared to non smokers (32 days). This difference was observed to be statistically significant ($\chi^2= 4.97$ df: 1 $P<0.01$) (Table 15 : Annexure IX)

Alcohol Consumption

Forty five percent of patients were alcohol consumers. Median interval from the onset of symptoms and 1st seeking help in a health facility was 31 days among consumers compared to 22 days among non consumers. Delays were observed among 51.8% of consumers compared to 45.2% among non consumers. Median delays among consumers was 45.5 days compared to 32.5 days among non consumers. This difference was not found to be statistically significant ($\chi^2= 0.38$ df:1 $P = 0.54$) (Table16 : Annexure IX)

Distance between patients residence and Microscope Center

While 34% of patients lived within 5 kms of the microscope center, 40 % lived 6-10 kms away, 23% lived at a distance of 11-20kms and 3.6% lived more than 20kms away from the microscope center

Interestingly median interval between the onset of symptoms and patient 1st seeking help at a health facility appears to decrease with increasing distance. For example median interval was 27 days among patients who lived within 5kms compared to 22days among patients who lived more than 20kms away.

Delays were observed among 46.8% of patients who lived within 5 kms, 48.2 % among patients living 6-10kms away, 46.9% of patients living 11-20kms and 40% among patients living more than 20 kms away from the microscope center. Median delays ranged from 41 days among patients living within 5kms to 109 days among patients

living more than 20kms. This difference not statistically significant $\chi^2 = 0.05$ df :3 P = 0.815) (Table 16 : Annexure IX)

Health Facility 1st Contacted

Although, majority (52%) of the patients had preference for private health facility, in practice majority (53%) had actually contacted a government facility for first consultation for symptoms of TB. Twenty nine percent of the patients studied had preference for a local pharmacy. Other details about the type of health facilities preferred and actually contacted are given in (table.2). Of the 65 patients who visited a private health facility for first symptom of TB (61%) contacted an unqualified practitioner and remaining 39% contacted a qualified (MD, MBBS, BAMS) practitioners. Proximity of the health facility to the place of patient's residence was the most common reason for contacting the first facility (58% respondents). This was followed by the patients' confidence in getting cured (30% respondents). Remaining patients had different other reasons to contact the first facility actually contacted (table 4 Annexure IX)

Median interval was 13 days when patient contacted Government facility, 37 days when contacted private facility and 60 days when contacted others (unqualified) especially chemists, traditional healers, quacks was associated with long median interval.

All patients who did self medication delayed more than 6 months. Thirty two percent patients who contacted Government, 61% who contacted Private health facility reported after one month. Patients who contacted Govt. facility (4%), private facility (5.6%) reported after six months.

68.9% patients who contacted unqualified private providers as first health facility had significantly high delay ($\chi^2 = 15.2$ df : 2 $P < 0.001$) with median delay of 43 days while 61.1% patients who contacted Private facility and 32 % patients who contacted Government health facilities had median delay of 31 day.

Duration of cough

Nearly 66% of study patients had cough for more than three weeks. Median interval between onset of symptoms and patient 1st seeking help in a health facility among patients with cough more than 3 weeks was nearly twice (32 days) that observed for patients with cough less than three weeks (17 days).

54.3% of patients with cough >3weeks had significantly higher delay ($X^2 = 5.59$ df: 1, $P < 0.01$) with median delay of 42 days while 33.3 % patients with cough < 3 weeks had median delay of 19 days.

Tuberculosis knowledge of patients studied

Ninety seven percent patients had heard of tuberculosis before his/her diagnosis of TB, 80% knew that TB is not a hereditary disease, 91% knew about communicable nature of TB and except for one patient all new about the correct duration of treatment of TB.

Most (81%) did not know about the causation of tuberculosis. Sixteen percent of the patients attributed it to smoking/alcohol abuse, 10% to fate, eight percent to worries, four percent to poor diet, three percent to overwork, two percent to God's curse, and another one percent attributed it to poor hygiene. Thirty eight percent of the patients did not mention any cause of the disease. Only 19% of the patients knew that TB was caused by infection with some germs. (table.3 Annexure IX)

Television was the most common source of knowledge about TB (39% of participants). Only 12% of the patients had gained TB knowledge from sources of the health department (table.3 Annexure IX)

Referral patterns

Majority (54 %) of the patients visited the diagnosing health facility on their own, 24% were referred by previous health provider and 16 % were advised by their family members to visit the health facility that made the final diagnosis of TB. A negligible 2% (three) of the patients were referred to microscopy center by the health workers of health sub-centers.(table 6 Annexure IX)

Stigma

About 2/3rd (68%) of the patients felt that the TB affects existing marital relations. Nearly 59% felt that TB affects their work performance, 29 % were ashamed of having TB, 23 % felt that TB patients have poor matrimonial prospectuses and affects family responsibilities, 7% felt that TB affects family relations.

With reference to maternal and child health issues, 38 % of the patients felt that women suffering from TB should not breastfeed and 24 % of the patients felt that TB leads to complications during pregnancy.

On a Likert scale (minimum 0; maximum 28), a mean stigma score of 19.5 (median 20; IQ range:17-22; range:3-28) shows a high level of stigma among TB patients studied.

Stigma was not associated with delay

Perceived delays

One fifth of patients ascribed the delay to poor knowledge of the disease and about 12% thought that the symptoms would disappear on its own. Seventeen percent patients did not perceive any delay. Other reasons perceived by patients are given in (table.3 Annexure IX)

The patient delay was not significantly associated with age, sex, caste, literacy, patient's knowledge of TB, income, occupation, type of house, consumption of alcohol or distance of microscopy center from the residence of the patient.

In multivariate analysis patient delay was significantly associated with literacy (OR,0.61, 95%CI.0.43-0.86) urban area (OR:0.16,95% CI 0.03-0.78 P value <0.02), Health facility first contacted(OR 0.358,95% CI 0.21-0.59 P value < 0.001).

3.3 PROVIDERS –RELATED DELAYS

3.3.1 Providers Profile

3.3.1.1 DOTS PROVIDERS

We interviewed DOTS providers, MO PHI & DMC's, STS, STLS, MOTC and DTO to access the system issues regarding delays in diagnosis and treatment of NSP patients.

Of 107 DOTS providers 94% were in the rural area, 46% were males. Most (98%) were in service for more than 5 years, 94% were trained in RNTCP, and 82% had correct knowledge of case definition. According to 60% DOTS providers delay in diagnosis among TB patients is a problem.

3.3.1.2 MEDICAL OFFICERS PRIMARY HEALTH CENTERS (MO PHC's)

Majority of (78%) of MO's were male, 72% were trained in RNTCP and had correct knowledge of case definition of suspect cases. About 94% of PHC's were getting regular supply of drugs and logistics. Six (24%) of PHC's were without a medical officer.

3.3.1.3 MO DESIGNATED MICROSCOPY CENTERS (DMCs)

Of the 12 DMC's, one (8%) DMC is without medical officer. Majority (69%) of them lacked sufficient experience (total service of less than one year). All were males, trained in RNTCP, 91% percent knew the correct TB case definition, and 73% knew the number and dosage of medicines given to the patient in intensive and continuous phase of

treatment and follow-up schedule. According to 91 % of MO DMC diagnostic delay is problem and it is more than 30 days on an average.

3.3.1.4 LAB TECHNICIAN

Out of 12 DMC's one DMC is not having lab technician for three months, rest all are trained in RNTCP getting regular supply of sputum cups , slides and reagents, Only one DMC is having smear positivity rate of 10% or more .

3.3.2 Providers Related Delays

We estimated 2 types of provider's delays viz. (a) delays associated with diagnosis and (b) delays associated with initiation of treatment. We also identified factors associated with each of the above types of delays.

(a) Delays associated with Diagnosis

Provider's delay of more than 7 days was observed among 89 (63%) patients; median delay was 29 days, (range 1-343days) (Mean 50.9 days SD± 59.9). Of 140 patients 32(23%) were diagnosed at their first contact, 22 (15%) at second contact and 18(13%) at third contact. 68(49%) had to contact the providers on more than three occasions before diagnosis. Sputum was not examined in 80 % of the patients in prior consultations. Radiographic examination was done in 30 % of the patients before diagnosis of tuberculosis. Thus the system could diagnose just above one third (36.4) of the patients on time (i.e. within seven days after reporting to the facility). However the mean and median delay was shorter for the system factors as compared to the patient factors

(b) Factors associated with providers delay

In univariate analysis providers delay was significantly associated with First contact of patients with primary health center, number of consultations, failure to perform sputum

microscopy. Patients factors also contributed in providers delay and factors significantly associated were females, other castes, non salaried class, size of family less than 3, smoking habits. These will be described in detail

Health facility first contacted

54% of patients first contacted Government health facility, 26% contacted private health facility, 20% contacted others (unqualified) providers , 14 % among others were drug stores. Of 75 patients who contacted Government facility 24 % contacted district level ,17% sub-district level, 12% community health center level, 20 % Primary health center ,5% each civil dispensary & sub-center level and 16% indigenous system of medicine.(table 4)

93% of the patients who contacted Primary health center as first facility had significantly higher delay (χ^2 ; 5.06 df: 1 P value< 0.02) with median delay of 33 days while 60 % patients who contacted institution other than PHC such as district, sub-district CHC and civil dispensary had shorter delay with median delay of 27 days.

In multivariate analysis providers delay was significantly associated with health facility first contacted (OR, 1.686, 95% CI1.0-2.82).

Number of consultations

23 % patients consulted once before diagnosis of TB, 28% consulted 2-3 times, 34 % consulted 4-6 times and numbers of consultations were more than 7 in 15 %.(table 6)

66% patients with consultations > 7 had higher delay (χ^2 ; 6.6 df: 3 P value< 0.05) with median delay of 49 days while 34% with one consultations had shorter delays with median delay 49 days this was statistically significant. Although median delay was 49 days in each of the category but patients with more number of consultations had higher (66%) proportion of patients getting delayed in diagnosis.

Sputum examination

Sputum was examined only in 20 % of patients prior to diagnostic specimen. Sixty eight percent of patients whose sputum examination was not done prior to diagnosis had significantly higher delays (χ^2 ; 4.31 df: 1 P value 0.05) with median delay of 33 days while 44% patient whose sputum examination was done prior to diagnosis had shorter delay with median delay of 19 days.

Patient's factors contributed providers delays are discussed below.

Smoking

About 74% of non smokers had higher delay (χ^2 ; 3.96 df :1 P value <0.04) with median delay of 40 days whereas 56% smokers had shorter delay with median delay of 26 days

Gender

77 % females had higher providers delay (χ^2 ; 3.89 df 1, P value <0.03) with median delay of 40 days while 58% males had shorter delay with median delay of 27 days, 48% females and 53 % males delayed more than 1 month, 6.5% females and 3.4% males delayed more than 6 months

Caste

55% of 140 patients were from general caste, 34% were scheduled caste, 9% were from other backward classes and 2 % from other classes, 73% patients from others castes had higher providers delay (χ^2 ; 3.70 df: 1 P value < 0.05) with median providers delay of 28 days while 55.8% from general caste had shorter delay with median delay of 28 days. 66% patients from muslim family delayed more than 1 month & 2.3% delayed more than 6 months. 53 % patients from scheduled caste delayed more than 1 month and 9.4% delayed more than 6 months. 45% from backward classes delayed more than 1 month.

Occupation

40 % Of 140 patients were from non salaried class. This was significantly associated with providers delay. About 78.5% of non-salaried patients had higher delays (χ^2 : 8.02; df: 1; P

value < 0.002) with median delay of 27 days while 53.5% of salaried class had median delay of 33 days. Nearly 58% from non salaried class 45% from salaried class delayed more than 1 month. 4 % from both classes delayed more than 6 months.

Family Size

Ninety four percent patients from family size of <3 members had higher provider delay (χ^2 ;56.3, df :1, P value 0.001) with median delay of 32 days while 32 % patients from family size > 3 had shorter delay with median delay of 24 days.

Age

Providers delay increased with increase in age, 50% patients from age group < 30 years delayed more than 1 month .12.5% from age group > 60 delayed more than 6 months with median delay 29 days.

Patients place of residence (Rural / Urban)

51 % from rural area with median delay 32 days and 17% from urban area with median delay 13 days delayed more than 1 month .Only 4% patients from rural area delayed more than 6 months.

Literacy

59 % illiterates with median delay 38 days and 45% literates with median delay 27 days, delayed more than 1 month and 12 % illiterate and 8% literates delayed more than 6 months with median delay

Marital status

There is no difference in delay and median delay among married and unmarried patients.

Income

Median delay increased as income increased minimum delay of 28 days in income group less than 5000 and median delay of 58 days in income group more than 10000 was observed.

Type of family

48 % from joint family with median delay 27 days and 53% from nuclear family with median delay 40 days , delayed more than 1 month.

Alcohol consumption

45% alcoholics with median delay 24 days and 30% non alcoholics with median delay 35 days delayed more than 1 month, 5.7% alcoholic and 3.7% nonalcoholic delayed more than 6 months.

Distance between residence and microscopy center

33% patients delayed more than 1 month when distance between residence and microscopy center was less than 5 kms. with median delay of 30 days while 45 % patient delayed more than 1 month with median delay 37 days when distance between residence and microscopy center was >20 kms.

3.4 Delays Associated with Treatment delay

Among 94 out of 140 patients median time interval from diagnosis of TB to the initiation of treatment was 2 days,(range 1-21 days), (mean 3.5 SD±3.9). In 131(93%) patients treatment was initiated within 7 days while the rest 9(6.4%) patients delayed treatment.

3.4.1 System Issues

Funds allocated for RNTCP were 1.9% of the total for district Bilaspur, IEC activities were conducted by DOTS providers and supervisory staff of DTC. There is no shortage of anti TB drugs and logistics in the district. There is shortage of manpower in the district only one MOTU is in place out of 2. Six PHC's out of 25 and one DMC of 12 were without medical officers. One DMC is without laboratory technician. Nineteen percent of the posts of MPW's are vacant. Ten sub-centers are without any worker.

3.5 Total delay

Diagnosis was delayed in all patients although the duration ranged from two days to about one year (355 days). Median total delay was 62.5 days (inter-quartile range: 34.5-110 days)

4 DISCUSSION

In this study, among the 140 smear positive pulmonary tuberculosis patients interviewed, almost 58% cases were found belonged to economically productive age group of 15 – 45 years, comprising 35% by the age group of 15 – 29 years only. This kind of figure is very similar to entire developing world.^{13, 14, 15}

68% of the patients had cough as presenting symptoms this is comparable with other studies in South India,⁷ Ethiopia,¹⁶ Mwanza, Tanzania¹⁷, Botswana,¹⁸ and Canada.¹⁹

4.1 Patient delay In our study, 47% of the patients waited for their first consultation for more than 30 days. Median patient interval was 24.5 days (range 1-244 days). Median patient delay was 38 days (range: 1-214 days) In Studies conducted in south India with similar cut-off of 30 days, patient delay of 20, 21 days in Rajeswari R7 et al (pre RNTCP era) and Jerard.M et, al's¹¹ (RNTCP era) was observed respectively. Patient delay of 21 days was observed in Karma Jigme Tobgay study in Sikkim²⁰. Though Sikkim and Himachal have similar geographical conditions but delays were longer (38 days) in Himachal Pradesh. A study conducted in Nepal observed 27 days patient delay²¹. Number of studies conducted in different settings had reported longer patient delay than that of health system delay like in Mwanaza, Tanzania (136 days vs.15 days)¹⁷, Ethiopia (60 days vs. 6 days),¹⁶ east London (9 weeks vs. 5 weeks),²² and rural South Africa (4 weeks vs. 1 week).²³ Studies in Botswana¹⁸, Vietnam,²⁴ showed median patient delay of 3 weeks.

Main determinants for patient delay in our study which were statistically significant were smoking, family size less than 3, duration of cough and Health facility first contacted,

main factors responsible for provider delay were failure to perform sputum microscopy, First contact with Primary health centers , females , other castes, non salaried, size of family less than 3 members, non-smokers.

Patient's delay was longer in family size less than three and was statistically significant. Patient in small size family may be lone earner and could not visit health facility. A study conducted in South Africa household size was associated with longer patient as well as service provider delay.²³

Median patient's delay was longer in smokers (41days) than non-smokers and it was statistically significant. A study conducted in Tamilnadu showed smoking is the risk factor for patients delay¹¹.Median patient delay was longer among alcohol consumers than in non consumers. Consumption of alcohol was associated with longer delays in Rajeswari R et.al.⁷ and Jerard.M study¹¹. In the Philippines, patients linked symptoms of tuberculosis to alcohol/tobacco and, thus, delayed seeking treatment for these "harmless" symptoms²⁵.

Cough more than 3 weeks was associated with patient delay, this was statistically significant. Patient with longer duration of cough may link cough to be associated with other lung diseases like COPD, allergic bronchitis more prevalent in Himachal Pradesh.

Longer patient delay (43 days) was observed in patients who consulted non-government health facilities, especially chemists, RMP, traditional healers. According to a study conducted by Uplekar M. 86% of the patients approach private practioners in India²⁶.

Though not statistically significant but were associated with patient delay are age, sex, literacy, place of residence, income, occupation, type of family, type of house,distance to

microscopy center . Median patient delay was longer (43 days) among patients with age more than 45 years. Similar findings were found in Sikkim²⁰,South India⁷ studies. According to study conducted in China elderly patients were more reluctant to seek health care²⁷ therefore risk factor for delay.

Median patient delay (40 days) was longer among males. Similar findings were demonstrated in study conducted by Rajeswari R et,al.⁷ In Hooi study delay was found to be longer in males²⁸. In contrast patient delay was longer in females in Jerard.M¹¹ and study in Orissa²⁹. In Orissa Fifteen percent of women took no action when having symptoms as compared to eight percent of men. . In contrast to this study patient delay was longer in Vietnam³⁰, Malaysia³¹ and Bangladesh³² among females.

Median patient delay was longer (40 days) among general class than others castes.

Patients delay was longer among literates. . Delay was longer among illiterates in South Indian study.⁷ In contrast to our study delay was longer in patients with less than secondary level of education in Hooi²⁸ study in Malaysia. Patient delay among literate is high, this may be because literate may not think of suffering from TB.

Patient delay is longer in urban area (62 days). Uplekar M et al.²⁶ observed delay of 3 weeks in urban and 2 weeks in rural area. Patient delay was longer in low income groups (36 days) and non salaried class (30 days) Longer (38 days) patient delay was found in unmarried patients and patients from joint family (39days).

This study found no role of knowledge in delayed care seeking for TB. However 81% patients did not know about causation of tuberculosis. Knowledge as an independent

variable was found causing significant delay in seeking TB care in Ethiopia,¹⁶ whereas it was completely rejected in Lusaka.³³

There was high level of stigma among patients but stigma was not significantly associated with delays, similar findings were found in Lusaka.³³ Several studies in different socio-cultural context, such as in Vietnam,^{34, 35, 36, 37} Botswana,¹⁸ Cali, Colombia,³⁸ and Sialkot, Pakistan³⁹ have come up with evidence that stigma is closely attached with TB, and resulted into delayed seeking of health care.

There was no association between delay and perceived causes of delay. Similar findings were found in studies conducted in Philippines.⁴⁰ Lusaka,⁵⁹ where the patients' perception about the health services was found greatly associated with delay, poor perception of patients about the cause and severity of diseases, and its economic, health and social impacts was found significantly associated with longer delay⁴¹.

4.2 Providers Delay

Median provider/health system delay was 29 days, range: 1-343 day (I.Q. range 11.0-68.0) in establishment of diagnosis after first contact with health facility. Median total delay was 62.5 days (range: 2-355). Majority (63%) of patients were diagnosed more than seven days after first consultation with the service provider.

A study done in south India with similar cut-off of 7 days had 69% provider's delays.⁷ Median providers and total delays were 23, 60 days respectively in Rajeswari R⁷ et.al's, 28 and 62days in Jerard.M et.al's studies¹¹, 7 and 32 days in Karma Jigme Tobgay study in Sikkim²⁰ Providers delay was only 7 days in Sikkim whereas it is 29 days in our study. Other studies Botswana¹⁸, Vietnam³⁷ showed Providers delay 5 and 7 weeks, Total delay 12 and 9.9 weeks respectively.

Longer delays (33 days) were significantly associated with first contact of patients with primary health center level. Delays may be because lack of sputum microscopy at this level of Government facilities, and lack of diagnostic suspicion among doctors.

Other factor responsible for providers delay was failure of health facility to perform sputum microscopy examination and it was statistically significant. Median delays were 33 days (I.Q. 12-80 days). According to study conducted in Ghana delays to diagnosis of 4 months was observed and was associated with failure to perform sputum microscopy.⁴²

Providers delay was longer among females and was statistically significant. Similar findings were demonstrated in study conducted by Rajeswari R et,al .⁷ Provider's delay was significantly longer in females in Ghana⁴², Vietnam,³⁷ and Queensland,⁴³

Provider delay was longer among others than general class and is statistically significant. Providers delays were longer among non-salaried class, family size less than three and were statistically significant. Patient in small size family may be lone earner and could not visit health facility. A study conducted in South Africa household size was associated with longer service provider delay²³.

Distance to microscopy center of > 5 Km was associated with longer provider's (35 days) delay though not statistically significant. A similar study conducted in South India showed distance to be risk factor associated with providers delay,^{7, 11}

Providers delay was longer (35 days) in patient who approached Government hospitals though not statistically significant. Longer providers delay may be because of lack of

Government doctor's suspicion of tuberculosis or poor laboratory sensitivity in detecting TB.

Sputum positivity of 10% was found in only one designated microscopy center (DMC) of district Bilaspur out of 12 DMCs'. According to study in South India and Sikkim provider delay was greater when the patient's first contact was with the private sector. A quarter of patients were not diagnosed even after two actions.

The median provider delay when a patient consulted a government provider first was 9 days, compared to 50 days for those consulting a private provider or indigenous (non-allopathic) system first.¹¹

In this study it was found that age more than 45 years was associated with system delay. Similar findings were found in Sikkim²⁰, South India⁷. Providers delay was longer among illiterates this may be because they do not understand the importance of sputum examination and not aware of free Government services.

Providers delay was longer in rural area though not statistically significant. Uplekar M et al.⁴⁴ observed delay of 3 weeks in urban and 2 weeks in rural area. High Providers delay in rural area may be due to difficulty in accessing microscopy centers in rural areas. According to Ghanian⁴³ study providers delay was significantly greater in females, rural patients.

Longer providers delay was associated with non smokers it was statistically significant. Median providers delay was longer among non-alcoholics. Alcoholic were diagnosed earlier Alcohol consumption was risk factor associated with providers delay in study conducted in South India⁷.

5 CONCLUSIONS

More than half 74/140 (53%) of the patients report to health facility on time (within 30 days of the onset of symptoms). Median patient delays are longer (38 days) as compared to other studies. Only about one third of the patients are diagnosed by the system on time (within seven days of reporting to health facility).

Smoking, sizes of family, duration of cough, contact with the traditional healers, RMP, chemists are the main risk factors for patient delays.

Failure to perform sputum examination, first contact to PHC level, males, others castes, salaried classes, family size less than three, smoking are the factors responsible for provider delays.

Sputum positivity rate are less than programme target of 10% in more than 90% of the microscopy centers.

6 RECOMMENDATIONS

Educate the masses about the importance of seeking health care in case of cough of more than three weeks duration because 80 % of the patient were not aware of cause of tuberculosis in Bilaspur.

This study provided us the information about the delay in diagnosis and treatment in Bilaspur district of Himachal Pradesh. Information can be used to improve case detection and treatment of TB patients to reduce transmission of infection, morbidity and mortality associated with TB. One area of vital importance in reducing delay among TB patients is

increasing awareness in the general population regarding symptoms and signs of tuberculosis and availability of free services in Government health facility. Encouraging them to self referral to health services is crucial to increase passive case detection. Government health providers should be trained or retrained , because longer providers delay was observed with the patients who first reported to them. Early referral for sputum examination is required from them to reduce delay. Also redistribution of microscopy centers is required because distance was observed as risk factor associated with providers delay , quite a large number of the patient had to travel a lot for microscopy examination. DMC's should be strengthened by training / retraining and supervision of the lab. technicians because most of the DMC's could not achieve the target of ten percent positivity among chest symptomatics. Involvement of private practioners in RNTCP. Sensitizations of traditional healers, RMP's, Chemists for early referral of chest symptomatic or engaging them as DOT's provider.

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ANNEXURE I

LITERATURE REVIEW DELAY IN DIAGNOSIS & TREATMENT IN

TB

Mycobacterium tuberculosis has been present in the human population since antiquity - fragments of the spinal column from Egyptian mummies from 2400 BCE show definite pathological signs of tubercular decay¹. The disease tuberculosis, commonly referred to as TB, has been affecting human beings since before the time of the ancient Egyptians. The most common name for tuberculosis came from Dr. Silvius, known better as Franciscus de la Boe, because of the tubercles found in infected patients. Due in part to its widespread nature, TB has been known by many different names.² It has been 125 years since Robert Koch first discovered the tuberculosis bacilli and the world is still fighting hard to control this deadly but easily curable disease. The poor and developing countries are still in the grip of TB despite the courageous efforts of Dr. Koch and generations of his successors.

One third of the world's population is estimated to be infected. Globally World Health Organization (WHO)³ estimated 8.8 million new TB cases, 14.1 million prevalent cases (217/100000) and estimated 1.6 million (24/ 100000) deaths from TB in 2005 including 19500 co infected with HIV. In 2005 South-East Asia region, accounted for 38% of new cases and 290 per 100000 prevalent cases with a mortality of 31 per 100000 to the global burden. In India prevalence of tuberculosis is still high with 1.8 million cases occurring every year of which 0.8 million are sputum smear positive. There are 219 per100000 prevalent cases with high mortality rate of 28 /100000.³ Several obstacles impede the

expansion of the RNTCP.⁴ First, diagnosis and treatment are uncoordinated and inconsistent because many patients initially receive care through the large private health-care sector, pharmacies often sell anti-TB drugs over-the-counter, and TB notification requirements are not strictly enforced. Second, poverty impedes program performance. Many areas lack regular electric supply, limiting the effectiveness of binocular microscopy. Economic hardships and drought cause large-scale migration, reducing treatment completion and cure rates. Third, a patient-centred approach to care—one that actively helps patients by providing them with transportation to health facilities, food, and social support to overcome obstacles to completion of treatment—is not practiced widely in India⁵.

Case-finding in patients attending health facilities is an essential component of the control of tuberculosis. Its objective is to identify the sources of infection in the community, that is, individuals who are discharging large numbers of tubercle bacilli. Treatment of those infectious patients rapidly renders them noninfectious, thereby cutting the chain of transmission. A secondary benefit of case detection is to minimize the delay in initiating treatment, thereby increasing the probability of cure⁶. If the cases detected cannot be treated effectively – because of lack of drugs, poor organization, or patients' limited access to treatment services the activity is of little value. Identification of cases without being able to treat them undermines confidence in the health system and increases the number of persistently infectious cases spreading drug-resistant bacilli. Where new cases are not yet treated satisfactorily and reliably cured, resources and efforts should therefore be concentrated on improving treatment outcomes rather than increasing case detection.⁷ In addition to patients consulting for symptoms, the main

target group for case detection is persons who attend health facilities for any reason and present persistent cough, i.e. cough of more than 2 or 3 weeks' duration.

Every untreated infectious patient of TB can infect 10-15 other persons in a year.⁸ Pulmonary tuberculosis continues to increase due to late patient presentation. Delay in diagnosis on one hand accelerates the transmission and prevalence of the disease; on the other hand it increases the risk of death by increasing the severity of disease.⁹ Regardless of cause, delayed diagnosis and treatment can be catastrophic to those exposed to infected patients¹⁰. Delayed diagnosis causes patients to have more advanced disease, more complications and a higher mortality hitting families in the developing world the hardest, particularly because younger active wage-earners are the chief victims of the disease. Diagnostic delay has even greater implications for the millions of patients with pulmonary tuberculosis and co-infection with human immunodeficiency virus (HIV).¹¹ Delays in diagnosis and treatment increases morbidity and mortality from TB as well as the risk of transmission in the community^{12, 13}. Undiagnosed tuberculosis cases are the reservoir for transmission of infection. Delays in diagnosis of tuberculosis have been reported in both industrialized and developing countries and vary considerably from 6.2 weeks in Australia¹⁴ to 12 weeks in Botswana¹⁵. and 16 weeks in Ghana¹⁶. Studies of Latinos in Orange County and Texas found average delays in seeking care of more than 8 months¹⁷. Another study conducted at Los Angeles, California shows that there is more than 60 days delay in 20%, more than 30 days delay in 30% with an average delay of 74 days¹⁸.

Under the DOTS strategy case finding is limited to passive surveillance of chest symptomatic. The term "passive case finding" is used here to describe methods for

identification of tuberculosis cases where the first initiative for an individual patient/provider contact is taken by the patient. In spite of high burden in the community there appears to be considerable delay in their identification¹⁹. Prolonged self-treatment, consultation with the traditional health sector and social stigma are some of the factors associated with increased patient delay²⁰. Strategies aiming to reduce the time between the onset of symptoms and the initiation of effective chemotherapy may impact the infectious duration in the community and thereby reduce the number of new infections.

Patient Delay

Most patients are found to shop around²¹, from one facility to another, prior to completion of the diagnostic process. At many of such facilities, including some of the governmental ones, which the patient may be visiting, appropriate services for diagnosis and treatment may not be in place. Whereas, from a few of the studies carried out in India²², it is possible to formulate a hypothesis on a patient's search for relief, the actual situation could be different from area to area, related possibly to the socio-economic state of the people and depending on the efficiency of the tuberculosis programme, being run in the given area. It has to be, in any case, a priority concern for a peripheral level programme manager, as for example the District TB Officer (DTO) in India, to understand the mechanism of delay in diagnosis of tuberculosis patients, so that he could take corrective actions.

Patient seek medical care when their symptoms are subjectively sufficiently severe (interruption of normal activities, costs). There are different forces that influences a patient's delay from the first occurrence of symptoms to the seeking of medical attention. A study conducted in Ethiopia 35.6% of patients reported first to drug shops, private clinics or private hospitals upon recognition of symptom, 43% patients reported first to either health centers or government hospitals²³. According to study conducted in Sarawak Malaysia Based on cumulative distribution, 42.7% of the respondents consulted a medical worker more than 30 days from the onset of TB symptoms. The longest delay was reported to be one year.

Age.

A recent Indian study has shown that patients aged 45 years or above are likely to have longer patient delays²⁴. According to study conducted in China elderly patients were perceived to be more reluctant to seek health care²⁵

Gender

Overall prevalence of pulmonary TB is lower in women, progression from infection to disease is as much as 130% higher in women between the ages of 10 and 44 years, and

case fatality rates are 27-41% higher in women and girls between 5 and 24 years of age²⁶. These numbers indicate that, while women may enjoy some kind of natural protection against TB, it may be offset by biological and sociological vulnerabilities at certain life stages. This may lead to accelerated morbidity and mortality, as well as delays in treatment-seeking and/ or differential treatment once they seek help from the health care system. Gender itself is not the cause of morbidity and mortality in TB but is a powerful indicator of disadvantage, a marker of many factors that influence health and utilisation of health services. Health seeking behaviour of people, especially of women, may be influenced by stigma, by making them reluctant to get their sputa examined and shop for diagnosis and treatment, often in places away from their residence²⁷. A study conducted in Sarawak Malaysia found that gender was significantly associated with patient delay, because women depended on male family members to take them for treatment²⁸.

Gender inequalities can lead to poorer access to health care and delays to diagnosis of tuberculosis in women. In a population-based survey that assessed health-seeking behavior in adults with long-term cough, women took more health care actions than men, but chose less qualified providers and reported lower health expenditure per visit. Delay before seeking hospital treatment was longer for women (41 days) than men (19 days; $p=0.04$), and more men (27, 36%) than women (14, 14%; $p=0.0006$) reported giving a sputum sample at hospital²⁹. Delays in diagnosis were also more evident in women than men. A study in Vietnam has shown that women with pulmonary tuberculosis are diagnosed on average 2 weeks later than men because of delays from the healthcare provider³⁰. Similarly, a study in Nepal showed that women were diagnosed a month later than men.^{31 32}

In Hooi study delay was found to be longer in males, those with lower than secondary level of education and drug users³³. According to study conducted in Tamilnadu India in 2003, delay was not associated with sex, age, literacy, occupational status or the type of provider consulted but patient's delay was associated with smoking (aOR 1.9, 95%CI 1.3–2.6) and mode of transport (aOR 2.0, 95%CI 1.3–3.1)³⁴.

Household size. A study conducted in South Africa reported household size was associated with longer patient as well as service provider delay.³⁵

Occupational status. The findings by Wang *et al.*³⁶ suggest that immigrant status in the Shanghai context does not only imply lower income and lack of insurance, but also fear of losing one's job if the employer finds out about the disease.

Knowledge

Good general lay knowledge of TB is important for both health care seeking and adherence to treatment. Studies from Malaysia³⁷, China²⁴ and Vietnam have shown that treatment is often delayed due to poor knowledge, particularly in lower socioeconomic groups. Many in these groups are not aware of the risks associated with long-standing cough, they are not reached by national programmers and they do not recognize the need for prompt case detection, follow-up and treatment.

Stigma

Studies have shown that patients hesitate to disclose their symptoms or disease to others like family members, friends, community, out of fear of being socially ostracized. A study conducted in Mumbai indicated that women with tuberculosis were worried about rejection by husband, harassment by in-laws, dismissal from work, reduced chances of marriage for unmarried women, and difficulty in keeping the condition a secret, married women delayed seeking treatment or hide their diagnosis from their husbands out of fear of being deserted.³⁸ (77%) Vietnamese refugees in New York believed that the community would fear and avoid persons with TB³⁹. In Thailand, community's strong belief about TB transmission through eating and drinking seemed to have induced anxiety and stigma among female HIV negative TB patients; these women were not allowed to join social events when people came to know that they had tuberculosis⁴⁰. In Colombia, stigma, poor service quality and culture-based explanation are found to act as strong barriers to early diagnosis⁴¹. Similarly, in Mexico, patients blamed social consequences of stigma for their long delays in seeking care and poor treatment adherence⁴². In Honduras too, fear of losing family and friends led some TB patients to report preferring death to social rejection⁴³. Various studies in India have reported patient delay in seeking health care in the range of 28 days to 2 months,²⁴ & have linked this behavior to their cultural practices, knowledge, beliefs and stigma.

Cultural beliefs

Cultural beliefs about the causes of TB may also influence how people treat their symptoms.

In Ethiopia, TB and all other diseases are believed to be caused by imbalances in behaviors or diet and are, therefore, best treated by herbal remedies and “good” foods⁴⁴. In the Philippines, patients linked TB to alcohol/tobacco and, thus, delayed seeking treatment for these “harmless” symptoms⁴⁵. A study conducted in South Africa found that there was a strong belief in the community that tuberculosis was the result of breaking cultural rules that demand abstinence from sex after the death of a family member and after a woman has a spontaneous abortion. People believed that traditional healers could only treat the resulting disease. Only when traditional treatment failed did they seek western medicine⁴⁶.

Traditional treatment

A study conducted in Nepal⁴⁷, Malawi⁴⁸ and, Africa⁴⁵ found an initial visit to a traditional healer to be a significant risk factor for patient delay

In Kenya, traditional treatment is considered an alternative to modern treatment. Initial symptoms such as cough and fever are often overlooked and/or confused with malaria or common cold. Prolonged self-treatment, consultation with the traditional health sector and social stigma are some of the factors associated with increased patient delay. The role of the traditional healer in the control tuberculosis has to be seen in the

light of the fact that they have other socio-cultural and religious externalities, which may be beneficial to the communities concerned. Most tuberculosis programme interventions targeted towards traditional healers in the state seem to be in the form of I.E.C. (information, education and communication) materials that discourage the use of traditional healers, while numerous models from high burden countries show that they can be utilized in a more productive manner in tuberculosis control ⁴⁹,The World Bank too reported that traditional healers could be important potential public health providers of essential clinical services if governments give them appropriate training, information and incentives⁵⁰.

Access

In industrialized countries with dense network for health provision, the distance between residence or workplace and health-care facilities may be an unimportant factor in a patient's delay in seeking medical attention⁵¹.In contrast, it is conceivable that in resource poor countries the distance to next health –care provider may influence the patient attitude towards seeking medical attention⁵². A study conducted in South India Tamilnadu showed that patient and provider delay was significantly associated with the distance travelled and mode of transport³⁴.

In Japan the interval between the occurrence of symptoms and the first contact with health-care provider was 17days,⁵¹ but this varied remarkably between individual patients. Patient delay was also influenced by profession and location of residence.

Health System Delay

Health seeking behavior is known to be influenced in developing countries by factor like patient motivation, degree of diagnostic suspicion by health provider and quality of lab facility⁵³. Stigma associated with TB leads to delay in health seeking behavior even in setup with good health literacy, where delay in diagnosis is also common. Delay in diagnosis results from a variety of factors, including failure to perform sputum microscopy, over-reliance on chest radiographs, and a low level of clinical suspicion. A retrospective survey of 100 Ghanaian adults detected a median delay to diagnosis of 4 months (mean 7.7 months)¹⁶. Delays were associated with failure to perform sputum microscopy and patients were also responsible for the delays, but provider practices resulted in twice the length of delay¹⁶. In Japanese study the median patient delay was 17 days and median doctors delay was 31 days⁵¹. On a global scale, Uplekar *et al.* have pointed out that a large proportion of patients in high prevalence countries such as India, Pakistan, Philippines and Uganda have their main contact with private practitioners, and that many of these tend to deviate from recommended tuberculosis management practices. Many of these practitioners are found in urban slums⁵⁴. A study conducted in Hong Kong showed that 42.6% first presented to private doctors, and 57.4% to the public sector. The diagnosis of tuberculosis was made in 13.7% of these patients by the former and 86.3% by the latter.

According to Reichmann, Hershfield⁵⁵ most important factor for doctors delay was whether a radiographic examination was done or not done at the first visit. The median delay was only 13 days for patients who had chest radiograph done at first visit,

but 50 days for those who were not examined. In studies that evaluated the role of mass miniature radiography, it has been shown that more than 90% of sputum smear positive patients have symptoms, predominantly cough^{56, 57, 19}.

There is little doubt that with decreasing incidence of tuberculosis in most developed countries, physician will think less of tuberculosis as a differential diagnosis.

According to a study in India Provider delay was greater when the patient's first contact was with the private sector. A quarter of patients were not diagnosed even after two actions. The median provider delay when a patient consulted a government provider first was 9 days, compared to 50 days for those consulting a private provider or indigenous (non-allopathic) system first.³⁴

From the above literature it is evident that patient delay ranges from 17 days to maximum one year and age, sex, occupation, knowledge stigma, cultural beliefs, traditional treatments and access to health facilities is associated with delay. Providers delay range between nine days to four months. Degree of diagnostic suspicion, lack of sputum examination and radiographic examination were responsible for providers and system delay.

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ANNEXURE-II

Sample size calculation for recruitment of patients:

Based on CDR (88%) & cure rate of 88% we calculated the sample size within the finite population of the sampling frame as follows:

	Bilaspur
Total population size of NSP cases:	174
CDR (Bilaspur):	88%
Confidence limit:	95
Absolute precision:	$\pm 2.5\%$
α error:	2.5%
Sample size	137

A sample size of 137 was worked out. We over sampled the study participants taking into account of non response rate of 5%. We line listed all the patients in the 1q08 and 2q08 in both the TUs of Bilaspur in chronological order according to the date of diagnosis and chose 1-140 to include in to the study.

ANNEXURE-III

Sample size calculation for recruitment of DOTS providers:

Based on CDR (88%) of Bilaspur we calculated the sample size as follows:

	Bilaspur
Total population size of DOTS providers:	222
Lower CDR (Bilaspur):	88%
Confidence limit:	95%
Absolute precision:	$\pm 5\%$
α error:	5%
Sample size	94

A sample size of 107 worked out. We over sampled the study participants taking into account of non response rate of 10%. We line listed all the DOTS providers of both the TUs of Bilaspur in alphabetical order and chose 1-107, to include in to the study.

Of the total 174 adult NSP cases detected in 1Q08 & 2Q08 in both the TU's of Bilaspur district were listed as per TU' The sample size for adult NSP patients to be surveyed was calculated taking in to account 174 adult NSP patients and the case detection rate averaged out to 88% during 1st and 2nd of 2008. A confidence level of 95% with relative precision (an ∞ error) of 2.5% used for calculation of sample size .Utilizing these parameters a sample size of 137 was calculated using Epi info(version 3.5.1). We rounded of the size to 140.

Number of new smear positive TB patients registered during 1st and 2nd quarter of year 2008 were taken on the basis of number of new smear positive patients registered for treatment during 1st and 2nd quarter in 2007 from both the TU's of district Bilaspur (170patients), We took the sample size of 170 patients on the basis of patients diagnosed during 1st and 2nd quarter of 2008.

The sample size for doctors surveyed was calculated taking in to account the sampling frame of 48 and the cure rate of NSP patients averaged out to 88% for the 1st quarter of 2007 and 2nd quarter of 2007 from the record at the time of the survey. A Confidence level of 95% with relative precision (an α error) of 5% used for calculation of sample size. Utilizing these parameters a sample size of 38 was calculated using Epi info (version 3.3.2). Taking into account 10% non respondents and not satisfying inclusion criteria, a total sample size worked out and rounded of to 41.

The sample size for DOTS providers surveyed was calculated taking in to account the sampling frame of 222 and the cure rate for NSP patients averaged out to 88% for the 1st and 2nd quarter of 2008 from the record at the time of the survey. A Confidence level of 95% with relative precision (an α error) of 5% used for calculation of sample size. Utilizing these parameters a sample size of 94 was calculated using Epi info (version 3.3.2). Taking into account 10% non respondents and not satisfying inclusion criteria, a total sample size worked out and rounded of to 103

1 MOTU was interviewed because at present there is only one designated MOTU in Bilaspur district.

All the STS,STLS and 11 Lab Technician's of 12 DMC's,1 DTO were included in the study

ANNEXURE-IV

Sampling Procedure:

We paid maximum of three visits to interview study participant after which we recruited the next participant for interview from the line list to overcome the selection bias.

ANNEXURE-V

List of Factors studied for patient related delay

1. Age
2. sex
3. Caste
4. Education
5. Place of residence
6. Income
7. Occupation
8. Marital Status
9. Type of family
10. Size of family
11. Type of house
12. Smoking and Alcohol consumption
13. Duration of cough
14. Distance between residence and microscopy center
15. Health facility first contacted
16. Knowledge of TB
17. Stigma associated with TB

Lists of factors studied for providers related delays

1. Health facility first contacted
2. Level of Government health facility
3. Number of consultations
4. Referral pattern

5. Sputum smear examination for AFB
6. Age
7. Gender
8. Caste
9. Qualification
10. Place of residence
11. Income
12. Occupation
13. Marital Status
14. Type of family
15. Size of family
16. Type of house
17. Smoking habits
18. Alcohol consumption
19. Duration of cough

ANNEXURE – VI

Name of principal investigator:

Name of organization:

Name of sponsor:

INFORMATION SHEET FOR PATIENTS PARTICIPATING IN THE RESEARCH

“Health seeking behavior & delay in diagnosis and treatment under RNTCP, Bilaspur, Himachal Pradesh, 2008”

I am

Working for the

TB is a major health problem in our district. We are trying to study. Health seeking behavior & delay in diagnosis and treatment under RNTCP, Bilaspur, Himachal Pradesh, 2008

Purpose:

The purpose of this study is to generate information on the. Health seeking behavior & delay in diagnosis and treatment under RNTCP, The information generated through the study will assist in planning suitable interventions to further improve the services under RNTCP.

Procedures:

We invite you to take part in the study to answer the above mentioned research questions.

You will be interviewed using semi structured questionnaire and your answers to the questions in the questionnaire will be filled by the principal investigator.

The study is totally risk free for you. The study does not involve any invasive procedure or tests. The study will not implicate or hold you responsible for the results, and no harm will be caused to you.

Benefits:

The information generated through the study will assist in planning suitable interventions to further improve the services under RNTCP.

Incentives:

You will not be provided with any incentive to take part in the research

Confidentiality:

The information that we collect from this research project will be kept confidential. Information about you that will be collected from the study will be stored in a file which will not have your name on it. Which number belongs to which name will be kept under lock and key, and will not be divulged to anyone except to the data processing unit.

Right to refuse or withdraw:

Your participation in the study is entirely on a voluntary basis. You can choose to leave the study at any time. The principal investigator can decide any time to delist you from the study.

Alternatives to participation:

If you do not want to participate in the study, you are free to do so. This will not affect current or future medical care at this centre. It will not affect your relationship with the health staff in any way.

Whom to contact:

This proposal has been reviewed and approved by the Institutional Ethics Committee of National Institute of Epidemiology, Chennai-77 which is a committee whose task is to make sure that research participants are protected from harm. If you wish to find more about the committee and have any questions, you may contact:

Local Principal Investigator:

(1) Name:.....

Address:.....

.....

Phone:.....

Name of principal investigator:

Name of organization:

Name of sponsor:

INFORMATION SHEET FOR DOCTOR PARTICIPATING IN THE RESEARCH

“Health seeking behavior & delay in diagnosis and treatment under RNTCP, Bilaspur, Himachal Pradesh, 2008”

I am

Working for the

.....

TB is a major health problem in our district. We are trying to study. “Health seeking behavior & delay in diagnosis and treatment under RNTCP, Bilaspur, Himachal Pradesh, 2008”

Purpose

The purpose of this study is to generate information on the “Health seeking behavior delay in diagnosis and treatment under RNTCP”

. The information generated through the study will assist in planning suitable interventions to further improve the services under RNTCP.

Procedures:

We invite you to take part in the study to answer the above mentioned research questions.

You will be interviewed using semi structured questionnaire and your answers to the questions in the questionnaire will be filled by the principal investigator.

The study is totally risk free for you. The study does not involve any invasive procedure or tests. The study will not implicate or hold you responsible for the results, and no harm will be caused to you.

Benefits:

The information generated through the study will assist in planning suitable interventions to further improve the services under RNTCP.

Incentives:

You will not be provided with any incentive to take part in the research

Confidentiality:

The information that we collect from this research project will be kept confidential. Information about you that will be collected from the study will be stored in a file which will not have your name on it. Which number belongs to which name will be kept under lock and key, and will not be divulged to anyone except to the data processing unit.

Right to refuse or withdraw:

Your participation in the study is entirely on a voluntary basis. You can choose to leave the study at any time. The principal investigator can decide any time to delist you from the study.

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Whom to contact:

This proposal has been reviewed and approved by the Institutional Ethics Committee of National Institute of Epidemiology, Chennai-77 which is a committee whose task is to make sure that research participants are protected from harm. If you wish to find more about the committee and have any questions, you may contact:

Local Principal Investigator:

(1) Name:.....

Address:.....

.....

Phone:.....

Name of principal investigator:

Name of organization:

Name of sponsor:

INFORMATION SHEET FOR LABORATORY TECHNICIAN PARTICIPATING IN THE
RESEARCH

“Health seeking behavior & delay in diagnosis and treatment under RNTCP, Bilaspur,
Himachal Pradesh, 2008”

I am

Working for the

.....

TB is a major health problem in our district. We are trying to study the “Health seeking
behavior & delay in diagnosis and treatment under RNTCP, Bilaspur, Himachal Pradesh,
2008”

Purpose:

The purpose of this study is to generate information on the “Health seeking behavior & delay
in diagnosis and treatment under RNTCP”

. The information generated through the study will assist in planning suitable interventions to
further improve the services under RNTCP.

Procedures:

We invite you to take part in the study to answer the above mentioned research questions.

You will be interviewed using semi structured questionnaire and your answers to the
questions in the questionnaire will be filled by the principal investigator.

The study is totally risk free for you. The study does not involve any invasive procedure or
tests. The study will not implicate or hold you responsible for the results, and no harm will be
caused to you.

Benefits:

The information generated through the study will assist in planning suitable interventions to
further improve the services under RNTCP.

Incentives:

You will not be provided with any incentive to take part in the research

Confidentiality:

The information that we collect from this research project will be kept confidential. Information about you that will be collected from the study will be stored in a file which will not have your name on it. Which number belongs to which name will be kept under lock and key, and will not be divulged to anyone except to the data processing unit.

Right to refuse or withdraw:

Your participation in the study is entirely on a voluntary basis. You can choose to leave the study at any time. The principal investigator can decide any time to delist you from the study.

Alternatives to participation:

If you do not want to participate in the study, you are free to do so. This will not affect current or future medical care at this centre. It will not affect your relationship with the health staff in any way.

Whom to contact:

This proposal has been reviewed and approved by the Institutional Ethics Committee of National Institute of Epidemiology, Chennai-77 which is a committee whose task is to make sure that research participants are protected from harm. If you wish to find more about the committee and have any questions, you may contact:

Local Principal Investigator:

(1) Name:.....

Address:.....

.....

Phone:.....

Name of principal investigator:

Name of organization:

Name of sponsor:

INFORMATION SHEET FOR STS / STLS / DOT PROVIDERS

“Health seeking behavior & delay in diagnosis and treatment under RNTCP, Bilaspur, Himachal Pradesh, 2008”

I am

Working for the

.....

TB is a major health problem in our district. We are trying to study the Health seeking behavior & delay in diagnosis and treatment under RNTCP, Bilaspur, Himachal Pradesh, 2008.

Purpose:

The purpose of this study is to generate information on Health seeking behavior & delay in diagnosis and treatment on the under RNTCP. The information generated through the study will assist in planning suitable interventions to further improve the services under RNTCP.

Procedures:

We invite you to take part in the study to answer the above mentioned research questions.

You will be interviewed using semi structured questionnaire and your answers to the questions in the questionnaire will be filled by the principal investigator.

The study is totally risk free for you. The study does not involve any invasive procedure or tests. The study will not implicate or hold you responsible for the results, and no harm will be caused to you.

Benefits:

The information generated through the study will assist in planning suitable interventions to further improve the services under RNTCP.

Incentives:

You will not be provided with any incentive to take part in the research

Confidentiality:

The information that we collect from this research project will be kept confidential. Information about you that will be collected from the study will be stored in a file which will not have your name on it. Which number belongs to which name will be kept under lock and key, and will not be divulged to anyone except to the data processing unit.

Right to refuse or withdraw:

Your participation in the study is entirely on a voluntary basis. You can choose to leave the study at any time. The principal investigator can decide any time to delist you from the study.

Alternatives to participation:

If you do not want to participate in the study, you are free to do so. This will not affect current or future medical care at this centre. It will not affect your relationship with the health staff in any way.

Who to contact:

This proposal has been reviewed and approved by the Institutional Ethics Committee of National Institute of Epidemiology, Chennai-77 which is a committee whose task is to make sure that research participants are protected from harm. If you wish to find more about the committee and have any questions, you may contact:

Local Principal Investigator:

(1) Name:.....

Address:.....

.....

Phone:.....

PATIENT CONSENT FORM

Centre code:

Patients Identification Number:

Patient's Name:

I have been invited to participate in the research study 'Health seeking behavior & delay in diagnosis and treatment under RNTCP, Bilaspur, Himachal Pradesh, 2008

I have been told the purpose of this study is to generate information on Health seeking behavior & delay in diagnosis and treatment under RNTCP,

I have been told that I would not be exposed to any disease or medication and there is no danger of this study to me and the chance of benefit is much greater.

I am aware of my right to opt out of the study at any time during the course of the study without having to give the reasons for doing so. I will still be eligible for the benefit accrued by the study.

I understand that I would be free to ask questions to the doctor about the information collected from me at any time. By signing my name below, I would be responsible to provide information to the investigator.

I have been informed to my satisfaction the nature of study. I, exercising my free power of choice, hereby give my consent to be included as a subject in the study Health seeking behavior & delay in diagnosis and treatment under RNTCP,

Signed by:.....

Date.....

Place.....

If illiterate

Signed by the researcher.....

In the presence of an independent literate witness

.....Date.....Place.....

CONSENT FORM FOR DOCTOR

Centre code:

Doctors Identification Number:

Doctor's Name:

I have been invited to participate in the research study 'Health seeking behavior & delay in diagnosis and treatment under RNTCP, Bilaspur, Himachal Pradesh, 2008.

I have been told the purpose of this study is to generate information on Health seeking behavior & delay in diagnosis and treatment under RNTCP,

I have been told that I would not be exposed to any disease or medication and there is no danger of this study to me and the chance of benefit is much greater.

I am aware of my right to opt out of the study at any time during the course of the study without having to give the reasons for doing so. I will still be eligible for the benefit accrued by the study.

I understand that I would be free to ask questions to the researcher about the information collected from me at any time. By signing my name below, I would be responsible to provide information to the investigator.

I have been informed to my satisfaction the nature of study. I, exercising my free power of choice, hereby give my consent to be included as a subject in the study Health seeking behavior & delay in diagnosis and treatment under RNTCP,

Signed by:.....

Date.....

Place.....

CONSENT FORM FOR LABORATORY TECHNICIAN

Centre code:

Pharmacists Identification Number:

Lab. Technician's Name:

I have been invited to participate in the research study 'Health seeking behavior & delay in diagnosis and treatment under RNTCP.

I have been told the purpose of this study is to generate information on Health seeking behavior & delay in diagnosis and treatment under RNTCP, if any.

I have been told that I would not be exposed to any disease or medication and there is no danger of this study to me and the chance of benefit is much greater.

I am aware of my right to opt out of the study at any time during the course of the study without having to give the reasons for doing so. I will still be eligible for the benefit accrued by the study.

I understand that I would be free to ask questions to the researcher about the information collected from me at any time. By signing my name below, I would be responsible to provide information to the investigator.

I have been informed to my satisfaction the nature of study. I, exercising my free power of choice, hereby give my consent to be included as a subject in the study Health seeking behavior & delay in diagnosis and treatment under RNTCP,

Date.....

Place.....

CONSENT FORM FOR STS / STLS / DOTS PROVIDER

Centre code:

Identification Number:

Name:

I have been invited to participate in the research study 'Health seeking behavior & delay in diagnosis and treatment under RNTCP, Bilaspur, Himachal Pradesh, 2008.

I have been told the purpose of this study is to generate information on Health seeking behavior & delay in diagnosis and treatment under RNTCP,

I have been told that I would not be exposed to any disease or medication and there is no danger of this study to me and the chance of benefit is much greater.

I am aware of my right to opt out of the study at any time during the course of the study without having to give the reasons for doing so. I will still be eligible for the benefit accrued by the study.

I understand that I would be free to ask questions to the researcher about the information collected from me at any time. By signing my name below, I would be responsible to provide information to the investigator.

I have been informed to my satisfaction the nature of study. I, exercising my free power of choice, hereby give my consent to be included as a subject in the Health seeking behavior & delay in diagnosis and treatment under RNTCP,

Signed by:.....

Date.....

Place.....

QUESTIONNAIRE - PATIENT

(CONFIDENTIAL)

We are interested in knowing what is the situation of patients of Tuberculosis who have been put on DOTS in district Bilaspur Himachal Pradesh. I will ask you some questions. Kindly spare five minutes and help us improve the services.

Data collection instrument for newly diagnosed smear positive pulmonary tuberculosis adult patients (study subjects) of Tuberculosis in district Bilaspur, Himachal Pradesh.

I. Identification information from the DTC/TU

I D. NO. _____ Date of Interview _____

T.B. NO. _____

Name & ID NO. of the interviewer _____

Name of the tuberculosis unit (TU) where registered _____

Name of the DOTS center providing treatment _____

Name of the microscopy center (MC)/other institution where diagnosed _____

Name of the Patient: _____

Father's/Husband's/Guardian's name: _____

Complete residential address _____

II. Identification information from the patient

1. ID. No.
2. Area
- Urban (1)
 - Sub urban (2)
 - Rural (3)
 - Homeless/displaced/migrator (4)
3. Age (calculated in years and months)
4. Date of birth
- Day month year
5. Marital status
- Single (1)
 - Married (2)
 - Divorced (3)
 - Widowed (4)
 - Separated (5)

III Socio- cultural factors

6. Type of family
- Nuclear (1)
 - Non nuclear (2)
7. Family size

- < 3 (1)
- 3-5 (2)
- 6-7 (3)
- >7 (4)

8. Religion:

- Hindu (1)
- Christian (2)
- Muslim (3)
- Buddhist (4)
- Sikh (5)
- Other, specify (89)

9. Caste:

- SC (1)
- ST (2)
- OBC (3)
- GC (4)
- Other, specify (89)

10. Address

11. Duration of stay at present address

12. Native Place

13. Frequency of visits to native place

- Frequently (1)
- Rarely (2)
- None (99)

15 Educational Status

- 1. Illiterate

- 2. Below 5th standard
- 3. Primary
- 4. Middle
- 5. Matric
- 6. Senior secondary
- 7. Graduate
- 8 Postgraduate

Behavior of Patient

1. History of smoking

- a. Never
- b. Current smoker
- c. Quitted smoking/Ex-smoker

2. If smoker, No. of bidis /cigarettes smoked per day _____

3. Duration of smoking: Years _____; Months) _____

4. Do you consume alcohol?

- 1. Yes
- 2. No

5. If yes,

1. Approximate quantity consumed in one sitting (ml.) _____

2. Frequency of drinking (1. Occasionally; 2. Once a month;

3. Once a week; 4. More than once a week but not daily; 5. Daily)

IV. Socio-economic status

1 Total Income per month

a. Patient

b. Family

2 Place of living:

Rented

(0)

Own (1)

3 Type of house:

Kutcha (1)

Semi Pucca (2)

Pucca (3)

Bungalow (4)

4 Occupation

- 1. Agriculture
- 2. Unskilled workers
- 3. Professional
- 4. Industrial & Factory workers
- 5. Service class people
- 6. Business
- 7. Unemployed
- 8. Student,
- 9. Housewife
- 10. Other (please specify)_____

V Symptoms and Duration Symptoms and Duration

1. Date of onset of various symptoms of pulmonary tuberculosis.

Symptom	Date of onset
1.Cough	_____
2.Fever	_____
3.Weight loss	_____
4.Hemoptysis	_____
5.Chest pain	_____
6.Dyspnoea	_____
7.Others symptoms (specify).....	_____

2. What do you think caused the above symptoms listed

May be a cold (1)

Vague worry about symptoms (2)

May be tuberculosis (3)

May be asthma (4)

Others specify (89)

None (99)

3. Symptoms duration

Fever	Cough	Expectoration	Blood in sputum	Chest pain	Breathlessness	Others

Codes for duration of symptoms

- No symptom (0)
- 1 < 15 days (1)
- 15 < 21 days (1)
- 21 days < 1 month (3)
- 1 month < 2 months (4)
- 2 month < 3 months (5)
- 3 month < 6 months (6)
- 6 month < 12 months (7)
- >12 months (8)

VI. Information on KAP

1. Have you heard of TB
 - Yes (1)
 - No (2)
2. If yes, what do you know? Give details

.....

.....

.....

.....

.....

3. What is the cause of TB?

1. TB germs
2. Lack of proper food
3. Addiction to smoking
4. Overwork
5. Worries
6. God's curse
7. Fate
8. Poor hygiene
9. None

4. What tests were carried out by the health facility?

- (a) Sputum examination
- (b) X-ray chest
- (c) Blood test
- (d) Physical examination
- (d) Mantoux test
- (e) Urine examination
- (f) Others, specify
- (g) None

5. Patient's knowledge of TB

Had you ever heard of TB before you were diagnosed as having TB?

(Yes=1; No=0)

When should one suspect that he/she has TB? _____

Is TB curable? (Yes=1; No=0)

Do you know the approximate duration of treatment of TB?

(Correct=1; Wrong=0)

Is TB hereditary? (Correct=1; Wrong=0)

Is TB contagious? (Correct=1; Wrong=0)

Do you know if there is a vaccine for TB? (Correct=1; Wrong=0)

6. Source of information about TB.

Health department campaigns (1)

TV (2)

Radio (3)

Print media (4)

TB disease amongst Friends/Relative(5)

None (99)

Others (specify)_____ (89)

7. Have you been told by health service providers about the duration of treatment you have to take?
(Yes 1; No 2)

8. If yes, for how long?(write the duration as told by the patient)_____

9. Have you been told by the DOTS provider about the common side effects of medicines that you are taking?
(Yes 1; No 2)

10. If yes, what are those side effects?
a. _____
b. _____
c. _____
d. _____
e. _____

VII. Treatment seeking behavior

1. Preference for health facility

Indifference to ailments (1)

Self medication (2)

Pharmacy (3)

Native medicines (4)

Specialist care (5)

Govt. Health facility (6)

Others, specify (7)

2. Which symptom(s) made you seek healthcare (please tick all that apply)

Cough

Fever

Weight loss

Hemoptysis

Chest pain

Dyspnoea

Others symptoms (specify) _____

3. Health facility first contacted for above complaints.

Type of health facility	Date contacted
Government health facility	
Private health facility	
Charitable institution	
Tradition healer	
Drug stores (pharmacies)	
Self-medication	
Others (specify)	

4. If contacted government health facility, then the level of health facility

District/state level (1)

Sub-district hospital (2)

Community health center (CHC) (3)

- Primary health center (PHC) (4)
- Civil dispensary (CD) (5)
- Health sub-center (HSC) (6)
- Ayurvedic hospital/dispensary (7)
- Others (specify)_____ (89)

5. If contacted a private practitioner, then the specialty of the practitioner:

- Chest specialist (1)
- Physician (2)
- General practitioner (MBBS) (3)
- Ayurvedic doctor (BAMS) (4)
- Others (specify)_____ (89)

6. Reasons for choosing first health facility (as mentioned in question no. 19)

- Easy accessibility (1)
- Confidence in getting cured (2)
- Services available anytime (3)
- Free services (4)
- Advised by somebody (5)
- Others specify_____ (89)

7. No. of consultations taken before the diagnosis of TB _____

8. Was your sputum examined during any one of these consultations?

9. Was x-ray examination of your chest done during any of these vis

10. Date first seen by an institution covered by RNTCP.....

11. Date of diagnosis of tuberculosis (by sputum microscopy)

12. Health facility that made the initial TB diagnosis _____

13. Diagnosis

14. Date of starting DOTS

15. Reasons for **not** choosing this facility (that diagnosed PTB) earlier?

Too far (1)

Too busy/long waiting time (2)

Bad experience/bad attitude of staff (3)

Others, specify (4)

16. Who advised you to consult the present facility?

1. Referred by previous health provider consulted (1)

2. Self referral (2)

3. Family members/relatives (3)

4. Advised by other TB patients (4)

5. Health worker (5)

6. Any other (please specify) (89)

17. Interval between appearance of symptoms and final diagnosis of TB

18. Interval between diagnosis and initiation of DOTS (days)

VIII. Stigma

1. Tuberculosis stigma (No/disagree=0; Can't say =1; Yes/agree=2)

Do you feel ashamed for having TB?

Do you have to hide TB diagnosis from other people?

Does TB affect relation with the others?

Is TB very costly due to long duration of the disease?

Do you prefer to live isolated since you got TB diagnosis?

Does the TB affect your work performance?

Does TB affect marital relation?

Does TB affect family responsibilities?

Do you think there is less chances of marriage due to TB diagnosis?

Does TB affect your family relations?

Does TB cause female infertility?

Does TB lead to serious complications during pregnancy?

Does TB affect breast feeding?

Does TB affect pregnancy outcome?

Is a girl unable to decide for getting TB treatment

IX. Societal Reaction

1. Do you think that you will be ostracized if your

a. Family []

b. Relatives []

c. Friends []

Come to know about your disease.

2. Do you feel you get adequate economic & social support since the illness from

a. Family [Yes] [No]

b. Co-workers [] []

- c. Community [] []
3. Since the illness have you been taking part in social functions?
 Yes [] No []
4. Have your employment/ educational oppurtunities jeopardized due to illness?
 Yes [] No []
5. Have you experienced any marital problems since the onset of illness?
 Yes [] No []
6. Have there been family disharmony or discard due to illness?
 Yes [] No []
7. Do you find any difference in participation in social activities after the start of illness?
 Yes [] No []
8. Since the onset of illness do you find there is change in your role playing?
 Family Yes [] No []
 Society Yes [] No []
9. Did any of the above prevent you
 a) Or delay you in seeking help?
 b) Or help you to decide where you would seek help?

X. Patients perception about Health facility

		Govt.	Private
1) Hospitable	Yes	[]	[]
	No	[]	[]
2) Long waiting hours	Yes	[]	[]
	No	[]	[]
3) Inconvenient working hours	Yes	[]	[]
	No	[]	[]
4) Too costly/bribe	Yes	[]	[]

No [] []

5) Non availability of

a) Equipments Yes [] []

No [] []

b) Manpower Yes [] []

No [] []

c) Drugs Yes [] []

No [] []

XI. Access

1 Distance between:

Nearest DOTS Center and residence of patient (kms) _____

Microscopy center and residence of patient (kms) _____

2 Distance covered each time to take DOTS

By Bus (kms)

On foot (kms)

Other means (please specify) _____

3 Transport home to Health Centre

By walk (1)

By bus (2)

By train (3)

By cycle (4)

By auto (5)

Other, specify (89)

4 Time taken to reach DOTS center

- <1/2 hour (1)
- 1/2 to 1 hour (2)
- >1 hour (3)

XII. Perception on attitude, behavior, services and capability of DOTS provider

5 Who is your DOT provider

District level (1)

Sub-district hospital (2)

CHC level (3)

PHC level (4)

Civil dispensary (5)

Sub-center level (6)

Below sub-center level (e.g. Panchyati raj institutions, volunteers). (7)

Private Hospital/clinic (8)

NGO (9)

Others (specify) _____ (89)

6 Satisfaction with care

(Unsatisfactory=0; can't say=1; Satisfactory=2)

1. Availability of staff/DOTS provider

2. Behavior of DOTS provider with respect to your treatment

3. Are the TB drugs readily available with the DOTS provider

4. How much time do you have to wait at DOTS center (exact time)
(≤ 15min =3; 15-<30 min=2; 30 mn-1 hr=1; >1 hr=0)

- 7 Perceived causes of delay in diagnosis/treatment initiation
- a. No delay
 - b. Poor knowledge of the disease
 - c. Fear of what would be found on diagnosis
 - d. Hoped symptoms would go away on their own (denial & concealment)
 - e. Fear of social isolation
 - f. Economic constraints
 - g. Symptoms were mild
 - h. Distance of facility not convenient (too far)
 - i. Inadequate staff attitude
 - j. Poor quality of health services
 - k. Others (specify)_____

QUESTIONNAIRE - DTO

(CONFIDENTIAL)

We are interested in knowing what is situation of patients of Tuberculosis who have been placed on DOTS in district Bilaspur Himachal Pradesh. I will ask you some questions. Kindly spare five minutes and help us improve the services.

Data collection instrument for DTO in the health facilities in district Bilaspur Himachal Pradesh.

I. Identification information

1. ID. No.

2. Name of DTO _____

3. No. of service years in the district _____

4. Name of institution _____

5. Name of TU _____

6. When was the RNTCP started in District Bilaspur of Himachal Pradesh?

7. What is the population coverage under RNTCP?

8. How many TUs are there in your district?

9. Are you trained in RNTCP?

Yes (1)

No (2)

10. If yes, How long ago?

11. Where and by whom?

12. How many MOTC are there in place in the TUs?

One (1)

Two (2)

Three (3)

13. How many MOTC are trained?

One (1)

Two (2)

Three (3)

14. How many DMCs are there in your district?

15. How many DMCs have LTs?

16. How many LTs are trained?

17. Do all the DMCs have recommended infrastructure?

Yes (1)

No (2)

18. Do all the DMCs have binocular microscope?

Yes (1)

No (2)

19. What are the indicators for the 1Q08?

Case Detection Rate _____

Cure Rate _____

Sputum Conversion Rate _____

Default Rate _____

Failure Rate _____

20. Is any RNTCP training for Medical Officers and health workers organized?

21. How many technical and administrative review meetings do you hold with MOTC and all STS/STLS in a year?

22. How often do you visit Tuberculosis Unit of your district in a quarter?

23. How often do you visit the Microscopic Centers of your district?

24. Do you have supervisory visits schedule?

25. Out of all PHIs how many of each category were paid supervisory visits during 2007?

<i>Type of PHI</i>	<i>Number</i>	<i>No. visited</i>	<i>Total no. implemented</i>
DMC
PHC (X-ray)
DOT Centres

26. How often does the District Magistrate review the programme and facilitates coordination with other sectors / programmes?
27. How often does the Chief Medical Officer review the programme and facilitates?
28. During last year how many patients were examined
New cases.....
Follow up cases
29. During last year how many cases were positive?
New cases.....
Follow up cases
30. Has there been any drug stock out in the District in the past one year?
31. Has there been any expiry of drugs in the District in the past one year?
32. Is the RNTCP being implemented successfully in the district?
33. In your opinion what further steps can make the programme more successful?
- 34 Opinion on diagnostic delay.
- I. Is delay a problem
 - II. Average length of delay
 - III. Likely reasons for delay ?

OBSERVATIONAL CHECKLIST – DTO

(CONFIDENTIAL)

Name of the DTO _____

DTC _____ Distt. _____

<i>S. No.</i>	<i>Questions</i>	<i>Yes / No</i>	<i>Number Trained</i>	<i>Total</i>
1	Are all the MOs in the TU/DMC/PHI trained in RNTCP?			
2	Are all the LTs in the TU/DMC/PHI trained in RNTCP?			
3	Is the copy of last monthly PHI report available in the DTC?			
4	Does all the MOs review patients treatment activities with health worker on a fortnightly basis			
5	Do the MO visit regular / defaulting patients to bring them back on treatment?			
6	Is the supervisory register available and maintained?			
7	Is there any visible IEC material in the DTC campus			
8	Does the DTC have adequate drug stock to last one month?			
9	Are sufficient funds available with the DTO?			
10	Are sufficient stocks of medicines available?			
11	Are sufficient stocks of lab reagents available?			
12	Are sufficient stocks of binocular MCs available?			
13	Is data entry operator in place?			
14	Are quarterly reports being sent regularly to the higher ups?			
15	Do superiors visit your DTC on regular basis?			

QUESTIONNAIRE - MOTC

(CONFIDENTIAL)

We are interested in knowing what is situation of patients of Tuberculosis who have been placed on DOTS in district Bilaspur Himachal Pradesh. I will ask you some questions. Kindly spare five minutes and help us improve the services.

Data collection instrument for MOTC in the health facilities in district Bilaspur Himachal Pradesh.

I. Identification information

1. ID. No.

2. Name of MOTC _____

3. No. of service years in the district _____

4. Name of institution _____

5. Name of TU _____

6. Area

Rural (1)

Urban (2)

7. What is the population of the area served by this TU?

8. What are the numbers of outpatients for last one year?

9. How many sputum examinations done for TB suspects? How many tested positive?

10. What is the staff available in the institution?

11. What definition do you use for TB suspect?

12. Where does screening of TB suspect take place?

13. Who does the screening of TB suspect?

14. How is the screening of TB suspect done?

15. What routine investigation is advised for TB suspects?
16. How many new patients do you see per day?
17. How many sputum smear examinations are advised for a TB suspect?
18. Where does patient get their treatment?
19. What treatment categories, regimens and dosage are used?
20. Who directly observe treatment?
21. What quantity of medicines is dispensed in the intensive phase?
22. What quantity of medicine is dispensed in the continuous phase?
23. Who gives patient education and counseling?
24. How often are patients called for follow up during treatment?
25. How often are smear examinations ordered during treatment?
26. By whom, when and how is the late patient tracing done?
27. Who maintains treatment cards and TB registers?
28. Who prepares the quarterly reports?
29. Is there a system for cross checking the TB registers with the laboratory register?
30. How often health workers trained?
31. How often do RNTCP supervisors visit the institution?
32. Do supervisors use a supervision checklist?
33. Is feedback verbal or written provided by the supervisors?
34. How often do supplies of medicines come?
35. Are quantities sufficient?
36. How many supervisory visits have you made in last one month to the Peripheral Health Institutions?
37. What was the smear conversion rate reported for the TU in the last quarter?
38. What was the cure rate reported for the TU in the last quarter?
39. What are the IEC activities done during the last one year?

40. Opinion on diagnostic delay.

- I. Is delay a problem

- II. Average length of delay

- III. Likely reasons for delay ?

OBSERVATIONAL CHECKLIST - MOTC

(CONFIDENTIAL)

Name of the MOTC _____

TU _____ Distt. _____

<i>S. No.</i>	<i>Questions</i>	<i>Yes/ No</i>	<i>Number</i>	<i>Total</i>
1	Are all the MOs in the TU trained in RNTCP?			
2	Is the copy of last monthly PHI report available in the TU?			
3	Does the MO review patients treatment activities with health worker on a fortnightly basis			
4	Does the MO visit regular / defaulting patients to bring them back on treatment?			
5	Is the supervisory register available and maintained?			
6	Is there any visible IEC material in the TU level?			
7	Does the TU have adequate drug stock to last one month?			

QUESTIONNAIRE – MO (DMC)

(CONFIDENTIAL)

We are interested in knowing what is situation of patients of Tuberculosis who have been placed on DOTS in district Bilaspur Himachal Pradesh. I will ask you some questions. Kindly spare five minutes and help us improve the services.

Data collection instrument for MO (DMC) in the health facilities in district Bilaspur Himachal Pradesh.

I. Identification information

1. ID. No.

2. Name of MO (DMC) _____

3. No. of service years in the district _____

4. Name of institution _____

5. Name of TU _____

6. Name of the DOTS centre _____

7. Area

Rural (1)

Urban (2)

8. What is the population of the area served by this DMC?

9. What are the numbers of outpatients for last one year?

10. What is the definition used for TB suspect?

11. Where does screening of TB suspect take place?

12. Who does the screening of TB suspect?

13. How is the screening of TB suspect done?

14. What routine investigation is advised for TB suspects?

15. How many sputum smear examinations are advised for a TB suspect?

16. What treatment categories, regimens and dosage are used?

17. Who directly observe treatment?

18. What quantity of medicines is dispensed in the intensive phase?

19. What quantity of medicine is dispensed in the continuous phase?
20. Who gives patient education and counseling?
21. How often are patients called for follow up during treatment?
22. How often are smear examinations ordered during treatment?
23. By whom, when and how is the late patient tracing done?
24. Who maintains treatment cards and TB registers?
25. Who prepares the quarterly reports?
26. Is there a system for cross checking the TB registers with the laboratory register?
27. When was the last RNTCP training for health workers in the institution?
28. How often are health workers trained?
29. How often do RNTCP supervisors visit the institution?
30. Do supervisors use a supervision checklist?
31. Is feedback verbal or written provided by the supervisors?
32. How often do supplies of medicines come?
33. Are quantities sufficient?
34. Has there ever been shortage of ant TB medicines?
35. What was the number of sputum smears examined last month in the MC and what percentages of them were positive.
36. How often do you review patient treatment activities with Multi Purpose Worker?
37. Opinion on diagnostic delay.
 - I. Is delay a problem
 - II. Average length of delay
 - III. Likely reasons for delay ?

OBSERVATIONAL CHECKLIST – MO (DMC)

(CONFIDENTIAL)

Name of the DMC _____ Distt. _____

<i>Questions</i>	<i>Yes / No</i>	<i>Number</i>	<i>Total</i>
Are all the MOs in the DMC trained in RNTCP?			
Is the copy of last monthly PHI report available in the DMC?			
Does the MO review patients treatment activities with health worker on a fortnightly basis			
Does the MO visit regular / defaulting patients to bring them back on treatment?			
Is the supervisory register available and maintained?			
Is there any visible IEC material in the DMC campus			
Does the DMC have adequate drug stock to last one month?			

QUESTIONNAIRE - DOCTORS

(CONFIDENTIAL)

We are interested in knowing what is situation of patients of Tuberculosis who have been placed on DOTS in district Bilaspur Himachal Pradesh. I will ask you some questions. Kindly spare five minutes and help us improve the services.

Data collection instrument for Doctors in the health facilities in district Bilaspur, Himachal Pradesh.

I. Identification information:

1. ID. No.
2. Name of Doctor _____
3. No. of service years in the district _____
4. Name of institution _____
5. Name of TU _____

I. KAP:

6. Distance of Primary Health Centre from DTC?
 < 10 KMs (1)
 10-20 Ms (2)
 20-30 KMs (3)
 30-40 KMs (4)
 >40 KMs (5)
7. What proportion of time is spent by you on RNTCP per day?
 1 Hr (1)
 2 Hrs (2)
 3 Hrs (3)
8. When was your centre implemented under DTP?
9. What are the signs and symptoms that make you suspect that a patient has TB?

10. How many new patients do you see per day (average for last one year)?

11. What is your definition to diagnose 'Chest symptomatic'?

12. Is information recorded on chest symptomatics for whom sputum smears have been requested

13. How many sputum samples are taken for each case chest symptomatic?

One (1)

Two (2)

Three (3)

14. Once the diagnosis of TB is confirmed what information counseling do you provide to the patient?

15. Have you been trained in TB case finding and treatment?

Yes (1)

No (2)

16. If yes how long ago?

17. How many patients have you seen in the OPD in the last month?

18. How many TB suspects have you referred to the nearest DMC in the last month?

19. How often have you missed sending the monthly report on treatment during the last year and why?

20. How often you receive reports back from them?

21. Do you receive regular supply to perform the job?

22. Have you experienced any shortage in drugs, materials?

Yes (1)

No (2)

23. Do you interact with the private sector?

Yes (1)

No (2)

24. How often?

Once a month (1)
Once in three months (2)

25. Do you interact with NGOs?

Yes (1)
No (2)

26. How often?

Once a month (1)
Once in three months (2)

27. Do you interact with voluntary organizations?

Yes (1)
No (2)

28. How often?

Once a month (1)
Once in three months (2)

29. Do you interact with other disease control programme?

Yes (1)
No (2)

30. How often?

Once a month (1)
Once in three months (2)

31. What are the major problems you face in providing TB services?

32. Diagnostic delay: Is it a problem

Yes (1)
No (2)

33. How much is the delay in seeking care by the patients (average)

.....

QUESTIONNAIRE – LAB TECHNICIAN

(CONFIDENTIAL)

We are interested in knowing what is situation of patients of Tuberculosis who have been placed on DOTS in district Bilaspur Himachal Pradesh. I will ask you some questions. Kindly spare five minutes and help us improve the services.

Data collection instrument for Laboratory Technicians (DMC) in the health facilities in district Bilaspur Himachal Pradesh.

I. Identification information

1. ID. No.

2. Name of Doctor _____

3. No. of service years in the district _____

4. Name of institution _____

5. Name of TU _____

6. Area

Rural (1)

Urban (2)

7. When you get the samples how much time did you take to process them.

Same day (1)

1-3 days (2)

>3 days (3)

8. When did you give report

Next day (1)

1-3 days (2)

>3 days (3)

9. When did you disseminate the information to the patient?

Same day (1)

1-3 days (2)

>3 days (3)

10. What are the numbers of staff working in the laboratory?

One (1)

Two (2)

Three (3)

11. What is the number of staff who does smear examination?

One (1)

Two (2)

Three (3)

12. What are number of sputum smears examined each day for AFB?

< 10 (1)

10 - 20 (2)

20 - 30 (3)

> 30 (4)

13. What are number of sputum smears examined each month for AFB?

< 200 (1)

200 - 300 (2)

300 - 400 (3)

> 400 (4)

14. What are number of sputum smears examined each year for AFB?

< 2000 (1)

2000 - 3000 (2)

3000 - 4000 (3)

> 4000 (4)

15. How many days in the last year the binocular microscope was not in a working condition?

< 15 (1)

15 - 30 (2)

30 - 45 (3)

> 45 (4)

16. Are there adequate supplies of reagents, slides and other consumables for the next one-month?

Yes (1)

No (2)

17. Who prepares the reagents, how are they prepared and where are they prepared?

18. Are reagents labeled?

Yes (1)

No (2)

19. How long are reagents used for?

One month (1)

Two months (2)

Three months (3)

20. Where do patients cough up their sputum specimens?

In open (1)

In closed room (2)

21. Does anyone observe them?

Yes (1)

No (2)

22. How are sputum containers labeled?

On the top of cup (1)

On the side of cup (2)

23. How many sputum specimens are collected for each TB suspect?

One (1)

Two (2)

Three (3)

24. How frequently slides are prepared?

Daily (1)

Bi-weekly (2)

- Weekly (3)
25. Who prepares the smears?
- Sweeper (1)
- Peon (2)
- Lab Tech (3)
26. Who stains them?
- Sweeper (1)
- Peon (2)
- Lab Tech (3)
27. How long does it take to examine a negative smear?
- < 1 minutes (1)
- 1 – 3 minutes (2)
- 3 – 5 minutes (3)
- > 5 minutes (4)
28. Do you have a smear examination form?
- Yes (1)
- No (2)
29. Who fills it in?
- Doctor (1)
- Pharmacist (2)
- Lab Tech (3)
30. Do you have an RNTCP laboratory register?
- Yes (1)
- No (2)
31. Who fills it in?
- Doctor (1)
- Pharmacist (2)
- Lab Tech (3)
32. Are slides kept for quality control after examination?
- Yes (1)
- No (2)
33. How do you preserve slides for review by STLS?

34. How often are slides sent for quality control?

Monthly (1)

Quarterly (2)

Yearly (3)

35. Has the laboratory received any feedback on quality of smear examination?

Yes (1)

No (2)

36. How the reports smear examination of referred cases from the PHI are conveyed?

37. What is the importance of 3 sputum exams for diagnosis and 2 sputum exams for follow up?

38. What is the schedule of sputum examination at intensive phase?

39. What is the schedule of sputum examination at continuation phase?

40. How the sputum cups, slides and infective material are disposed

QUESTIONNAIRE – STS

(CONFIDENTIAL)

We are interested in knowing what is situation of patients of Tuberculosis who have been placed on DOTS in district Bilaspur Himachal Pradesh. I will ask you some questions. Kindly spare five minutes and help us improve the services.

Data collection instrument for Senior Treatment Supervisor in the health facilities in district Bilaspur Himachal Pradesh.

I. Identification information

1. ID. No.

2. Name of DOTS provider _____

3. No. of service years in the district _____

4. Name of institution _____

5. Name of TU _____

6. Name of the DOTS centre _____

7. Area

Rural (1)

Urban (2)

II. Senior Treatment Supervisor

8. How do you confirm that sputum positive patient has been put on treatment?

9. How do you manage the contacts of sputum positives?

10. How often do you visit each DOT center in your TU area?

Weekly (1)

Monthly (2)

Quarterly (3)

Yearly (4)

11. What do you do to bring irregular patient/defaulters back on treatment?

Contact the contact person (1)

Inform MPW of the area (2)

Perform home visits (3)

All (4)

12. How often do you review patient treatment activities with Multi Purpose Worker ?

Weekly (1)

Monthly (2)

Quarterly (3)

Yearly (4)

13. How do you maintain details of your field activities?

Keeping record in file (1)

Keeping record in diary (2)

14. Details of the IEC activities done in the last one year?

15. Do you visit house of patient within one week of initiation of treatment?

Yes (1)

No (2)

16. What is the purpose of home visit?

17. Opinion on diagnostic delay.

I. Is delay a problem

II. Average length of delay

III. Likely reasons for delay ?

QUESTIONNAIRE – STLS

(CONFIDENTIAL)

We are interested in knowing what is situation of patients of Tuberculosis who have been placed on DOTS in district Bilaspur Himachal Pradesh. I will ask you some questions. Kindly spare five minutes and help us improve the services.

Data collection instrument for Senior Treatment Laboratory Supervisor in the health facilities in district Bilaspur Himachal Pradesh.

I. Identification information

1. ID. No.

2. Name of STLS _____

3. No. of service years in the district _____

4. Name of institution _____

5. Name of TU _____

6. Area

Rural (1)

Urban (2)

II. Senior Treatment Laboratory Supervisor

1. Are you trained in RNTCP?

Yes (1)

No (2)

2. When do you review the slides?

Weekly (1)

Monthly (2)

Quarterly (3)

Yearly (4)

3. What is adult OPD of your TU during last quarter?

4. How many suspected cases examined?
5. How many were sputum positive?
6. What is the positivity rate of your TU during last quarter?
7. How do you review the slides?
8. How do you maintain details of your field activities?
 Keeping record in file (1)
 Keeping record in diary (2)
9. What is your supervisory visit schedule?
10. How many DMCs are in your TU?
11. Any DMC without Lab Technician?
12. What is the smear positivity rate of your TU

QUESTIONNAIRE – DOTS PROVIDERS

(CONFIDENTIAL)

We are interested in knowing what is situation of patients of Tuberculosis who have been placed on DOTS in district Bilaspur Himachal Pradesh. I will ask you some questions. Kindly spare five minutes and help us improve the services.

Data collection instrument for DOTS provider in the public and private health facilities in district Bilaspur Himachal Pradesh.

I. Identification information

1. ID. No.

2. Name of DOT Provider _____

3. No. of service years in the district _____

4. Name of institution _____

5. Name of TU _____

6. Name of the DOTS centre _____

7. Area

Rural (1)

Urban (2)

8. What is the population covered by you?

No. of persons

No. of households

9. Have you been trained in TB case finding and treatment?

Yes (1)

No (2)

10. How often do you visit each household in a year?

11. What signs and symptoms and duration most often make you suspect TB in a patient and lead you to refer him/her for TB diagnosis?
12. How many KMs away is the TB clinic or Hospital where you refer patients for diagnosis?
13. Do you record somewhere that you have referred a patient for diagnosis?
14. How many chest symptomatic do you estimate you have referred for TB diagnosis?
15. Validate with record in the last month

In the last one month

In the last one year

16. If the patient refuses to go to the Primary Health Centre for TB diagnosis do you make sputum smears in the field and post them to your PHC diagnosis of TB?

Yes (1)

No (2)

17. How are you informed that you should initiate ambulatory chemotherapy for a TB patient?
18. How many TB patients do you currently provide ambulatory therapy to?
19. Any supervisory visit from the DTO or your supervisory officer relating to TB case finding and / or treatment?
20. Have you experienced any shortages or interruptions in drug supplies or logistics?

.....

.....

21. What do you think are the major problems you face in

Identifying TB suspects

In treating TB patients

22. Are patient wise drug boxes being marked and maintained for each patients?
23. Do patients receive every dose of drugs under direct observation in intensive phase?
24. Are patients receiving at least one dose a week under direct observation in continuation phase?
25. Are the facilities (Clean water, disposable cups, privacy) for DOTS are available?
26. Do the treatment cards being marked at the time of giving each dose?
27. Do the patients bringing back blister packs when they collect weekly drugs?
28. Do there consistency between no. of doses and treatment card and drug box?
29. Does the treatment observer make home visits to verify the address of patients?
30. Does the treatment observer make prompt home visits to bring irregular patients back on treatment?
31. Does the treatment observer know at what dose in intensive phase he is supposed to give the sputum container for follow up examination?
32. Opinion on diagnostic delay.
 - I. Is delay a problem?
 - II. Average length of delay.....
 - III. Likely reasons for delay.....

Check Lists

Discussion with MOTC

1. Does the MOTC conduct supervisory visits to all PHC' at least once every quarter?
() Yes () No
2. Is the MOTC aware of smear conversion rate reported for TU in the last quarter?
() Yes () No
3. Is the MOTC aware of cure rate reported for TU in the last quarter?
() Yes () No

Discussion with Medical Officer of DMC

4. Does the MOTC conduct supervisory visits to all PHC' at least once every quarter?
() Yes () No
5. Is the MOTC aware of smear conversion rate reported for TU in the last quarter?
() Yes () No
6. Is the MOTC aware of cure rate reported for TU in the last quarter?
() Yes () No
7. Is medical officer trained in RNTCP?
() Yes () No
8. Does the medical officer have a copy of any one of the following documents?
 1. Technical guidelines () Yes () No
 2. RNTCP at a glance () Yes () No
 3. Key facts and concept. () Yes () No
 4. Desk reference () Yes () No
9. Is the MO aware of no. of sputum smears examined per month in the MC and what proportion of them is positive in his MC?
10. Does the MO review patient's treatment activities with MPW on a weekly basis?
11. Does the MO visit irregular/defaulting patients to bring them back on the treatment?

Discussion with Senior Treatment Supervisor

12. Do the STS visit each Primary Health Centre, Community Health Centre and Hospital in the TU area at least once in a month on a systematic schedule?
13. Does the STS visits the homes of irregular patients to bring them back on treatment?
14. Do the STS review patient's treatment activities with MPWs on regular basis?

Discussion with Laboratory Technician

15. Do the STS maintain a diary recording the details of his field activities? (see evidence)

ANNEXURE-IX

Table 1. Sample size of NSP patients, provider and system participants recruited in study delay in diagnosis and treatment under RNTCP district Bilaspur Himachal Pradesh, India 2008.

Issues	Participant	Technique	Tool	Sampling frame	Sample size	Quality checks	Data collecting personnel
Patient issues	Adult NSP patients	Interview	1.Semi structured Questionnaire 2.Abstraction form	170 sputum positive cases of 1q08and2qo8	137	Scrutiny of forms at time of data entry	Principal investigator
Provider issues	Doctors	Interview	Interview schedule consisting of semi structured questionnaire	48 doctors of health facilities of Bilaspur district	41	Scrutiny of forms at time of data entry	Principal investigator
	Laboratory Technician	Interview	Interview schedule consisting of semi structured questionnaire	12 LTs of microscopy centers of Bilaspur district	12	Scrutiny of forms at time of data entry	Principal investigator
	DOTS Provider	Interview	Interview schedule consisting of semi structured questionnaire	222 DOTS providers providing DOTS to the study subjects	107	Scrutiny of forms at time of data entry	Principal investigator

Table 1(contd.) Sample size of NSP patients, provider and system participants recruited in study delay in diagnosis and treatment under RNTCP district Bilaspur Himachal Pradesh, India 2008.

Issues	Participant	Technique	Tool	Sampling frame	Sample size	Quality checks	Data collecting personnel
System issues	DTO	Interview	Interview schedule consisting of semi structured questionnaire	1	1	Scrutiny of forms at time of data entry	Principal investigator
	MOTC	Interview	Interview schedule consisting of semi structured questionnaire	2	2	Scrutiny of forms at time of data entry	Principal investigator
	LTs	Interview	Interview schedule consisting of semi structured questionnaire	12	12	Scrutiny of forms at time of data entry	Principal investigator
	STS	Interview	Interview schedule consisting of semi structured questionnaire	2	2	Scrutiny of forms at time of data entry	Principal investigator
	STLS	Interview	Interview schedule consisting of semi structured questionnaire	2	2	Scrutiny of forms at time of data entry	Principal investigator
	DOTS Providers	Interview Abstraction	1.Semi structured Questionnaire 2.Abstraction form	222	107	Scrutiny of forms at time of data entry	Principal investigator

Table 2 Descriptive characteristics of the study population (n=140)

Characteristic/variable		No.	%
Age group (years)	15-29	49	35.0
	30-44	33	23.6
	45-59	35	25.0
	>60	23	16.4
Gender	Male	100	72.0
	Female	40	28.0
Place of residence	Urban	11	7.9
	Rural	129	92.1
Marital status	Unmarried	31	22.1
	Married	97	69.3
	Widowed	12	8.6
	Divorced	0	0.0
Type of family	Joint	114	81.4
	Nuclear	26	18.6
Size of family	<3	13	9.3
	3-5	58	41.4
	≥6	69	49.3
Religion	Hindu	137	97.9
	Others	3	2.1
Caste*	SC	47	33.6
	OBC	13	9.3
	General	77	55.0
	Others	3	2.1
Qualification	Illiterate	32	22.9
	Primary	36	25.7
	Middle	26	18.6
	Matric	29	20.7
	Graduate	15	10.7
	Professional	2	1.4

* SC=Scheduled castes; OBC=Other backward castes

Table 2 (contd.): Descriptive characteristics of the study population (n=140)

Characteristic/variable		No.	%
Smoking habits	Yes	85	60.7
	No	55	39.3
Consumption of alcohol	Yes	80	57.1
	No	60	42.8
Income	0-500	1	0.70
	501-3000	51	36.4
	3001-6000	44	31.4
	6001-10000	26	18.6
	1001-50000	18	12.9
Place of living	Rented	10	7.1
	Own	130	92.9
Type of House	Kuccha	32	22.9
	Semi-pucca	38	27.1
	Pucca	69	49.3
	Bungalow	1	0.7
Occupation	Non-Salaried	56	40.0
	Salaried	84	60.0

Table 3: Knowledge about tuberculosis(n=140)

Variables		No	%
Heard of TB	Yes	136	97.1
	No	4	2.9
Is TB Hereditary	Yes	28	20.0
	No	112	80.0
Is Tb Contagious	Yes	128	91.4
	No	12	8.6
Knowledge of TB Vaccine	Yes	21	15.0
	No	119	85.0
Aware about duration of treatment	Yes	139	99.3
	No	1	0.7
What is cause of TB	TB Germs	26	18.6
	Lack of proper food	5	3.6
	Addiction to smoking/alcohol	22	15.7
	Over work	4	2.9
	worries	11	7.9
	God's curse	3	2.1
	Fate	14	10.0
	Poor Hygiene	2	1.4
Source of information	None	53	37.9
	Health department campaign	17	12.1
	TV	54	38.6
	Radio	7	5.0
	Print media	1	0.7
	TB disease amongst friends/relatives	39	27.9
	None	15	10.7
Others	7	5.0	

Table 3(contd). Perceived causes of delay among new smear positive patients (NSP) (n=140)

Perceived causes of delay	n=140	%
No delay	23	16.4
Poor knowledge of disease	28	20.0
Fear of what would be found	1	0.7
Hoped symptoms would go away	17	12.1
Fear of social isolation	1	0.7
Symptoms were mild	4	2.9
Distance of facility not convenient	3	2.1
Inadequate staff attitude	1	0.7
Others	62	44.3

Table 4 : Health Seeking Behavior(n=140)

Variables		No	%
Preference for Health Facility	Indifference to ailment	14	10.0
	Self-medication	5	3.6
	Pharmacy	41	29.3
	Native medicine	1	0.7
	Specialist care	1	0.7
	Govt. Health facility	67	47.9
	Others	11	7.9
HF 1st contacted	Government health facility	75	53.6
	Private health facility	36	25.7
	Traditional healer	4	2.9
	Drug store	20	14.3
	self medication	2	1.4
	others	3	2.1
Government Level	NA	65	46.4
	District Level	18	12.9
	Sub-district level	13	9.3
	Community health center	9	6.4
	Primary health center	15	10.7
	Civil Dispensary	4	2.9
	Health sub Center	4	2.9
	Ayurvedic hospital/Dispensary	11	7.9
	Others	1	0.7

Table 4 (contd): Health Seeking Behavior(n=140)

Variables		No	%
	NA	85	60.7
Private Praitioner's Level	Physician	7	5.0
	MBBS	8	5.7
	BAMS	10	7.1
	Others	30	21.4
	Easy accessibility	81	57.9
Reasons for choosing 1st HF	Confidence in getting cured	42	30.0
	Service available at any time	9	6.4
	Free services	1	0.7
	Advised by some body	3	2.1
	Others	4	2.9
	Distance b/w residence and microscopy center	> 5Km	91
≤5km		49	35%

Table 5 : Symptoms profile of TB Patients. (n=140)

Symptom		No	%
Cough	Yes	95	67.9
	No	45	32.1
Fever	Yes	111	79.3
	No	29	20.7
Haemoptysis	Yes	16	11.4
	No	124	88.6
Dyspnoea	Yes	11	7.9
	No	129	92.1
Weight loss	Yes	9	6.4
	No	131	93.6
Chest Pain	Yes	18	12.9
	No	122	87.1

Table 6 : Treatment histories of TB Patients(n=140)

Variables		No	%
NO. of consultations	>3	68	48.6
	≤3	72	51.4
Sputum examination prior to diagnostic specimen	Yes	28	20.0
	No	112	80.0
Chest radiography	Done	44	30.9
	Not done	96	69.1
Referral to consult this Health Facility	Referred by previous health provider consulted	33	23.6
	Self referral	75	53.6
	Family members/Relatives	22	15.7
	Advised by other TB patients	2	1.4
	Health worker	3	2.1
	Others	5	3.6
Reason for not choosing this HF earlier	Too Far	77	55.0
	Too Busy/Long waiting time	10	7.1
	Bad experience/bad attitude of staff	2	1.4
	Others	51	36.4

Table 7. Stigma component of TB Patients (n=140)

Stigma Component		No	%
Do you feel ashamed of having TB	No	98	70.0
	Can't Say	1	0.7
	Yes	41	29.3
Do you have to hide TB from others	No	87	62.1
	Can't Say	1	0.7
	Yes	52	37.1
Does TB affect relations	No	114	81.4
	Can't Say	1	0.7
	Yes	25	17.9
Does TB affect your work performance	No	57	40.7
	Can't Say	1	0.7
	Yes	82	58.6
Does TB affect marital relations	No	95	67.9
	Can't Say	20	14.3
	Yes	25	17.9
Does Tb affect family responsibilities	No	106	75.7
	Can't Say	2	1.4
	Yes	32	22.9
Do you think less chance of marriage due to TB	No	97	69.3
	Can't Say	11	7.9
	Yes	32	22.9

Table 7(contd): Stigma component of TB Patients (n=140)

Does TB affect your family relations	No	128	91.4
	Can't Say	2	1.4
	Yes	10	7.1
Does Tb lead to complications during pregnancy	No	33	23.6
	Can't Say	94	67.1
	Yes	13	9.3
Does TB affect breast feeding	No	53	37.9
	Can't Say	52	37.1
	Yes	35	25.0
Does Tb affect pregnancy outcome	No	20	14.3
	Can't Say	111	79.3
	Yes	9	6.4

Table 8. Mean and median delays among new smear positive patients (NSP) under DOTS During 1st January 2008 to 30th June 2008 in Bilaspur district Himachal Pradesh (n=140)

	No. of patients (%)	95% C.I.	No. of days		
			Mean \pm s.d	Median (I.Q.range)	Range
Patient delay	66 (47.1)	38.7-55.8	60.9 \pm 62.3	38.0 (17.0-85.0)	1-214
Provider/system delay	89 (63.6)	55.0-71.5	50.9 \pm 59.9	29.0 (11.0-68.0)	1-343
Total delay	140 (100.0)	97.4-100.0	92.6 \pm 83.6	62.5 (34.5-110.0)	2-355

Table 9: Frequency distribution of NSP patient interval* according to selected risk factors

Characteristics/Variable		n=140	%	Mean	Median	Standard Deviation	Range
Age	15-29	49	35.0	46.4	25.0	57.8	1-244
	30-44	33	23.0	46.8	24.0	57.8	1-244
	45-59	35	25.0	55.4	31.0	65.8	1-220
	>60	4	16.4	46.6	24.0	53.4	1-218
Sex	Male	100	71.4	52.0	29	60.0	0-244
	Female	40	28.6	40.0	19	55.0	1-244
Caste	General	77	55	46.1	31	52.0	1-233
	Others	63	63	52.1	24	66.2	1-244
Area	Urban	11	7.9	74.5	60	66.4	13-216
	Rural	129	92.1	46.6	24	57.7	1-244
Marital status	Married	97	69.3	49.1	23	62.9	1-244
	unmarried	31	22.1	49.4	32	52.7	2-233
	widowed	12	8.6	44.6	29.5	37.0	5-117
Type of family	Joint	114	81.4	50.3	30.5	57.6	1-244
	Nuclear	26	18.6	42.2	16.5	63.8	1-233
Size of family	≤3	13	9.3	77.3	69.0	58.3	9-190
	3-5	58	41.4	44.4	25.5	54.1	1-220
	5-7	35	25.0	51.3	21.0	68.3	1-244
	>7	34	24.3	42.7	21.0	54.7	1-244
Literacy	Illiterate	32	22.9	46.8	20.5	59.8	1-220
	Primary	36	25.7	49.3	22.5	64.2	1-244
	Middle	26	18.6	52.4	26.0	55.8	3-212
	Matric	29	20.7	40.2	31.0	41.5	2-188
	Graduate	15	10.7	68.4	38.0	77.8	2-244
	Post-graduate	2	1.4	3.5	3.5	0.70	3-4
Income of family	<1500	11	7.9	43.6	50.0	32.9	1-90
	1501-4500	54	38.6	57.2	29.0	67.8	1-244
	4501-10000	57	40.7	40.4	25.0	45.1	1-216
	>10000	18	12.9	53.5	10.5	77.2	2-244

* Interval: no. of days between onset of symptom to 1st contact with health facility.

Table 9 (contd): Frequency distribution of NSP patient interval* according to selected risk factors

Characteristics/Variable		n=140	%	Mean	Median	Standard Deviation	Range
Smoking	Yes	83	59.3	57.0	32.0	63.1	1-244
	No	57	40.7	36.8	17.0	49.6	1-244
Consumption of alcohol	Yes	63	45.0	52.7	31.0	59.5	1-233
	No	77	55.0	45.5	22.0	58.2	1-244
Distance b/w Microscopy center	≤5 km	47	33.6	49.3	27.0	58.0	1-244
	6-10 km	34	24.3	33.7	24.0	39.4	1-188
	11-20 km	36	25.7	55.8	29.5	65.3	2-233
	>20km	23	16.4	58.0	22.0	71.3	1-244
Duration of cough in days	≤21	48	34.3	28.8	17.0	37.8	1-216
	22-60	35	25.0	26.2	22.0	19.2	1-70
	61-180	43	30.7	58.3	66.0	51.1	1-220
	>180	14	10.0	144.2	189.0	96.4	2-244
Health Facility	Government	75	53.6	32.6	14.0	49.1	1-244
	Private	36	27.7	56.6	37.0	54.7	4-244
	Others	29	20.7	81.0	60.0	71.6	9-233

* Interval: no. of days between onset of symptom to 1st contact with health facility.

Table 10 : Frequency distribution of NSP TB patient delay* according to selected risk factors

Characteristics/variable		n=66	%	Mean	Median	Standard Deviation	Range
age	15-29	23	34.8	56.3	32.0	63.9	1-214
	30-44	15	22.7	60.8	40.0	60.7	2-214
	45-59	18	27.3	66.1	36.5	70.8	1-190
	≥60	10	15.2	62.6	48.5	52.4	8-188
Sex	Male	49	74.2	63.3	40.0	62.8	1-214
	Female	17	25.8	54.1	41.0	62.1	1-214
Caste	General	39	59.1	51.0	33.0	53.3	1-203
	Others	27	40.9	75.3	40.0	72.0	1-214
Area	Urban	7	10.6	77.1	62	62.6	14-186
	Rural	59	89.4	59.0	33	62.5	1-214
Marital status	unmarried	17	25.8	50.8	33.0	53.3	1-203
	Married	43	65.2	67.4	38.0	68.4	1-214
	Widowed/widower	6	9.1	43.3	40.6	31.3	1-87
Type of family	Joint	57	86.4	59.1	39.0	59.8	1-214
	Nuclear	9	13.6	72.8	30.0	79.3	2-203
Size of family	<3	10	15.2	64.8	53.0	55.2	1-160
	3-5	26	39.4	55.5	32.5	58.4	2-190
	6-7	16	24.2	70.0	35.5	76.6	2-214
	>7	14	21.2	58.0	36.5	61.5	1-214
Literacy	Illiterate	13	19.7	68.5	41.0	65.3	2-190
	Primary	14	21.2	78.6	49.5	69.8	6-214
	Middle	13	19.7	61.3	40.0	56.3	1-182
	Matric	16	24.2	34.3	19.0	42.4	1-158
	Graduate	10	15.2	69.4	35.5	78.8	1-214

* Delay: no. of days in excess of thirty days from onset of first symptom to 1st contact with health facility.

Table 10(contd): Frequency distribution of NSP TB patient delay* according to selected risk factors

Characteristics/variable	n=66	%	Mean	Median	Standard Deviation	Range	Characteristics/variable
Income of family	<1500	6	9.1	39.8	36.5	15.6	20-60
	1501-4500	27	40.9	72.1	39.0	71.6	1-214
	4501-10000	26	39.4	44.6	31.5	47.3	1-186
	>10000	7	10.6	96.5	70.0	81.6	14-214
Smoking	Yes	46	55.4	56.7	32.0	62.2	1-244
	No	20	35.0	35.0	14.0	50.4	1-244
Consumption of alcohol	Yes	32	48.5	62.2	45.5	61.2	1-203
	No	34	51.5	59.8	32.5	64.2	1-214
Distance b/w residence and microscopy	≤5 km	22	33.3	63.2	41.0	59.7	1-214
	6-10 km	15	22.7	33.8	30.0	42.8	1-158
	11-20 km	18	27.3	69.5	44.0	68.5	1-203
	>20km	11	16.7	79.3	43.0	74.7	1-214
Duration of cough in days	≤21	16	24.2	35.3	19.0	47.1	2-186
	22-60	13	19.7	17.0	14.0	13.6	1-40
	61-180	26	39.4	60.4	52.0	40.7	1-190
	>180	11	16.7	151.5	163.0	70.4	1-214
Health Facility first contacted	Government	24	36.4	52.6	31.0	61.7	1-214
	Private	22	33.3	52.3	31.5	56.1	1-214
	Others	20	30.3	80.4	43.0	67.9	2-203

* Delay: no. of days in excess of thirty days from onset of first symptom to 1st contact with health facility.

Table 11 : Frequency distribution of provider delay* in diagnosis of TB according to selected risk factors.

Characteristics/variable		N=89	%	Mean	Median	Standard Deviation	Range
Age (years)	15-29	31	34.8	38.7	30	32.1	1-127
	30-44	20	22.5	68.4	23	81.1	2-263
	45-59	22	24.7	45.2	29	36.0	5-136
	≥60	16	18.0	60.5	29	89.4	1-343
Sex	Male	58	65.2	44.0	27.0	74.7	2-343
	Female	31	34.8	63.8	40.0	49.6	1-214
Caste	General	43	48.3	39.4	29.0	39.1	1-185
	Others	46	51.7	61.6	28.5	73.1	1-343
Area	Urban	6	6.7	24.3	13.0	32.1	2-87
	Rural	83	93.3	52.8	32.0	61.1	1-343
Marital status	Married	62	69.7	47.9	28.5	51.4	2-263
	unmarried	27	30.3	57.7	29.0	76.7	1-343
Type of family	Joint	72	63.1	52.0	27.0	64.5	1-343
	Nuclear	17	65.3	46.3	40.0	35.0	4-105
Size of family	<3	8	9.0	53.2	59.0	43.6	2-113
	3-5	35	39.3	61.4	27.0	79.5	1-343
	6-7	24	27.0	42.7	33.0	39.7	1-136
	>7	22	24.7	42.2	24.0	45.7	3-185
Income of family	0-5000	52	58.4	48.1	28.5	57.9	1-263
	5001-10000	25	28.1	49.8	29.0	44.8	2-185
	10001-20000	10	11.2	75.0	58.0	98.8	1-343
	20001-40000	2	2.2	16.5	16.5	2.12	15-18
Smoking	Yes	49	55.1	43.5	27.0	62.2	1-263
	No	40	44.9	59.9	35.0	50.4	1-343

* Delay: no. of days in excess of seven days from first contact with health facility.

Table 12(contd.): Frequency distribution of provider delay* in diagnosis of TB according to selected risk factors.

Characteristics/variable		n=89	%	Mean	Median	Standard Deviation	Range
Consumption of alcohol	Yes	35	55.5	44.6	24.0	55.4	2-263
	No	54	70.1	54.9	35.0	62.8	1-343
Distance b/w residence and microscopy	0-10	51	57.3	53.4	30.0	66.0	1-343
	11-20	22	24.7	50.2	38.0	54.2	1-239
	21-30	30	14.6	46.3	19.0	53.5	2-185
	31-40	40	3.4	32.6	37.0	10.2	21-40
Duration of cough in days	≤21	30	33.7	32.9	23.5	38.4	1-175
	22-60	23	25.8	36.5	21.0	51.1	1-239
	61-180	27	30.3	66.9	74.0	46.2	2-185
	>180	9	10.1	99.6	37.0	121.1	3-343
Health Facility	Government	52	58.4	59.7	35.0	66.1	1-343
	Private	21	23.6	32.7	24.0	31.6	1-113
	Others	6	18.0	46.0	32.0	63.9	2-263

* Delay: no. of days in excess of seven days from first contact with health facility.

Table 13. Description of patient interval by age groups, NSP TB cases, district Bilaspur, Himachal Pradesh ,India, 2008

Age group	Patient interval																	
	<15 days		16-30days		31-60 days		61-90 days		91-120 days		121-150 days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
15-29	19	38.8	7	14.3	11	22.4	6	12.2	1	2	1	2	1	2	3	6.1	49	35.0
30-44	14	42.4	4	12.1	5	15.2	4	12.1	4	12.1	0	0	0	0	2	6.1	33	23.5
45-59	11	31.4	6	17.1	9	25.7	2	5.7	1	2.9	1	2.9	0	0	5	14.3	35	25.0
>60	9	39.1	4	17.4	4	17.4	2	8.7	2	8.7	1	4.3	0	0	1	4.3	23	16.4
TOTAL	53	37.9	21	15	29	20.7	14	100	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 13.1. Description of patient interval by sex, NSP TB cases, district Bilaspur, Himachal Pradesh, India, 2008

Sex	Patient interval																	
	<15 days		16-30days		31-60 days		61-90 days		91-120 days		121-150 days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Female	19	47.5	4	10	9	22.5	5	12.5	0	0	0	0	0	0	3	7.5	40	28.5
Male	34	34	17	17	20	20	9	9	8	8	3	3	1	1	8	8	100	71.4
TOTAL	53	37.9	21	15	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 13.2 Description of patient interval by place of residence (rural. Urban), NSP TB cases, district Bilaspur, Himachal Pradesh ,India, 2008

Area	Patient interval																	
	<15 days		16-30days		31-60 days		61-90 days		91-120 days		121-150 days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Rural	50	38.8	20	15.5	27	20.9	13	10.1	6	4.7	3	2.3	0	0	10	7.8	129	92.1
Urban	3	27.3	1	9.1	2	18.2	1	9.1	2	18.2	0	0	1	9.1	1	9.1	11	7.8
TOTAL	53	37.9	21	15	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 13.3 Description of patient interval by place of residence (rural. Urban), NSP TB cases, district Bilaspur, Himachal Pradesh ,India, 2008

Caste	Patient interval																	
	<15 days		16-30days		31-60 days		61-90 days		91-120 days		121-150 days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Scheduled Caste	17	36.2	9	19.1	6	12.8	5	10.6	1	2.1	1	2.1	1	2.1	7	14.9	47	33.6
Scheduled Tribe	6	46.2	3	23.1	2	15.4	1	7.7	1	7.7	0	0	0	0	0	0	13	9.3
General	30	37.5	9	11.3	22	27.5	8	10	5	6.3	2	2.5	0	0	4	5	80	57.1
TOTAL	53	37.9	21	15	30	21.4	14	10	7	5	3	2.1	1	0.7	11	7.9	140	100

Table 13.4 Description of patient interval by marital status, NSP TB cases, district Bilaspur, Himachal Pradesh ,India, 2008

Marital Status	Patient interval																	
	<15 days		16-30 days		31-60 days		61-90 days		91-120 days		121-150 days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Unmarried	12	38.7	2	6.5	8	25.8	4	12.9	2	6.5	1	3.2	1	3.2	1	3.2	31	22.1
Married	38	39.2	16	16.5	19	19.6	8	8.2	4	4.1	2	2.1	0	0	10	10.3	97	69.3
Widowed/Widower	3	25	3	25	2	16.7	2	16.7	2	16.7	0	0	0	0	0	0	12	8.6
TOTAL	53	37.9	21	15	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 13.5 Description of patient interval by type of family, NSP TB cases, district Bilaspur, Himachal Pradesh ,India, 2008

Type of family	Patient interval																	
	<15 days		16-30 days		31-60 days		61-90 days		91-120 days		121-150 days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Joint	41	36	16	14	23	20.	14	12.3	8	7	3	2.6	0	0	9	7.9	114	81.4
Nuclear	12	46.2	5	19.2	6	23.1	0	0	0	0	0	0	1	3.8	2	7.7	26	18.6
TOTAL	53	37.9	21	15	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 13.6 Description of patient interval by size of family, NSP TB cases, district Bilaspur, Himachal Pradesh ,India, 2008

Size of family	Patient interval																	
	<15 days		16-30days		31-60 days		61-90 days		91-120 days		121-150 days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<3	1	7.7	2	15.4	3	23.1	2	15.4	3	23.1	0	0	0	0	2	15.4	13	9.3
3-5	24	41.4	8	13.8	12	20.7	7	12.1	2	3.4	1	1.	0	0	4	6.9	58	41.4
6-7	15	42.9	4	11.4	7	20	3	8.6	2	5.7	0	0	0	0	4	11.4	35	25
>7	13	38.2	7	20.6	7	20.6	2	5.9	1	2.9	2	5.9	1	2.9	1	2.9	34	24.3
TOTAL	53	37.9	21	15	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 13.7 Description of patient interval by literacy, NSP TB cases, district Bilaspur, Himachal Pradesh ,India, 2008

Literacy	Patient interval																	
	<15 days		16-30days		31-60 days		61-90 days		91-120 days		121-150 days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Illiterate	15	46.9	4	12.5	5	15.6	2	6.3	3	9.4	0	0	0	0	3	9.4	32	22.9
Primary	15	41.7	7	19.4	5	13.9	3	8.3	1	2.8	1	2.8	1	2.8	3	8.3	36	25.7
Middle	6	23.1	7	26.9	5	19.2	3	11.5	2	7.7	1	3.8	0	0	2	7.7	26	18.6
Matric	10	34.5	3	10.3	10	34.5	3	10.3	2	6.9	0	0	0	0	1	3.4	29	20.7
Graduate	5	33.3	0	0	4	26.7	3	20	0	0	1	6.7	0	0	2	13.3	15	10.7
Postgraduate	2	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1.4
TOTAL	53	37.9	21	15	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 13.8 Description of patient interval by income group, NSP TB cases, district Bilaspur, Himachal Pradesh ,India, 2008

Income groups	Patient interval																	
	<15 days		16-30 days		31-60 days		61-90 days		91-120 days		121-150 days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<1500	3	27.3	2	18.2	2	18.2	4	36.4	0	0	0	0	0	0	0	0	11	7.9
1501-4500	18	33.3	9	16.7	12	22.2	3	5.6	4	7.4	0	0	1	1.9	7	13	54	38.6
4501-10000	22	38.6	9	15.8	13	22.8	6	10.5	3	5.3	2	3.5	0	0	2	3.5	57	40.7
10001-20000	10	71.4	1	7.1	0	0	1	7.1	0	0	1	7.1	0	0	1	7.1	14	10.0
>20001	0	0	0	0	2	50	0	0	1	25	0	0	0	0	1	25	4	2.9
TOTAL	53	37.9	21	15	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 13.9 Description of patient interval by smoking habits, NSP TB cases, district Bilaspur, Himachal Pradesh ,India, 2008

Smoking	Patient interval																	
	<15 days		16-30days		31-60 days		61-90 days		91-120 days		121-150days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	24	28.2	14	16.5	20	23.5	8	9.4	8	9.4	2	2.4	1	1.2	8	9.4	85	60.7
No	29	52.7	7	12.7	9	16.4	6	10.9	0	0	1	1.8	0	0	3	5.5	55	39.3
TOTAL	53	37.9	21	15	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 13.10 Description of patient interval by consumption of alcohol, NSP TB cases, district Bilaspur, Himachal Pradesh, India, 2008

Consumption of Alcohol	Patient interval																	
	<15 days		16-30days		31-60 days		61-90 days		91-120 days		121-150days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	21	33.3	10	15.9	13	20.6	5	7.9	6	9.5	2	3.2	1	1.6	5	7.9	63	45
No	32	41.6	11	14.3	16	20.8	9	11.7	2	2.6	1	1.3	0	0	6	7.8	77	55
TOTAL	53	37.9	21	15	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 13.11 Description of patient interval by distance b/w residence & microscopy center, NSP TB cases, district Bilaspur, Himachal Pradesh ,India, 2008

Distance b/w residence & microscopy center	Patient interval																	
	<15 days		16-30days		31-60 days		61-90 days		91-120 days		121-150days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
≤ 5km	15	31.9	10	21.3	8	17	5	10.6	4	8.5	1	2.1	1	2.1	3	6.4	47	33.6
6-10km	23	41.1	6	10.7	15	26.8	5	8.9	2	3.6	2	3.6	0	0	3	5.4	56	40
11-20km	13	40.6	4	12.5	5	15.6	4	12.5	2	6.3	0	0	0	0	4	12.5	32	22.9
>20 km	2	40	1	20	1	20.0	0	0	0	0	0	0	0	0	1	20	5	3.6
TOTAL	53	37.9	21	15	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 13.12 Description of patient interval by health facility 1st contacted, NSP TB cases, district Bilaspur, Himachal Pradesh, India, 2008

Health facility first contacted	Patient interval																	
	<15 days		16-30days		31-60 days		61-90 days		91-120 days		121-150days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Government	40	53.3	11	14.7	12	16	6	8	1	1.3	2	2.7	0	0	3	4	75	53.6
Private	7	19.4	7	19.4	11	30.6	3	8.3	5	13.9	0	0	1	2.8	2	5.6	36	25.7
Traditional healer	1	25	2	50	0	0	1	25	0	0	0	0	0	0	0	0	4	2.9
Drug store	4	20	0	0	5	25	4	20	2	10	1	5	0	0	4	20	20	14.3
Self medication	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	100	2	1.4
Others	1	33.3	1	33.3	1	33.3	0	0	0	0	0	0	0	0	0	0	3	2.1
TOTAL	53	37.9	21	15	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 13.13 Description of patient interval by duration of cough, NSP TB cases, district Bilaspur, Himachal Pradesh ,India, 2008

Cough duration	Patient interval																	
	<15 days		16-30 days		31-60 days		61-90 days		91-120 days		121-150days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
≤3 weeks	22	45.8	10	20.8	11	22.9	2	4.2	1	2.1	1	2.1	0	0	1	2.1	48	34.3
>3 weeks	31	33.7	11	12	18	19.6	12	13	7	7.6	2	2.2	1	1.1	10	10.9	92	65.7
TOTAL	53	37.9	21	15	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 14 Description of Patient delays by age group, NSP TB cases, district Bilaspur, Himachal Pradesh ,India, 2008

Age group (years)	No delay		Delay													
	0-30 days		31-60 days		60-90 days		91-120 days		121-150 days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
15-29	26	53.1	11	22.4	6	12.2	1	2	1	2	1	2	3	6.1	49	35.0
30-44	18	54.5	5	15.2	4	12.1	4	12.1	0	0	0	0	2	6.1	33	23.6
45-59	17	48.6	9	25.7	2	5.7	1	2.9	1	2.9	0	0	5	14.3	35	25.0
≥60	13	56.5	4	17.4	2	8.7	2	8.7	1	4.3	0	0	1	4.3	23	16.4
TOTAL	74	52.9	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 14.1 Description of Patient delays by sex, NSP TB cases, district Bilaspur, Himachal Pradesh ,India, 2008

Sex	No delay		Delay												TOTAL	
	0-30 days		31-60 days		36-90 days		91-120 days		121-150 days		151-180 days		>180 days			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Female	23	57.5	9	22.5	5	12.5	0	0	0	0	0	0	3	7.5	40	28.6
Male	51	51	20	20	9	9	8	8	3	3	1	1	8	8	100	71.4
TOTAL	74	52.9	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 14.2 Description of Patient delays by place of residence, NSP TB cases, district Bilaspur, Himachal Pradesh, India, 2008

Area	No delay		Delay													
	0-30 days		31-60 days		36-90 days		91-120 days		121-150 days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Rural	70	54.3	27	20.9	13	10.1	6	4.7	3	2.3	0	0	10	7.8	129	92.1
Urban	4	36.4	2	18.2	1	9.1	2	18.2	0	0	1	9.1	1	9.1	11	7.9
TOTAL	74	52.9	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 14.3 Description of Patient delays by caste, NSP TB cases, district Bilaspur, Himachal Pradesh ,India, 2008

Caste	No delay		Delay													
	0-30 days		31-60 days		36-90 days		91-120 days		121-150 days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
SC	26	55.3	6	12.8	5	10.6	1	2.1	1	2.1	1	2.1	7	14.9	47	33.6
OBC	9	69.2	2	15.4	1	7.7	1	7.7	0	0	0	0	0	0	13	9.3
General	39	48.8	22	27.5	8	10	5	6.3	2	2.5	0	0	4	5	80	57.1
TOTAL	74	52.9	30	21.4	14	10	7	5	3	2.1	1	0.7	11	7.9	140	100.0

Table 14.4 Description of Patient delays by marital status, NSP TB cases, district Bilaspur, Himachal Pradesh ,India, 2008

Marital Status	No delay		Delay													
	0-30 days		31-60 days		36-90 days		91-120 days		121-150 days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Unmarried	14	45.2	8	25.8	4	12.9	2	6.5	1	3.2	1	3.2	1	3.2	31	22.1
Married	54	55.7	19	19.6	8	8.2	4	4.1	2	2.1	0	0	10	10.3	97	69.3
Widowed	6	50	2	16.7	2	16.7	2	16.7	0	0	0	0	0	0	12	8.6
TOTAL	74	52.9	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 14.5 Description of Patient delays by type of family, NSP TB cases, district Bilaspur, Himachal Pradesh, India, 2008

Type of family	No delay		Delay													
	0-30 days		31-60 days		36-90 days		91-120 days		121-150 days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Joint	57	50	23	20.2	14	12.3	8	7	3	2.6	0	0	9	7.9	114	81.4
Nuclear	17	65.4	6	23.1	0	0	0	0	0	0	1	3.8	2	7.7	26	18.6
TOTAL	74	52.9	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 14.6 Description of Patient delays by size of family, NSP TB cases, district Bilaspur, Himachal Pradesh ,India, 2008

Size of family	No delay		Delay												TOTAL	
	0-30 days		31-60 days		36-90 days		91-120 days		121-150 days		151-180 days		>180 days		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
<3	3	23.1	3	23.1	2	15.4	3	23.1	0	0	0	0	2	15.4	13	9.3
3-5	32	55.2	12	20.7	7	12.1	2	3.4	1	1.7	0	0	4	6.9	58	41.4
6-7	19	54.3	7	20	3	8.6	2	5.7	0	0	0	0	4	11.4	35	25
>7	20	58.8	7	20.6	2	5.9	1	2.9	2	5.9	1	2.9	1	2.9	34	24.3
TOTAL	74	52.9	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 14.7 Description of Patient delays by literacy, NSP TB cases, district Bilaspur, Himachal Pradesh ,India, 2008

literacy	No delay		Delay													
	0-30 days		31-60 days		60-90 days		91-120 days		121-150 days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Illiterate	19	59.4	5	15.6	2	6.3	3	9.4	0	0	0	0	3	9.4	32	22.9
Primary	22	61.1	5	13.9	3	8.3	1	2.8	1	2.8	1	2.8	3	8.3	36	25.7
Middle	13	50	5	19.2	3	11.5	2	7.7	1	3.8	0	0	2	7.7	26	18.6
Matric	13	44.8	10	34.5	3	10.3	2	6.9	0	0	0	0	1	3.4	29	20.7
Graduate	5	33.3	4	26.7	3	20	0	0	1	6.7	0	0	2	13.3	15	10.7
Postgraduate	2	100	0	0	0	0	0	0	0	0	0	0	0	0	2	1.4
TOTAL	74	52.9	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 14.8 Description of Patient delays by income, NSP TB cases, district Bilaspur, Himachal Pradesh ,India, 2008

Income	No delay		Delay													
	0-30 days		31-60 days		36-90 days		91-120 days		121-150 days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<1500	5	45.5	2	18.2	4	36.4	0	0	0	0	0	0	0	0	11	7.9
1501-4500	27	50	12	22.2	3	5.6	4	7.4	0	0	1	1.9	7	13	54	38.6
4501-10000	31	54.4	13	22.8	6	10.5	3	5.3	2	3.5	0	0	2	3.5	57	40.7
10001-20000	11	78.6	0	0	1	7.1	0	0	1	7.1	0	0	1	7.1	14	10
>20001	0	0	2	50	0	0	1	25	0	0	0	0	1	25	4	2.9
TOTAL	74	52.9	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 14.9 Description of Patient delays by smoking habits, NSP TB cases, district Bilaspur, Himachal Pradesh ,India, 2008

Smoking	No delay		Delay													
	0-30 days		31-60 days		36-90 days		91-120 days		121-150 days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	38	44.7	20	23.5	8	9.4	8	9.4	2	2.4	1	1.2	8	9.4	85	60.7
No	36	65.5	9	16.4	6	10.9	0	0	1	1.8	0	0	3	5.5	55	39.3
TOTAL	74	52.9	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 14.10 Description of Patient delays by consumption of alcohol, NSP TB cases, district Bilaspur, Himachal Pradesh, India, 2008

Consumption of Alcohol	No delay		Delay													
	0-30 days		31-60 days		36-90 days		91-120 days		121-150 days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	31	49.2	13	20.6	5	7.9	6	9.5	2	3.2	1	1.6	5	7.9	63	45
No	43	55.8	16	20.8	9	11.7	2	2.6	1	1.3	0	0	6	7.8	77	55
TOTAL	74	52.9	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 14.11 Description of Patient delays by distance b/w residence & Microscopy center, NSP TB cases, district Bilaspur, Himachal Pradesh ,India, 2008

Distance b/w residence & Microscopy center	No delay		Delay												TOTAL	
	0-30 days		31-60 days		36-90 days		91-120 days		121-150 days		151-180 days		>180 days		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
≤ 5km	25	53.2	8	17	5	10.6	4	8.5	1	2.1	1	2.1	3	6.4	47	33.6
6-10km	29	51.8	15	26.8	5	8.9	2	3.6	2	3.6	0	0	3	5.4	56	40
11-20km	17	53.1	5	15.6	4	12.5	2	6.3	0	0	0	0	4	12.5	32	22.9
>20 km	3	60	1	20	0	0	0	0	0	0	0	0	1	20	5	3.6
TOTAL	74	52.9	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 14.12 Description of Patient delays by Health facility 1st contacted, NSP TB cases, district Bilaspur, Himachal Pradesh, India, 2008

Health facility 1 st contacted	No delay		Delay												TOTAL	
	0-30 days		31-60 days		36-90 days		91-120 days		121-150 days		150-180 days		>180 days		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Government	51	68	12	16	6	8	1	1.3	2	2.7	0	0	3	4	75	53.6
Private	14	38.9	11	30.6	3	8.3	5	13.9	0	0	1	2.8	2	5.6	36	25.7
Traditional healer	3	7.5	0	0	1	2.5	0	0	0	0	0	0	0	0	4	2.9
Drug store	4	20	5	25	4	20	2	10	1	5	0	0	4	20	20	14.3
Self medication	0	0	0	0	0	0	0	0	0	0	0	0	2	100	2	1.4
Others	2	66.7	1	33.3	0	0	0	0	0	0	0	0	0	0	3	2.1
TOTAL	74	52.9	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 14.13 Description of Patient delays by duration of Cough, NSP TB cases, district Bilaspur, Himachal Pradesh, India, 2008

Duration of Cough	No delay		Delay													
	0-30 days		31-60 days		36-90 days		91-120 days		121-150 days		151-180 days		>180 days		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
≤ 3 weeks	32	66.7	11	22.9	2	4.2	1	2.1	1	2.1	0	0	1	2.1	48	34.3
> 3 weeks	42	45.7	18	19.6	12	13	7	7.6	2	2.2	1	1.1	10	10.9	92	65.7
TOTAL	74	52.9	29	20.7	14	10	8	5.7	3	2.1	1	0.7	11	7.9	140	100.0

Table 15 Risk factors for patient delay found significant in analysis among NSP patients under DOTS in Bilaspur district Himachal Pradesh.2008

Risk factor		Total	Patient delay		Median patient delay (days)	χ^2 *	df	p-value *
			n =66	%				
Size of family	<3	71	52	73.2	32.0	37.28	1	0.001
	3-5	69	14	20.2	36.5			
Smoking habits	Yes	85	47	55.2	41.0	4.97	1	0.01
	No	55	19	34.5	32.0			
Duration of cough	≤3weeks	48	16	33.3	19.0	4.78	1	0.02
	>3weeks	92	50	54.3	42.0			
HF first contacted	Government health facility	75	24	32.0	31.0	15.26	2	0.001
	Private health facility	36	22	61.1	31.0			
	others	29	20	68.9	43.0			
Level of Government Health facility	Primary health center	48	16	33.3	19.0	9.30	1	0.002
	others	92	50	54.3	42.0			

p-value calculated by chi-square test/Fisher's exact test or T-statistic as applicable

Table 16. Risk factors for patient delay not found to be significant in analysis among NSP patients under DOTS in Bilaspur district Himachal Pradesh. 2008

Risk factor	Total	Patient delay		Median patient delay (days)	χ^2 *	df	p-value *	
		n =66	%					
Age	≤45	84	39	46.4	33.0	0.0	1	0.9
	>45	56	27	48.2				
Gender	Male	100	49	49.0	40.0	0.26	1	0.6
	Female	40	17	42.0				
Caste	General	77	39	50.6	33.0	0.56	1	0.4
	Others	63	27	42.8				
Literacy	Illiterate	32	13	40.6	41.0	0.41	1	0.5
	Literate	108	53	49.0				
Place of residence	Urban	11	7	63.6	62.0	0.68	1	0.4
	Rural	129	59	45.7				
Income	<5000	82	44	53.6	36.0	2.77	1	0.09
	>5000	58	22	37.9				
Occupation	Non-Salaried	56	27	48.2	30.0	0.00	1	0.9
	Salaried	84	39	46.4				
Marital status	Unmarried	43	23	53.4	38.0	0.67	1	0.4
	Married	97	43	44.3				
Type of family	Joint	114	57	50.0	39.0	1.44	1	0.2
	Nuclear	26	9	34.6				
Type of House	Kuccha	32	14	43.7	75.0	0.06	1	0.6
	Pucca	108	52	48.1				
Consumption of alcohol	Yes	63	32	50.7	45.5	0.38	1	0.54
	No	77	34	44.1				
Distance to Microscopy center	<5km	47	22	46.8	41.0	0.02	1	0.9
	>5km	93	44	47.3				

p-value calculated by chi-square test/Fisher's exact test or T-statistic as applicable

Table 17. Risk factors for Providers delay found significant in analysis among NSP patients under DOTS in Bilaspur district Himachal Pradesh.2008

Risk factor		Total	Provider delay		Median provider delay(days)	χ^2 *	df	p-value *
			n=89	%				
Gender	Male	100	58	58.0	27.0	3.89	1	0.03
	Female	40	31	77.5	40.0			
Caste	General	77	43	55.8	29.0	3.70	1	0.05
	Others	63	46	73.0	28.0			
Occupation	Non-Salaried	56	44	78.5	27	8.02	1	0.002
	Salaried	84	45	53.5	33			
Size of family	<3	71	67	94.3	32.0	56.32	1	0.001
	3-5	69	22	31.8	24.5			
Smoking habits	Yes	85	48	56.5	26.0	3.96	1	0.04
	No	55	41	74.5	40.0			
Level of Government Health facility	Primary health cent	15	14	93.3	33.0	5.067	1	0.02
	others	125	75	60.0	27.0			
Sputum examination Prior to diagnosis	Yes	28	13	46.4	19.0	4.31	1	0.05
	No	112	76	67.9	33.0			

p-value calculated by chi-square test/Fisher's exact test or T-statistic as applicable

Table 18. Risk factors for Providers delay not found to be significant among NSP patients under DOTS in Bilaspur district Himachal Pradesh.2008

Risk factor	Total	Provider delay		Median provider delay(days)	χ^2 *	df	p-value*	
		n=89	%					
Age	≤45	84	52	61.9	28.0	0.10	1	0.9
	>45	56	37	66.0				
Literacy	Illiterate	32	24	75.0	38.5	1.74	1	0.1
	Literate	108	65	60.1				
Place of residence	Urban	11	6	54.5	13.0	0.10	1	0.5
	Rural	129	83	64.3				
Income	<5000	82	52	63.4	28.5	0.02	1	0.9
	>5000	58	37	63.7				
Marital status	Unmarried	43	27	62.7	29.0	0.00	1	0.8
	Married	97	62	63.9				
Type of family	Joint	114	72	63.1	27.0	0.00	1	0.8
	Nuclear	26	17	65.3				
Type of House	Kuccha	32	24	75.0	36.5	2.34	1	0.12
	Pucca	108	65	60.1				
Consumption of alcohol	Yes	63	35	55.5	24.0	2.58	1	0.10
	No	77	54	70.1				
Distance to Microscopy center	≤5km	47	27	57.4	19.0	0.78	1	0.2
	>5km	93	62	66.6				
HF first contacted	Government health facility	75	52	69.3	35.0	2.39	2	0.3
	Private health facility	36	21	58.3				
	others	29	16	55.1				
Duration of cough	≤3weeks	48	30	62.5	23.5	0.00	1	0.8
	>3weeks	92	59	64.1				

p-value calculated by chi-square test/Fisher's exact test or T-statistic as applicable