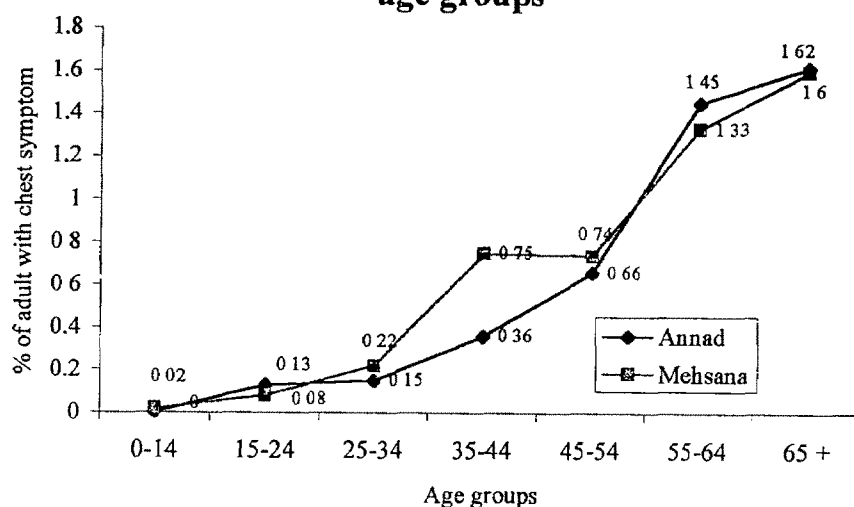# Chapter 6 - Discussion

A Revised National Tuberculosis Control Programme (RNTCP) based on WHO strategy was implemented in India in 1993. The rural model of RNTCP was tested on pilot basis at Mehsana district in Gujarat state. This was the first study conducted to evaluate the impact of RNTCP in Mehsana.

6.1 Prevalence of chest symptomatics:

In present study the patient, who was having a complain of cough with expectoration for more than 3 weeks in past 3 months and not taken TB treatment was defined as a chest symptomatic. The prevalence of chest symptomatic patient in a community-based survey was observed 0.57% and 0.55% in Mehsana and Anand respectively (Table 5.1.1). The age specific prevalence of chest symptomatic increased with age in both the districts and was having a similar pattern as shown in Figure 6.1

Figure 6.1
Percent of adult with chest symptoms by age groups

Various study showed the prevalence of cough in the community with the range of 1% to 12% (Narayan 1976, Krishnaswamy 1977, Subramaniam 1990, Nair 1999). The variation could be because of different criteria and timing of study. However what was common in these studies and seen in our study also was increasing prevalence of symptoms with increasing age. The trend of increasing prevalence of chest symptom by age could be due to cumulative increase in prevalence of tuberculosis.

6.2 Health seeking behavior of chest symptomatic:

The health seeking behavior of patient was dynamic and culture sensitive. Several factors shape the behavior.

6.2.1 Knowledge and attitude toward the TB:

The knowledge regarding cough as a symptom of tuberculosis was present in 84.3% (86/102) in Mehsana and 84.4% (105/125) in Anand. The difference was statistically not significant. (Table 5.1.14)

A survey of household at Pune district (Upleker 1996) found that there was reasonable awareness of disease, when the main symptom of TB was enumerated by 55% of rural respondents. Gujarat (Anand & Mehsana) had better knowledge and awareness towards TB as compared to Pune study. This may be explained with difference in socio-economic status of patients, their access to information about the disease, the diagnostic and treatment facility available to the area. The information to chest symptomatic came from personal experience and the community, more than the media and health services.

6.2.2 Cultural belief:

To our question- "*Is TB curable*?" a large majority (74.4%-80.4%) of chest symptomatic patients mentioned that indeed it is a curable disease now (Table 5.1.16,and Figure 6.2). The source of information ware multiple and mainly came from treating doctors

(41/82) and the health workers (34/82) in Mehsana while relatives and friends (49/92), treating doctors (41/92), and health workers (15/93) in Anand (Table 5.1.16). It showed that involvement of health workers was significantly low in Anand as compared to Mehsana.
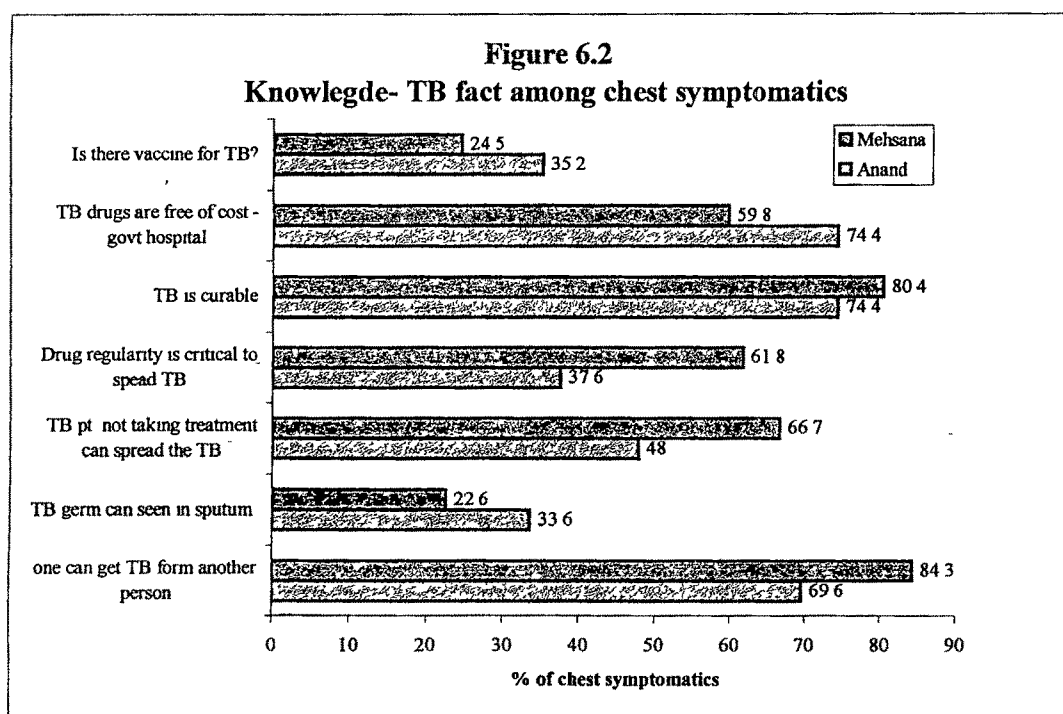
66.7% (68/102) in Mehsana and 48% (60/125) in Anand, the chest symptomatic reported that they were aware of the fact "*A TB patient, who is not taking treatment cough or sneeze than he can spread the disease*". The treating doctors were the main source of knowledge in both the districts (Table 5.1.17). While health workers were a poor source of knowledge in Anand (9/60) than Mehsana (30/68). Therefore, it indicates better application of knowledge by health worker in Mehsana.

The knowledge regarding "*Taking all drugs regularly is critical to prevent the spread of disease*" is important for adherence to treatment. In present study we observed that 37.6% in Anand and 61.8% in Mehsana district, the chest symptomatics were aware about this fact (Table 5.1.17). The difference could be explained with probable increase in awareness because of intensified anti-tubercular activities in Mehsana due to RNTCP implementation.

6.2. 3. The knowledge – Availability of services:

The knowledge of facility, about the free diagnosis and treatment of tuberculosis nearer to the patient house of chest symptomatics played a major role for choice of treatment centre. In present study 51% (52/102) in Mehsana and 13.6% (17/125) in Anand, chest symptomatic patients were aware about the availability of free of cost services at primary health centre located nearer to their houses (Table 5.1.18). The difference was highly statistically significant (P value <0.0001). It could be because of RNTCP project at Mehsana.

Figure 6.2
Knowlegde- TB fact among chest symptomatics

Category	Mehsana	Anand
Is there vaccine for TB?	24 5	35 2
TB drugs are free of cost - govt hospital	59 8	74 4
TB is curable	80 4	74 4
Drug regularity is critical to spead TB	61 8	37 6
TB pt not taking treatment can spread the TB	66 7	48
TB germ can seen in sputum	22 6	33 6
one can get TB form another person	84 3	69 6

0   10   20   30   40   50   60   70   80   90

% of chest symptomatics

6.2.4. Knowledge – Health worker and his role in TB control activity:

As envisaged in NTP guidelines, the health worker should help in diagnosis of more TB cases by identifying the chest symptomatic in community and should refer them to nearest designated microscopic centre. He should also keep the patients on their treatment for full period, provide health education to the community (NTI 1994). The responsibility of health worker was increased in RNTCP, as he had to provide directly observed treatment (DOTS) under his direct supervision to all TB patients of his area (GOI 1992).

The present study reviewed the status of health worker through chest symptomatic patients. We observed that 88.2% of

Mehsana and 95% of Anand, chest symptomatic patients houses were visited by health workers during last one month prior to community survey (Table 5.1.19). The purpose of health worker visits was mainly for Malaria, Universal Immunization Programme (UIP), and Family welfare Programme (FP). Only 2.2% of chest symptomatic at Mehsana district had reported that the health workers were visited to their house for TB work (Table 5.1.20). However, none of the chest symptomatic patient reported from Anand that health worker had visited their house for TB work. It concludes that the health workers visited to patient's houses were meant for other than TB work in majority.

Among the chest symptomatic patients 21.6% in Anand & 37.5% in Mehsana knew regarding the fact that the health worker can help for diagnosis and treatment of TB (Table 5.1.21).

6.2.5 Choice of health care provider:

Patient's perception of various health provider and patient provider interaction as well as patient knowledge regarding availability of services played an important role in choosing provider.

In present study, 62.8% in Mehsana and 55.2% in Anand, the chest symptomatic patients made a first contact to private health care provider. While 20.9% in Mehsana and 28.1% in Anand, the chest symptomatic patients made first contact to government health facilities (Table 5.1.10 and figure 6.3). Similar observations were also made by Upleker (1996) at Pune, Nair (1999) at Mysore, and by World Bank (1996) in India.

6.2.6 Laboratory investigation among chest symptomatic by health care provider: According to the RNTCP guideline, if a patient is having chest symptoms i.e. cough for 3 weeks or more, a sputum examination for AFB is recommended.

38.8% (7/18) in Mehsana and 40.7% (11/27) patients in Anand were confirmed that their sputum was examined by govt. institution, where they had first contacted. While 22.2% (12/54) chest symptomatic patients in Mehsana and 11.3% (6/53) chest symptomatic patients in Anand were subjected for AFB examination by private treating doctor to whom the patient had first contacted (Figure 6.3).

Upleker study found that private provider had advised sputum AFB investigation to 20% of rural chest symptomatic patients of Pune district (Upleker 1996).

The above discussion suggests that on an average less than $1/5^{th}$ of chest symptomatic patients were investigated for sputum AFB examination as per GOI guidelines. This could be the bottleneck cause of low case detection rate in Mehsana.

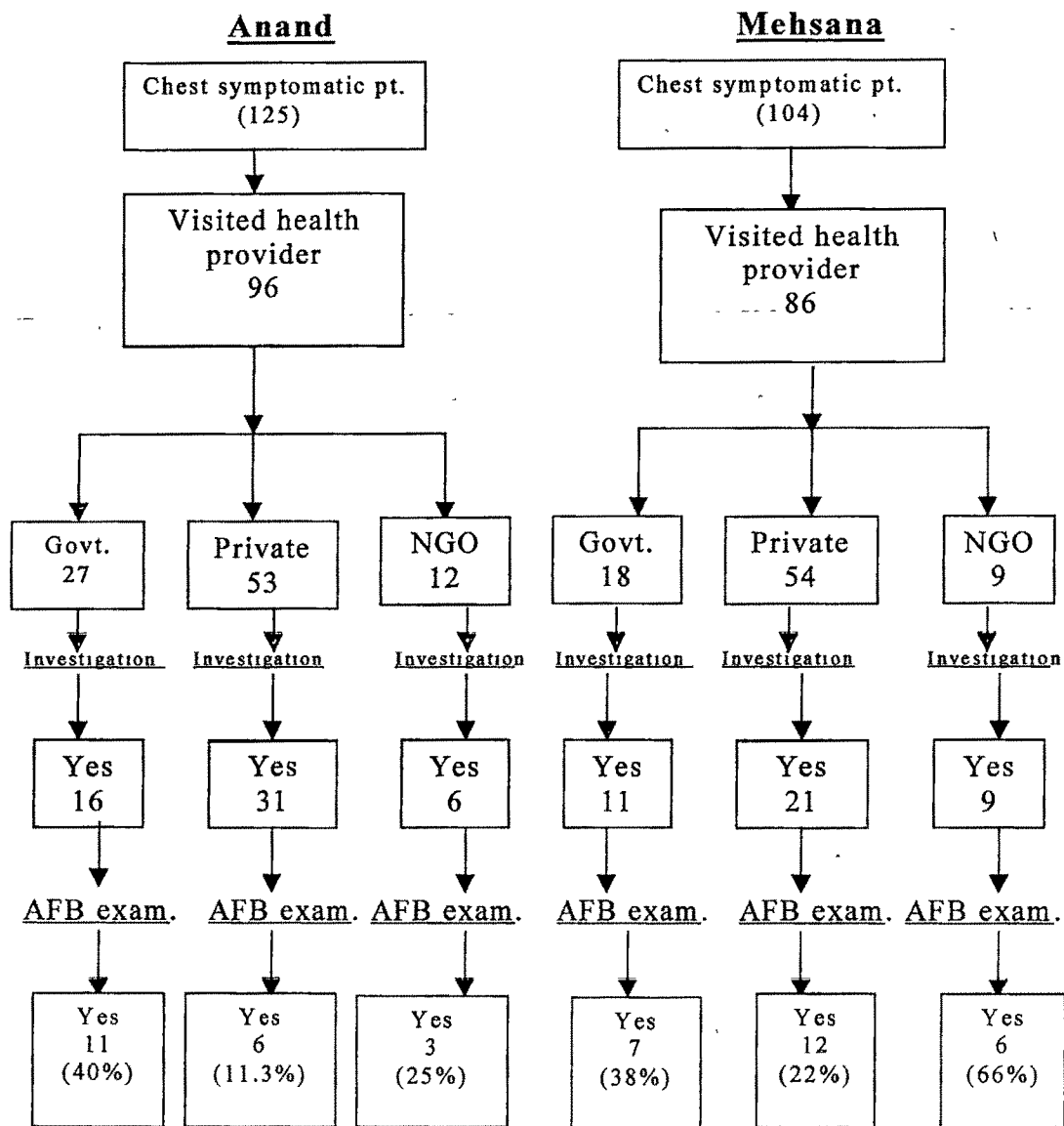### 6.2.7 Chest symptomatic and sputum smear AFB positivity:

In our study, the sputum sample of chest symptomatic patient was taken 3 times for sputum smear examination (as recommended by RNTCP guideline), the first spot sample, second early morning sample and third spot sample on second day. If patient did not report, our team visited the patient home for collection of sputum sample.
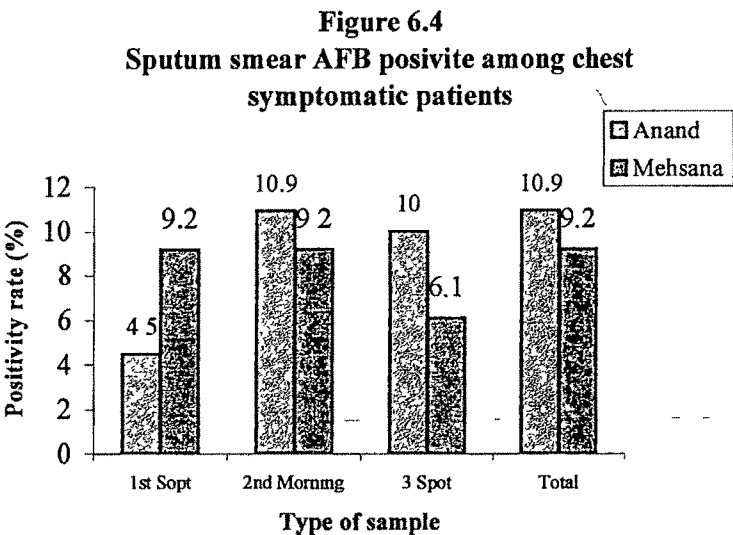
96% (98/102) symptomatics at Mehsana and 88%(110/125) symptomatics at Anand had given the sputum sample for AFB examination (Table 5.1.23). The reasons for not giving sputum sample included lack of faith in the govt., alcoholic state, and no response (Table 5.1.24).

The sputum positivity rate observed was 10.9% (12/110) at Anand and 9.2%(9/98) at Mehsana on smear microscopy (Table5.1.25). The positivity rate observed with all the three samples is shown in figure 6.4.

Figure 6.3

Health facility use by rural chest symptomatic patient

Anand

| Chest symptomatic pt. (125) |
| Visited health provider 96 |

| Govt. 27 | Private 53 | NGO 12 |

Investigation | Investigation | Investigation

| Yes 16 | Yes 31 | Yes 6 |

AFB exam. | AFB exam. | AFB exam.

| Yes 11 (40%) | Yes 6 (11.3%) | Yes 3 (25%) |

Mehsana

| Chest symptomatic pt. (104) |
| Visited health provider 86 |

| Govt. 18 | Private 54 | NGO 9 |

Investigation | Investigation | Investigation

| Yes 11 | Yes 21 | Yes 9 |

AFB exam. | AFB exam. | AFB exam.

| Yes 7 (38%) | Yes 12 (22%) | Yes 6 (66%) |

Figure 6.4

**Sputum smear AFB posivite among chest
symptomatic patients**

Type of sample

6.3 TB patient perception:

Total 240 tuberculosis patients, who were diagnosed and put on treatment during the period of 1st January 1998 to 31st December 1998 were registered in a community based survey form the randomly selected 16 villages of district Mehsana and Anand. The total 231 patients (91 Mehsana+140 Anand) were interview (Table 5.2.1) by team of TB Supervisor using semi-structure, pre-tested questionnaire.

The survey team made a revisit to the patient, who was not available on the day of visit. 9 patients could not be interviewed due to various reasons (e.g.– admitted to hospital, migrated, out of station due to social reason) (Table 5.2.2).

6.3.1 Age and sex distribution:

There is large difference in TB incidence by age. Theoretically, this disparity may be attributed to difference in risk or prevalence of infection, difference in disease risk once infected

or both. The trend of commonly observed higher incidence of disease with increasing age can be partly explained by the cumulative increasing of infection (Rieder 1999).

In our study, the proportion of TB cases increases with age and were higher in male than female (Figure 6.5). We observed that 3.01 patient per 1000 population in Mehsana and 3.93 patient per 1000 population in Anand were started treatment of TB during the year 1998 (Table 5.2.7) These difference suggest reduction of 0.91 TB patients per 1000 in Mehsana roughly. The reduction was observed in all age groups. The age and sex specific distribution of TB cases are shown in figure 6.5.

Figure 6.5
Age & Sex spacific distribution of TB Patients
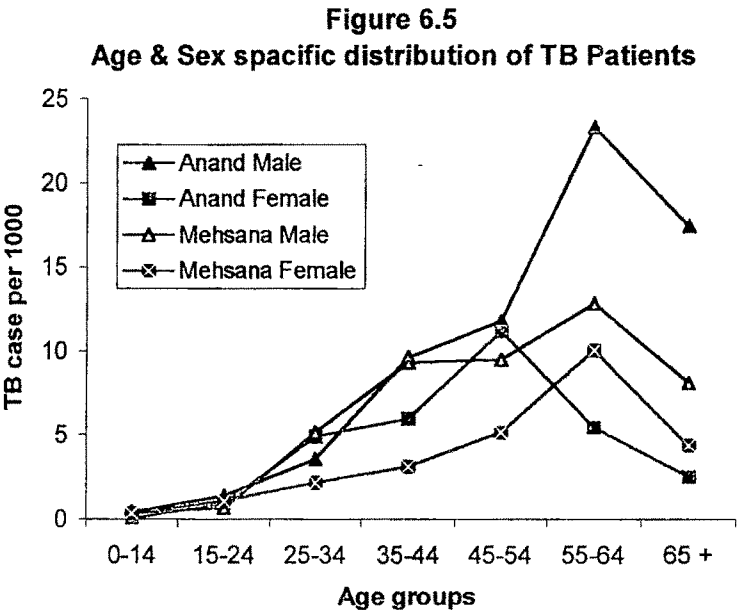
6.3.2 TB patient awareness and Perception about TB:

6.3.2. (A) Acceptance of diagnosis: our study team found that stigma still existed towards the disease. The household member did not want to talk about the disease. The household, who had TB patient in their family or among close relative were more

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responsive. They shared their worries and concern. The patients wanted to hide the disease from their family and their community. In our study, 17.1% TB patients in Anand and 9.9% TB patients in Mehsana denied about their disease though they were taking TB drugs, even after probing (Table 5.2.8). In a study done at rural population at Pune district, 8.7% of TB patients denied about the disease (Upleker 1996). Dots programme may explain more often to talk about the disease in Mehsana as compared to Anand but stigma still prevailed.

6.3.2 (B) Knowledge of TB symptoms and symptoms experience by patient: As mentioned earlier the TB patients were reasonably aware about the symptoms of TB. The Patients mentioned cough, weakness followed by loss of appetite, weight loss, and fever, when they were asked to enumerate the symptoms of TB (Table 5.2.10). In the present study 95.7% patients experience the symptom as cough. The other symptoms were fever (92.65%) followed by weakness (60.2%), chest pain (49.8%), loss of appetite (44.2%), and blood in sputum (22.8%) experienced by the patients (Table 5.2.9).

6.3.2 (C) Choice of health care provider:

66.4% in Anand and 60.4% in Mehsana, the TB patients first visited to private health care provider. While 25% in Anand, and 28.6% in Mehsana, the TB patient first visited to govt. health care provider. The difference observed in both the district was statistical not significant (P value = 0.55) (Table 5.2.11). Similar finding was also observed by Upleker (1996) study conducted at Pune.

Therefore, the private health care provider was the key personnel to whom patients made first contact for their symptoms.

6.3.3 Shopping for diagnosis:

The figure 6.6 shows that, 77.1% (27/35) TB patients in Anand and 100% (26/26) TB patients in Mehsana were diagnosed as a TB patient at his first source of health seeking at govt. institution.

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Figure 6.6 (A)

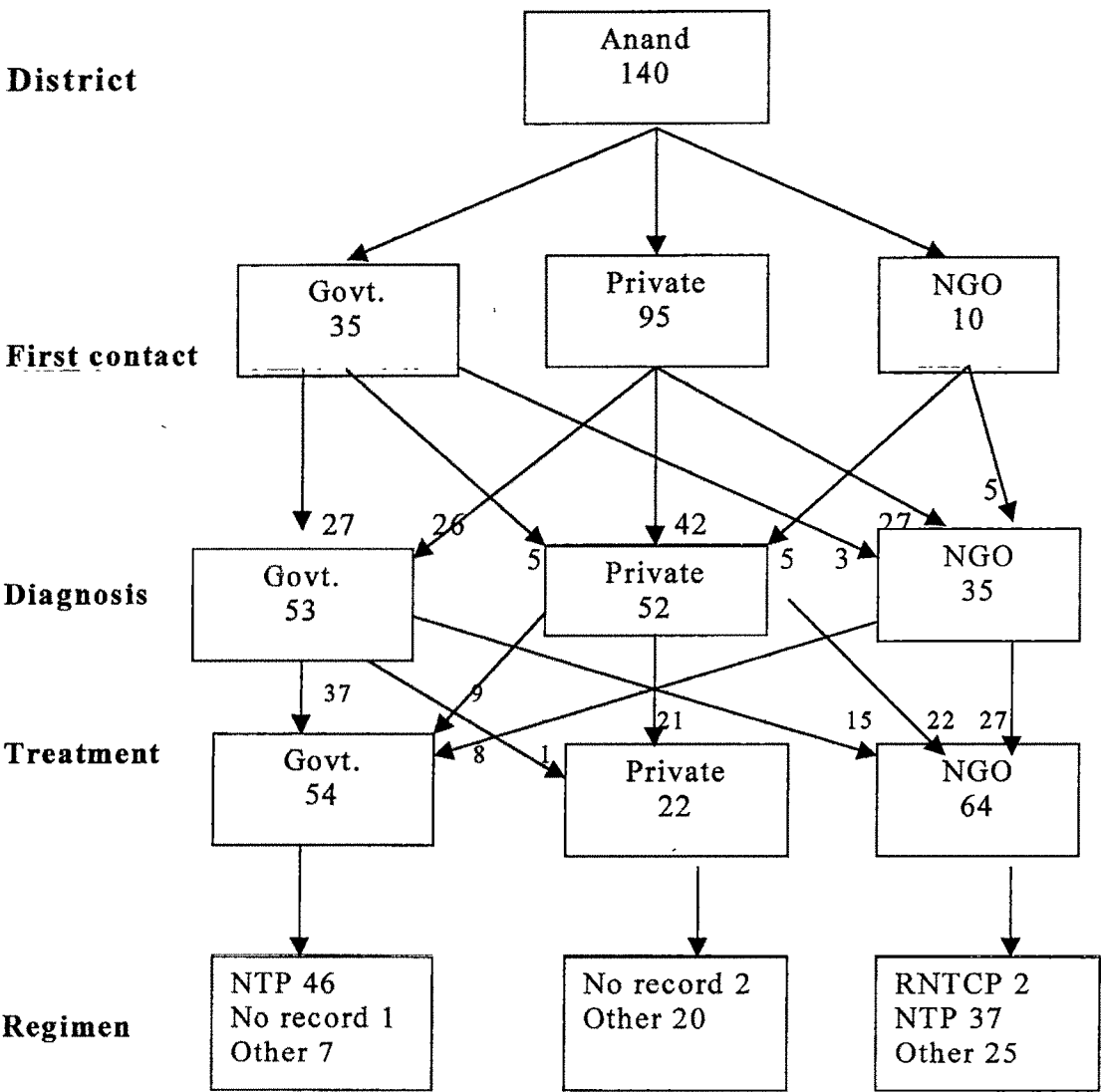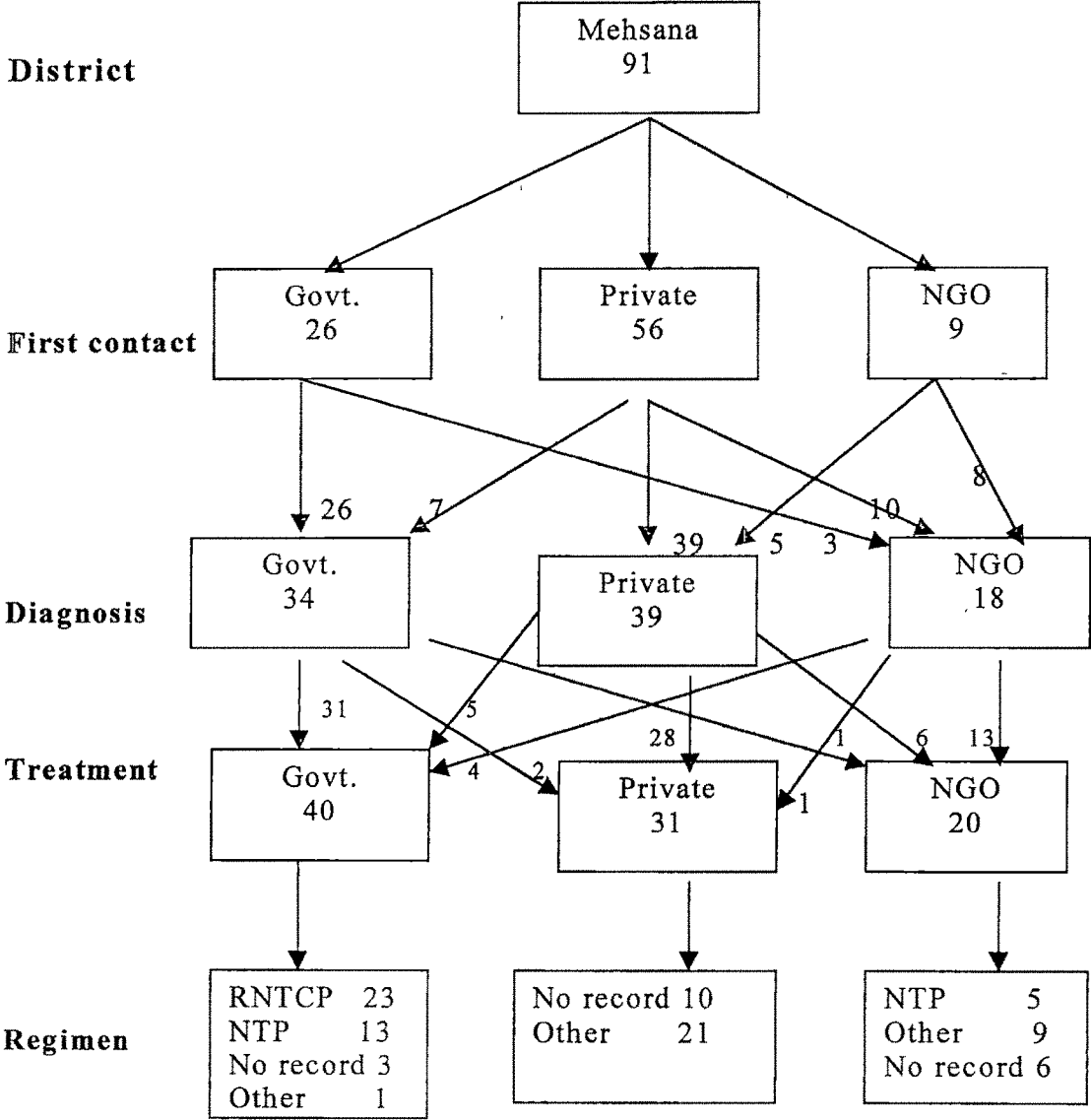## Shopping for diagnosis & treatment of TB patient in Anand district

District

| Anand |
| 140 |

First contact

| Govt. | Private | NGO |
| 35 | 95 | 10 |

27   26   42   27   5

Diagnosis

| Govt. | 5 | Private | 5 3 | NGO |
| 53 | | 52 | | 35 |

37   9   21   15   22   27

Treatment

| Govt. | 8 1 | Private | NGO |
| 54 | | 22 | 64 |

Regimen

NTP 46	No record 2	RNTCP 2
No record 1	Other 20	NTP 37
Other 7		Other 25

Figure 6.6 (B)

Shopping for diagnosis & treatment of TB patient in Mehsana district

District

> Mehsana
> 91

First contact

> Govt.
> 26

> Private
> 56

> NGO
> 9

Diagnosis

> Govt.
> 34

> Private
> 39

> NGO
> 18

26   7   39   5   3   10   8

Treatment

> Govt.
> 40

> Private
> 31

> NGO
> 20

31   5   4   2   28   1   6   13   1

Regimen

> RNTCP 23
> NTP 13
> No record 3
> Other 1

> No record 10
> Other 21

> NTP 5
> Other 9
> No record 6

It shown that there was definite improvement in quality of diagnosis in Mehsana.

44% (42/95) patients in Anand and 70% (39/56) patients in Mehsana were diagnosed by private health care provider, who seek help as a first source to private health care provider (Figure 6.6 (A) and 6.6(B)).

The diagnostic tests to which patients were subjected were studied. 97.1% (136/140) patients in Anand and 86.8% (79/91) patients in Mehsana, were submitted for X-ray chest. While 67.8% (95/140) patients in Anand and 65.9% (60/91) patients in Mehsana were asked for sputum AFB examination at the time of diagnosis. On further inquiry, whether the sputum AFB examination was done as per government of India recommendation (e.g. one spot – second early morning- third spot sample). 17.9% and 61.7% patients in Anand and Mehsana respectively, had sputum examination as per GOI recommendation (Table 8.2.14). The observed difference was statistically highly significant (P value =0.0000001). However in 39.3% patients at Mehsana did not follow GOI norm.

Above discussion suggest that there was an excessive use of radiological investigation then sputum AFB smear microscopy for diagnosis by treating physician.

6.3.4 Shopping for treatment:

TB patients were known for shopping for treatment after being diagnosed. When patient who had use both the private and govt. sector, they shift from one provider to another

Place of treatment- In the present study, 69.8% (37/53) patients in Anand and 91.2% (31/34) patients in Mehsana had initiated the treatment at govt. run services after being diagnosed at govt. institution (figure 6.6 A &B). While rest 1.7% (1/53) patients in private and 28.3% (15/53) patients in NGO at Anand shifted for treatment after being diagnosed at govt. institution. Similarly 5.8%

(2/34) patients in private and 17.6% (6/34) patients in NGO, were shifted for treatment after being diagnosed at govt. institution in Mehsana.

40.4% (21/52) patients in Anand and 71.8% (28/39) patients in Mehsana had continued treatment with private provider after being diagnosed at private provider. The rest 17.3% (9/52) patients with the govt. institution, 42.3% (22/52) patients with NGO at Anand district and 12.8% (5/39) patients with govt. institution, 15.8% (6/39) patients with NGO in Mehsana district had shifted from private provider after being diagnosed (figure 6.6 A& B).

Similarly 77.1% (27/35) patients in Anand and 72.2% (13/18) patients in Mehsana continued treatment with NGO after being diagnosed at NGO. While rest 22.8% (8/35) patients with the govt. institution and none with private provider in Anand, had shifted for treatment after being diagnosed at NGO. 22.2% (4/18) patients with the govt. institution and 5.6% (1/18) patients with Private provider in Mehsana, had shifted for treatment after being diagnosed at NGO (figure 6.6 A&B).

Above discussion suggested that shifting of patients were more towards the NGO at Anand and towards the Government institution at Mehsana. The factor in favor of govt. institution in the project area of Mehsana may be availability of quality drugs, increase reference by health care provider, and increase awareness of treatment centre in community.

6.3.5 Treatment Regimen received by TB patients:

The TB patients were given enough medicine to survive, but not enough to recovered completely. The key was that the TB patient must not be just treated, but they must be treated to ensure complete cure by standardized combination of anti TB drugs in right doses for adequate length of time. The government of India had given a guideline regarding the drugs regimens for TB patient,

after considering the scientific fact and drug trial. These regimens were field-tested. The list of drug regimens for RNTCP and NTP area are given in appendix-1.

The drug regimen used by health care provider like government, private, and NGO were also reviewed in our study. The information was collected on retrospective inquiry from the patients who were registered during community survey. 85.2% (46/54) patients in Anand and 90% (36/40) patients in Mehsana, who were treated with govt. institution received the RNTCP and NTP regimen as recommended by government of India.

As per GOI guideline, more than 90% patients must be put on RNTCP regimen under DOTS in RNTCP area (Mehsana). Only 57.5% (23/40) patients were put on RNTCP regimen in Mehsana. The rest 32.5% (13/40) patients were put on treatment on unsupervised NTP (SCC) regimen (Figure 6.6 A&B). All these patients were getting treatment from DTC Mehsana. It was because of selective approaches of DTC medical officer, who was responsible for putting 32.5% patients on non-DOTs unsupervised regimen to show higher cure rate. It was because patient put on other than RNTCP regimen was not evaluated for treatment outcome as per RNTCP quarterly report format. As per discussion with DTC medical officer, our team found that a "Waghari" community patient's in Mehsana were most irregular in taking treatment that gave a misleading impact on cure rate. Therefore, such patients were put on NTP unsupervised regimen.

The need for direct observation of treatment was to ensure good compliance. However as observed in our study a community likely to had poor compliance was omitted from DOTS to ensure better result of DOTS in percentage at the cost of very purpose of DOTS to ensure better compliance among those who was otherwise likely to default.

6.3.6 Adverse effects of Anti TB drugs:

Most patients complete their treatment without any significant adverse effect of drugs. However, a few patients developed adverse effects. Clinical monitoring of all TB patients for adverse effect is thus important during treatment. The adverse effects ware classified as a minor and major (Dermot Maher et al 1997). The patient, who developed minor adverse effect, should continue the anti TB drugs, usually at the same dose with symptomatic treatment. If the patient develops major adverse effect, the treatment or the offending drug was recommended to be stop, otherwise lead to serious complication and patient became drug default. Therefore monitoring of adverse effect of anti TB drug was very important for successful treatment and achieving cure.

The side effects were categorized as minor or major based on RNTCP guidelines (GOI 1997). The minor side effect includes-Epigastric pain, dry skin, metallic test, and itching. While major side affect includes- Hepatitis, perpura, SJ syndrome, color blindness, and loss of hearing.

In the present study, 12% (3/25) and 4% (1/25) patients had minor and major side effect respectively among the patients who were on RNTCP regimen. While 17.4% (8/46) and 4.3% (2/46) patients had minor and major side effect respectively among the patients who were on SCC regimen. 7.3% (6/83) patients had minor and 8.3% (7/83) patients had major side effect, who were on the other regimen not recommended by GOI (Table 5.2.20).

The above finding suggested that minor side effects were less in other regimen patients. While the major side effects were double in other regimen than NTP regimen. The lowest were observed in RNTCP regimen patients.

6.3.7 Treatment adherence:

The patient compliance is a key factor in treatment success. In many countries, a significant proportion of patients were dropout from treatment for various reasons. When patient received self-administered treatment, the default tracing is difficult and often unproductive. So promoting compliance by directly observed treatment (DOT) is very useful, and that is the vital component of RNTCP programme.

The regularity of taking treatment by patient was reviewed in present the study. We found that 69.3% (97/140) patients in Anand and 70% (64/91) patients in Mehsana were regular in taking treatment (Table 5.2.19). The observed difference was statistically not significant. While 95.6% (22/23) patients, who were on RNTCP DOTS regimen were regular on treatment (Table not shown). It could be due to repeated motivation and supervision of patient by DOTS worker at Mehsana.

6.3.8 Default retrieval:

When a patient does not keep on arranged appointment to receive treatment, it is necessary to find the patient, using the contact address. He is considering as a defaulter till he/she collects /receive the drug. In NTP, a first defaulter action is taken on the same day or next day by posting a reminder letter. If the patient does not report within 3 days from the date of first action, than a second defaulter action taken by making home visit and motivating the patient for regularity of treatment (NTI 1994). However, in RNTCP the first action was recommended immediately, if patient does not come for collection of drugs on fixed appointment. The DOTs worker makes a home visit on the same day. If the

patient does not report, than a revisit is made within 7 days (GOI 1997).

In the present study, 74% (40/54) patient in Anand and 60% (24/40) patient in Mehsana, had given the history of missing the drug at least once on an arranged appointment during the course of treatment. These all patients were under treatment at government institution (Table 5.2.25). They were asked about the visit of health personnel during default period. 5% (2/40) in Anand versus 45.8% (11/24) patients in Mehsana conformed health personnel visit during their default period (Table 5.2.26). The categories of health personnel visited to default patient were health worker, medical officer, and TB supervisor (Table 5.2.27). The involvement of health worker and medical officer for default retrieval was observed only in Mehsana. Observed difference could be because of the effect of training, improvement in the supervision and monitoring due to RNTCP project at Mehsana. The default tracing by NGO and private health care provider were not observed except at Tribhuwandas Foundation (TF) Anand.

6.3.9 **Buying of anti TB drugs by patients:**

The diagnosis and treatment to every TB patient is to be provided free of cost at every govt. run institutions as per National Tuberculosis Control Programme in India (NTI 1994). However, some time in practice the treating physician prescribed the Anti TB Drugs, which is out of stock at govt. health institution. The reason for short of supply could be to lack of supply, or delay in logistic procedures.

In the present study, 13% (7/54) patients in Anand and 7.5% (3/40) patients in Mehsana, who were on treatment at govt. institution, spent money on account of doctor's fees,

diagnostic test, drug purchase and transport. The mean expenditure was Rs. 528.75/ month/patient at Anand and Rs. 266.67/month/patient at Mehsana as per patient statement (Table 5.2.22). While the patients who were under treatment with private health care provider, had spent money Rs. 752.27 per month/patient in Anand and Rs. 635.48 per month/patient in Mehsana (Table 5.2.22).

Upleker (1996) also observed that total expenditure made by rural patients of Pune district was Rs.673 per month.

6.4 Tuberculosis mortality

Death from tuberculosis was the longest recorded indicator of the tuberculosis epidemic in industrialized countries. The information on deaths was rarely or never systematically collected in low-income countries (Rieder 1999). TB case fatality is largely determined by site and type of disease and by appropriate and timely intervention.

6.4.1 Death registration:

It is mandatory to register every death and birth in India as per birth and death registration act. The talati is responsible to maintain the death register at a village level in Gujarat.

The information regarding death was collected from village death register and through house-to-house survey by our study team. We observed that 15.9% of deaths were not registered at village death register (Table 5.3.1). The reason for non-registration were explained by talati --

- If the death occurs at the hospital located at other place, such deaths were registered at the place of death.
- Lack availability of stationary.

The possible other reasons were could be--

- The lack of knowledge in the community regarding necessity of the death registration.

- Non-availability of a person responsible for registration due to various reason i.e. Long leave, absence due to meeting at a district level, and unauthorized absence.

- Lack of supervision by the supervisory authority ,e.g. District birth and death registrar.

The death registration in the village register at Anand and Mehsana is shown in figure (6.7).

Figure 6.7

Percentage of death register in village panchayat ragister
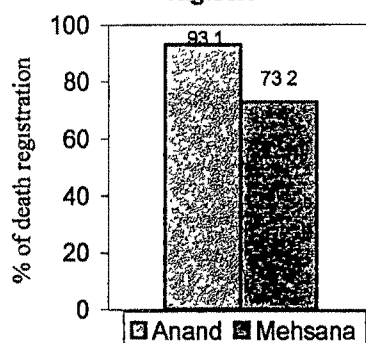

6.4.2 **Crude death rate & Tuberculosis death rate:**

The death from 1st January 1998 to 31st December 1998 was registered in the present study. Observed crude death rate (CDR) were 11.33/1000/year in Anand and 8 7/1000/year in Mehsana (Table 5.3.3). The proportion death attributed to TB was 16.6% in Anand and 8.6% in Mehsana (Table 5.3.2). The TB disease specific death rate was calculated 188/Lakh/year in Anand and 76/Lakh/year in Mehsana. The difference was statistically significant (P value < 0.01) (Table 5.3.3)

The risk of dying from TB is depends on the site and type of the disease and the timeliness of diagnosis (Rieder 1999). The case fatality is closely linked to the availability of timely and curative chemotherapy as well regularity of treatment. So the observed reduction in CDR and TB death rate in Mehsana in comparison to Anand could be due timely diagnosis and regularity of treatment on account of DOTS implementation in RNTCP project.

6.4.3 Age and Sex specific death rate

The age specific TB death rate was higher in 25-44 year age group in both the district. While the observed difference was in both the district is statistically significant (Table 5.3.6 & Figure 6.8). The death due to TB and other cause was also studied. We found that the death due other cause increased with age and was having a similar pattern in both the district (Figure 6.9)

Figure 6.8
Age specific TB death rate

Figure 6.9
Death rate due to other than TB cause
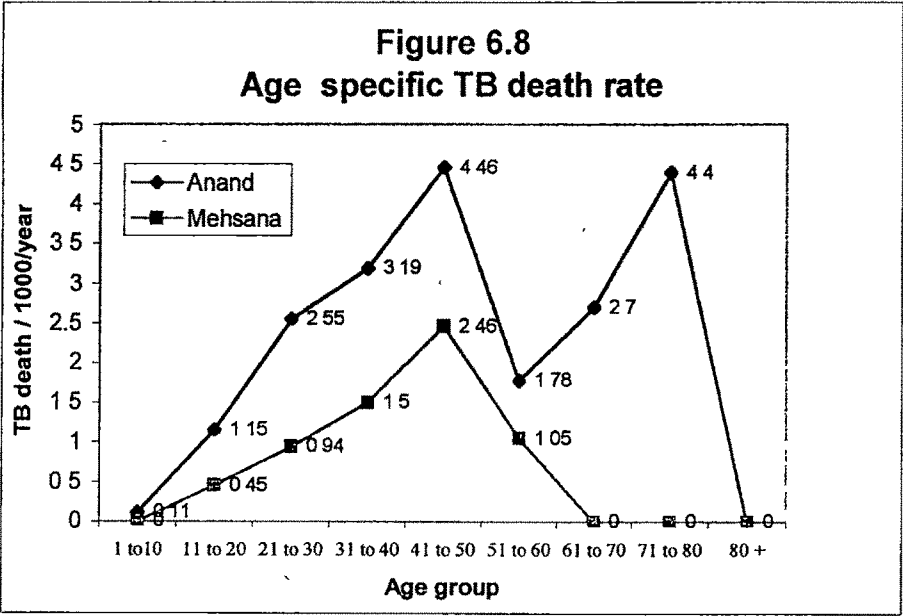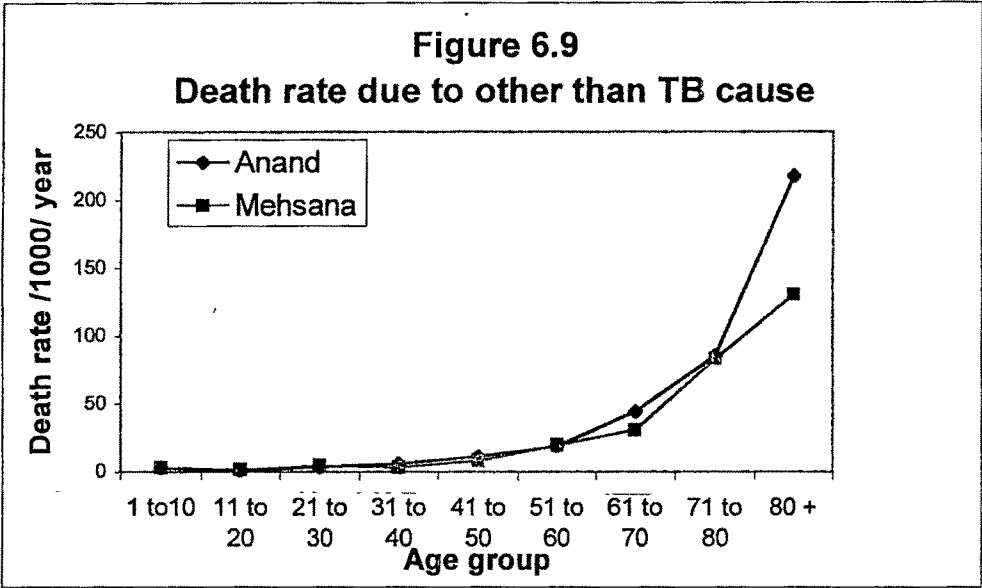
The gander difference among the deaths was also studied. We found that the TB deaths among the male were higher than female in both the district. It was just double in Anand as comparison with Mehsana district (Table 5.3.7 & Figure 6.10)

Figure 6.10
Sex and cause of death
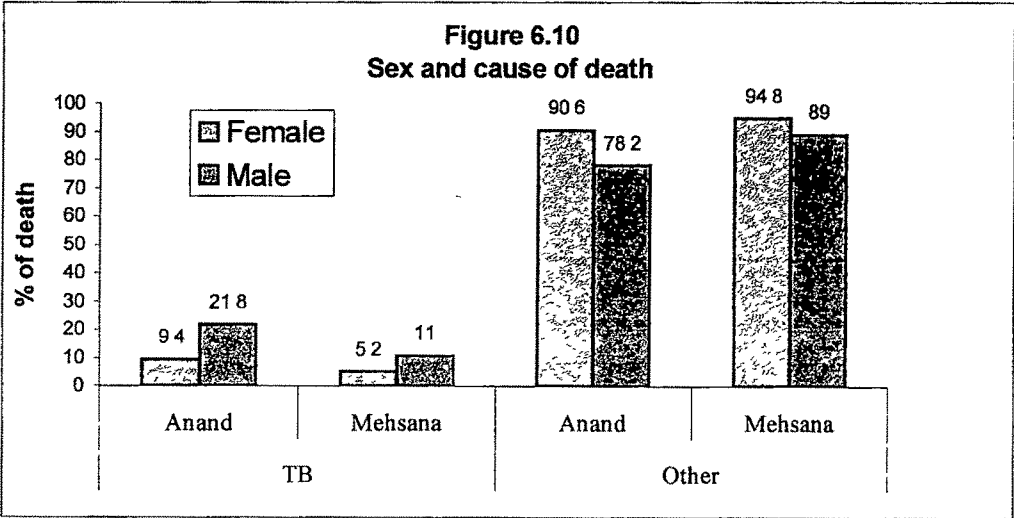
6.4.4 <u>**TB death rate and other associated disease**</u>:

74.4% (67/90) patients died due to TB as a cause of death. While rest 25.6% (23/90) TB patients had associated disease like AIDS (1.1%), heart disease (1.1%), diabetics (3.3%), kidney (2.2%) and Silicosis (17.8%)(Table 5.3.8).

6.5 <u>**Health care provider perspectives**</u>:

6.5.1. <u>**Priority to TB Control Programme**</u>:

The health functionary in the community – the health worker are the first level of health care provider from government run service. The health worker comes across to chest symptomatic and TB patients during their field visit in village. The appropriate recommended action solely depends upon, how the health worker gave priority to these patients.

21.1% (11/52) in Anand and 59.1% (39/66) in Mehsana, the Para-medical health personnel gave the top priority to TB control programme in the present study (Table 5.5.3). On further analysis how the concept of priority changed with TB programme after the training was also studied. We found that 33.1% (4/12) in Anand and 61.1% (36/59) in Mehsana, the trained health personnel gave the priority to TB control work. While 17.5% (7/40) in Anand and 42.9% (3/7) in Mehsana, the untrained health personnel gave the priority to TB control work (Table 5.5.4).

7% of health worker responded as a priority to TB control activities at Pune (Upleker 1996).

The priority given by medical officer was also studied in the present studied. We found that 28% (7/25) in Anand and 42.8% (6/14) in Mehsana, medical officer gave the priority to TB Control Programme (Table 5.4.1).

In a study (ICORCI 1988), the researcher found that 26% of medical officer gave an affirmative answer regarding equal priority to all health programmes.

Chapter 6 - Discussion

-- Therefore, the above discussion suggests that there was an increased priority towards TB control activities among the health care worker in RNTCP area as compared to control area.

6.5.2 Knowledge, Attitude and Practice – Health care provider:

6.5.2(a) Training: Training /retraining is an important tool to increase the knowledge and change in attitude & practice of health care provider.

A pre-tested fixed questionnaire form was given to medical officer and para-medical health personnel for filling up in their own hand writing in the present study. The following point was taken in consideration to review the training component.

(1) Duration of training in comparison to GOI norm.

(2) Time lapse after training.

16%(4/25) medical officer in Anand and 85.7%(12/14) medical officer in Mehsana were reported that they had received TB Control Programme training (Table 5.4.1). All medical officer of Anand district had taken training before 6 years or more. While all medical officers in Mehsana reported that they had received training within last 6 year (Table5.4.3). It concludes that medical officer in Mehsana received TB training after RNTCP implementation.

The duration of training in Mehsana was as per GOI recommendation i.e. 5 days. While duration training in Anand was not as per GOI recommendation i.e. 2 days.

23.1%(12/52) in Anand and 89.3%(59/66) in Mehsana, the para-medical health personnel were reported that they had received TB Control Programme training (Table 5.5 5). Among Mehsana, health personnel, all received training within last 6 years. While 41.7%(5/12) para-medical health personnel at Anand had TB training before 6 year (Table 5.5.6).

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Two days TB training was recommended by GOI for para-medical personnel like health worker, pharmacist, B.E.E., While 10 days for laboratory technician. 14.3%(1/7) in Anand and 69.4%(34/49) in Mehsana, health worker had received TB training as per GOI recommended norm (Table 5.5.7).

The above finding suggests that the status of training was significantly better at Mehsana as compare to Anand. However the re-training was not observed in both the districts.

6.5.2(b) Knowledge:

(1) Cardinal symptom of TB:

The knowledge about the cardinal symptom of TB as reported by para-medical health personnel were studied. It showed that majority (87%) of health personnel's reported cough as a symptom of TB. The other symptoms included -loss of appetite, low grad fever, loss of weight, and blood in sputum were reported by 32% to 87% of health workers in both the districts. The observed difference was not statistically significant in Anand and Mehsana (table 5.5.13).

(2) Method of diagnosis:

73.1% (38/52) in Anand and 81.8% (34/66) in Mehsana, the health personnel reported sputum AFB microscopy as the best method of diagnosis (Table 5.5.14). The observed difference was not significant in both the districts.

(3) Place of diagnosis and treatment:

42.3%(22/52) health workers in Anand and 90.9%(60/66) health workers in Mehsana were reported primary health centre as a place of diagnosis. While 28.8%(15/52) health workers in Anand and 90.9%(60/66) health workers in Mehsana reported primary health centre as a place of treatment (Table 5.5.16). The observed difference is highly statistically significant (P value = <0.0001).

This difference was could be due to good quality of training as well improvement in supervision on account of RNTCP at Mehsana.

6.5.2 (C) Chest symptomatic reference by health worker:

65.4%(34/52) health workers in Anand and 77.3%(51/66) health workers in Mehsana reported, that they had made reference of chest symptomatic during their field visit (Table 5.5.17). On further analysis we found that 35.3%(12/34) health workers in Anand and 88.2%(45/51) health workers in Mehsana made a reference of chest symptomatic patients to primary health centre (Table 5.5.18). The observed difference was statistically significant (P value = <0.0001).

6.5.2 (d) Chest symptomatic examination as reported by M.O.:

The chest symptomatic patients were approaching to health care institution for their suffering. The chest symptomatic examined for sputum AFB examination as reported by medical officer was studied. 48%(12/25) of medical officers in Anand reported that they had examined < 25% of chest symptomatic patients, who had attended their out patient clinic (Table 5.4.6). While 28.6%(4/14) medical officers reported in Mehsana that they had examined all chest symptomatic patients attended at their out patient clinic. 71.4%(10/14) medical officers had reported that they had examined 25% to 75% of chest symptomatic patients, who had attainted their out patient clinic.

6.5.2(e) Knowledge of drug regimen as reported by MO:

50%(2/4) medical officers in Anand and 58.3%(7/12) medical officers in Mehsana were knew correctly about the RNTCP regimens while none was knew about SCC and SR regimen (Table 5.4.12). Upleker (1996) also noticed the similar observations at rural area of Pune.

6.5.3 Default retrieval and health care provider:

Dealing with the drug default is a bottleneck of current TB Control Programme. Nearly 70% of TB patients were defaulted during a course of treatment in India (NTI 1997). The duty of medical officer is to insure that all patients of TB take regular treatment till they declare as a cure patient.

Therefore review of knowledge of default patient among the medical officer was studied in the present study. We found that 44%(11/25) MO in Anand and 64.3%(9/14) MO in Mehsana were aware about the default patient at their own institution (Table 5.4.14). The observed difference in both the district was not statistically significant (P value=>0.22).

On further analysis, 80% of medical officers in both the district reported that the senior TB supervisor (STS)/TB supervisor (TBS) were the health personnel, who takes the defaulter action at their institution (Table5.4.15). 12%(3/12) MO in Anand and 78.6%(11/14) MO in Mehsana reported that they had visited default TB patient for default retrieval (Table5.4.15).

The health worker (DOT worker) takes the defaulter action in Mehsana, while in Anand it was not observed.

6.5.4 Monthly monitoring report and feed back:

The responsibility of preparation of monthly monitoring report (MMR) in TB Control Programme was assigned to pharmacist (NTI 1994). 80%(20/25) MO in Anand and 62.3%(9/14) MO in Mehsana reported that the pharmacist prepared the MMR at their institution (Table 5.4.10).

7%(2/25) MO in Anand and 92.9 (13/14) MO in Mehsana reported that they had received the feedback of their MMR repot with in 3 months of their submission (Table 5.4.11).

6.5.5 Supervision:

Good supervision is the process of helping health worker to improve their performance. During supervisor visit one should observe and reinforce stipulated practice in the various components of TB Control Programme activities as well as recording discrepancies. The frequency of visit of supervision visit recommended by GOI was at least once in three months. The detail is shown in Appendix (4).

13.5% and 17.3% of health worker confirmed the visit of Male Health Supervisor (MHS) and Female Health Supervisor (FHS) respectively to sub-centre for TB programme, during previous 3 months in Anand (Table 5.5.21). While 28.8% and 31.8% of health worker report that their Male and female heath supervisor made a visit to sub-centre for TB control activity, during previous 3 months in Mehsana (Table 5.5.21). Therefore, supervision through health supervisor was poor in both the district. However there was a marginal improvement in Mehsana district.

26.9%(14/52) health worker in Anand and 72.7%(48/66) of health worker in Mehsana reported that their medical officer had made a supervisory visit to sub-centre during previous 3 months (Table 5.5.21). Almost half of health worker reported that their supervisor made a visit to default TB patient during their visit to sub-centre (Table 5.5.22). The observed difference in both the district was statistically not significant.

24%(6/25) MO in Anand and 64.5%(9/14) MO in Mehsana had reported one or more supervision visit of DTO at primary health centre during current year (1998) for TB control activity (Table 5.4.8).

4%(1/25) MO in Anand and 35.7%(5/14) MO in Mehsana had reported one or more visit of State TB Officer (STO) during year

1998. Similarly CDHO also made the supervisory visit at 40% PHC in Anand and 71.4% PHC in Mehsana (Table 5.4.8& figure 6.11).

Figure 6.11
Supervisory visit to PHC as per medical officer in year 1998
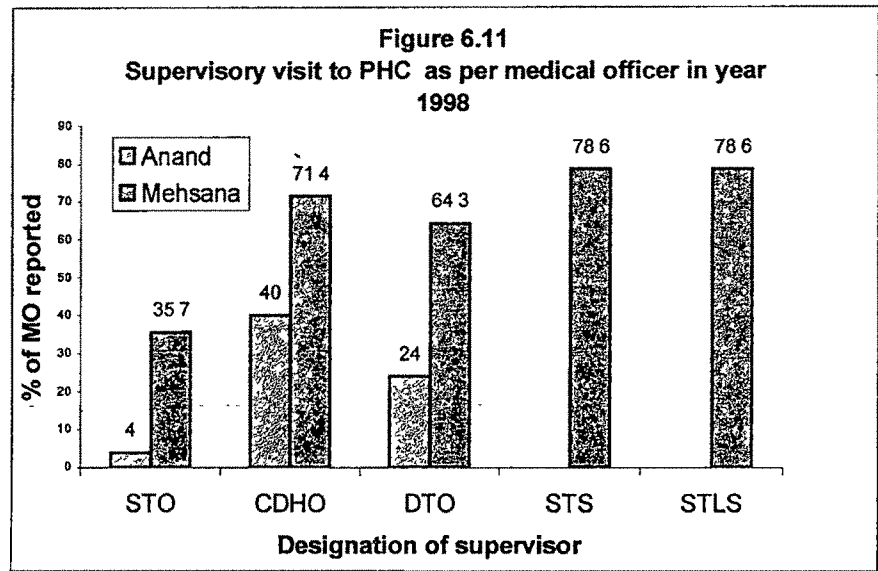
6.5.6 Supply of anti TB drug:

80%(20/25) MO in Anand and 100%(14/14) MO in Mehsana had reported that the anti TB drugs supply throughout the in 1998 was sufficient in quantity. While 20% of MO in Anand ware reported insufficient or no supply of anti TB drugs to their PHC (Table 5.4.16).

6.5.7 Availability of TB Control Programme module/ manual:

4%(1/25) MO in Anand and 92.9% (13/14) MO in Mehsana had reported that they were having National TB Control Programme module/ manual at their institution (Table 5.4.5)

While 0%(0/52) health worker in Anand and 77.3%(51/66) health worker in Mehsana reported that they were having National TB Control Programme module at their institution (Table 5.5.2).

The observed difference was statistically significant. It could be due to availability of module on account of RNTCP at Mehsana.

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6.5.8 DOTs implementation:

A TB patient, who go for treatment is less likely to adhere to treatment. The only proven way of insuring adherence and achieving WHO global target is through directly observation of treatment (WHO 1997). One of the aims of TB Control Programme was to organize TB services in a way, so the patient has TB treatment as close to home as possible. Patients who live close to health facilities (e.g. Health centre, district hospital), the supervisor who directly observed treatment will therefore be one of the health staff at the health facility e.g. Pharmacist. Patients live away from a health facility, the DOT provider will be health out reach worker or a trained local community volunteer. .

In the present study, 25 TB patients were on RNTCP regimen and received treatment under direct observation (DOT). 95.7% (22/23) TB patients were taken the anti TB drug in presence of DOT workers at Mehsana. The pharmacist 81.8%(18/22), followed by health worker 13.6%(3/22) and ICDS worker 4.5%(1/22) were the health personnel who were working as a DOT provider (Table 5.2.24).

The health care provider was also reported about the person, who provides the DOTs in their area. We found that 66.6% health workers in Mehsana and 100%(52/52) health workers in Anand reported that the pharmacist provide the TB treatment at primary health centre level (Table 5.5.20).

While 80.8%(54/66) of para-medical health personnel's in Mehsana reported that the health worker provide the DOTs treatment at the villages other than the PHC village. ICDS worker/ helper, trained Dai, old TB patient, community volunteer also supervised the DOTs treatment in absence of health worker (Table 5.5.20).

In another study, 73.5% of TB patients received the actual supervised DOT treatment in RNTCP project at Pathanamthitta district of Kerala state (Balasubramanian 1999).

6.5.9 BCG vaccination & Health worker:

92.3%(48/52) para-medical health personnel in Anand and 98.5%(65/66) para-medical health personnel in Mehsana were aware about the availability of BCG vaccine at their PHC (Table 5.5.8). 75.8%(25/33) health worker (HW) in Anand and 66.7%(22/33) HW in Mehsana, who were responsible for BCG vaccination, were trained in BCG vaccination (Table 5.5.9).

Knowledge of BCG vaccination among the health workers who gave vaccination, regarding age of child and site of vaccination was 54% in Anand v/s 90% in Mehsana.

6.6 TB treatment cards and record keeping:

Each patient, who begin treatment for tuberculosis has a treatment card. This card contains important information about patient. Such as name, age, sex, address of patient, type of disease, regimen prescribed, duration of treatment, amount of drug to be given, result of sputum smear examination (initial and during treatment), and treatment out come.

All TB patients, who initiate treatment during year 1998 and belong to selected PHC area, were listed out in the present study. The treatment cards of these patients were collected and studied. The out come indicators were calculated on the basis of treatment cards. And comparison made with the quarterly report submitted by district during year 1998.

6.6.1 Availability of TB treatment cards:

60.6%(57/94) cards in Anand and 100%(118/118) cards in Mehsana district, the TB treatment cards were available at selected PHC. While 39.4%(37/94) TB treatment cards were not available at Anand (Table 5.6.1). The reason for non-availability as explained

by DTO was one of the NGO working in Anand keeping the TB patient records on out patient case paper and not on prescribed treatment card as per GOI. So such patient was not had treatment card.

6.6.2 **Investigation as per treatment cards:**

Sputum AFB examination: The result of sputum smear AFB examination was noted in all the treatment cards in both the districts except one patient in Anand (Table 5.6.4). 61.1%(33/54) in Anand and 69.8%(81/116) in Mehsana, the treatment cards belong to smear positive TB patients. While rest was negative by smear AFB examination (table5.6.3).

- **X-ray chest examination:** The X-ray chest was recommended in a chest symptomatic patient, who was sputum AFB negative and not responded with a course of antibiotic except in a condition needed immediate surgical intervention (GOI 1997).

In the present study, the x-ray chest examination was conducted 30.3%(10/33) in Anand and 1.2%(1/81) in Mehsana, in a smear positive uncomplicated patient, which was not needed as per programme guidelines (Table 5.6.6).

The above discussion suggests that there was an unnecessary use of X-rays tool for diagnosis in Anand. There was an improvement in diagnostic procedure in Mehsana as comparison to Anand.

6.6.3 **Place of treatment as per TB treatment card:**

28.1%(16/57) of TB patients in Anand received treatment from DTC, while none was in Mehsana (Table 5.6.9). It suggests that the reference for continuation of treatment nearest to patient home was not done at Anand.

6.6.4 **DOTs Provider in Mehsana:**

33.1%(39/118) patients with health worker, 22.9%(27/118) patients from pharmacist, and 44%(52/118) patients from

community volunteer received the DOTs treatment in their presence (Table 5.6.10). The community volunteer belong to ICDS worker, social worker, old TB patient, trained dai, old CHV were presently working as DOT provider in Mehsana (Table 5.6.11).

6.6.5 Sputum smear follow-up activity:

Periodically, the sputum smear follow-up was recommended to watch the progress of patient during treatment. It was recommended at the end of intensive phase, 2nd months after initiation of continuation phage, and at the end of treatment.

In present the study, 22.8%(13/57) in Anand and 55.1%(65/118) in Mehsana had completed the first sputum follow-up (end of I.P.) in time (Table 5.6.13). The rest 33.3%(19/57 in Anand and 31.3%(37/118) in Mehsana, had given sputum for follow-up late, but 21.1%(12/57) in Anand the first follow-up was not done (Table 5.6.13). Similar observation also made with 2nd and 3rd follow-up (Table 5.6.13). It suggests that there was a significant improvement in follow-up activities in Mehsana as compared to Anand.

6.6.6 Conversion rate:

The sputum smear conversion rate is a very sensitive indicator. It gives the information about the efficacy of TB treatment. In the present study, the conversion rate was calculated on the basis of treatment cards studied. The conversion rate was 65.5%(19/29) in Anand and 79.1%(34/43) in Mehsana in a new smear positive TB patient at the end of 3rd months The conversion rate was compared with conversion rate reported by DTC in quarterly report for year 1998. The result of comparison was shown in Figure 6.12(a) & (b). The observed difference could be due to sampling variation or under or over reporting by DTC in quarterly report submitted to state.

6.6.7 Treatment out come:

The treatment outcome of new smear positive TB patient was . calculated. It shows that the cure rate was just doubled in Mehsana as compare to Anand. The default rate was 4.6% in Mehsana as compared to 44.8% in Anand (table 5.6.15). The comparison of out come results was made with the quarterly repot submitted to state. The results are shown in Figure 6.12(a&b).
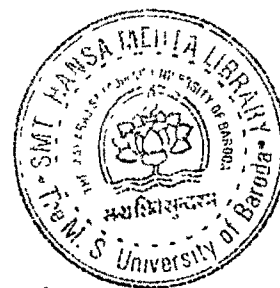

Figure 6.12(a)
Treatment outcome of new smear positive TB patients in Anand

Figure 6.12(b)
Treatment outcome of new smear positive TB patient in Mehsana
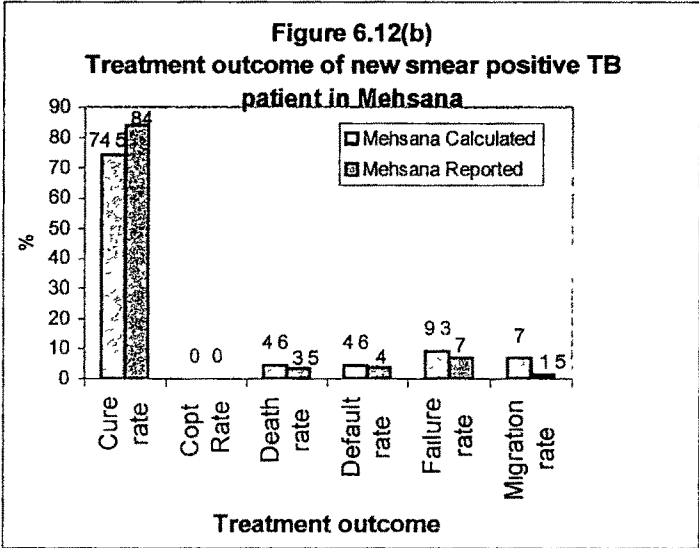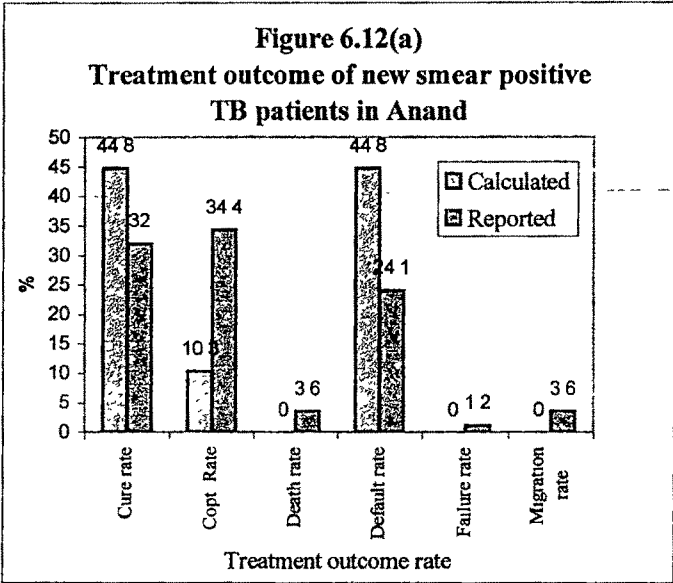
The summary of process and outcome indicators calculated was as follows:

6.6.8 Process indicator:

Sr. No.	Indicator	Value Expected As per G.O.I	Calculated value	
			Anand	Mehsana
1	**Training-** (a) Proportion of Para-medical health personnel trained or retrained for TB control programme in previous 3 years	100%	23.1%	89.3%
	(b) Proportion of health workers responsible for BCG vaccination, who were trained or retrained in BCG vaccination technique in previous three years.	100%	75.8%	66.7%
	(c) Proportion of medical personnel, who were trained or retrained for TB control programme in previous three years.	100%	16%	85 7%
2	**Supervision** (a) Proportion of HW, who report that one or more visit by their immediate supervisor (MO) in previous 3 months for TB control activities	100%	26.9%	72.7%
	(b) Proportion of medical officer, report that one or more supervisory visit of DTO in previous one year for TB control programme	100%	24%	64.3%
3	**Health information systems** (a) Proportion of health institution submitted monthly monitoring reports during last one year	100%	100%	100%
	(b) Proportion of medical officer, who report that they received feedback of monthly monitoring report with in three months of their submission	100%	7%	92 9%

Process indicator - continue

Sr. No.	Indicator	Value Expected As per G.O.I	Calculated value	
			Anand	Mehsana
4	**Drugs-supply** (a) Proportion of medical officer, who report that the supply of anti -TB drugs was in sufficient quantities during last one-year period.	100%	80%	100%
5	**Health-education** (a) Proportion of TB patients, who report that they know govt. Facilities located nearer to their house (PHC), where the diagnosis and treatment of TB available free of cost.	N.A.	7.1%	44.0%
	(b) Proportion of chest symptomatic patients, who report that they know govt Facilities located nearer to their house (PHC), where the diagnosis and treatment of TB available free of cost.	N.A.	13.6%	51.0%
	(c) Proportion of health worker who know correctly the nearest govt. health facilities where the diagnosis of TB is available.	N.A.	42.3%	90.9%
	(d) Proportion of health worker who know correctly the nearest govt. health facilities where the treatment of TB is available.	N.A.	28.8%	90.9%
	(e) Proportion of medical health care provider (MO), who received the TB training, report correctly about national TB regimen	N.A.	50%	58 3%
	(f) Proportion of medical health care provider (MO), who did not received the TB training, report correctly about national TB regimen	N A	14.3%	50%

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6.6.9   Out-come indicator

Sr. No.	Indicator	Value Expected As per G.O.I	Calculated value	
			Anand	Mehsana
1	**Case finding activities**			
	(a) Proportion of chest symptomatic suggestive, of TB, seeking medical advice for early detection out of total symptomatic in community.	N.A.	76.8% (96/125)	83.5% (86/103)
	(b) Proportion of chest symptomatic suggestive of TB seeking medical advice from govt. facilities for early detection, out of total who seek the medical advice	N.A.	28.1% (27/96)	20.9% (18/86)
	(c) Proportion of chest symptomatic, seeking medical advice from health care provider, who reports that, his health care provider advice for sputum AFB examination	N.A.	20.8% (20/96)	29.1% (25/86)
	(d) Proportion of chest symptomatic, seeking medical advice from health care provider, who reports that, his health care provider advice for X-ray chest after the sputum AFB examination.	N.A.	2 1% (2/96)	2.3% (2/86)
	(e) Proportion of TB patients, who report that they had first visited to govt. facilities for their symptoms.	N.A.	25% (35/140)	28.6% (26/91)
	(f) Proportion of smear AFB positive TB patient. out of total chest symptomatic patient in community	N A.	10.9% (12/110)	9.2% (9/98)
2	**Treatment activities**			
	(a) Proportion of TB patients, who report that they received TB treatment from Govt. facilities out of total TB patients in community	N A	38.8% (54/140)	44 0% (40/91)
	(b) Proportion of TB patients, who report that they received TB treatment from Govt facilities and prescribed the National TB drug regimen	100%	85 2% (46/54)	90% (36/40)

Out-come indicator continue

Sr. No.	Indicator	Value Expected As per G.O.I	Calculated value	
			Anand	Mehsana
	Treatment activities (c) Proportion of TB patients, who report that they received RNTCP drugs regimen from govt. facilities, in presence of DOTS worker.	> 90%	N.A.	95.7% (22/23)
3	**Treatment outcome** (a) Sputum smear conversion rate at the end of three months in new smear AFB positive TB patients treated at govt. facilities	> 85%	65.5% (19/29)	79.1% (34/43)
	(b) Cure rate in new smear AFB positive TB patients treated at govt. facilities.	> 85%	44.8% (13/29)	74.5% (32/43)
	(c) Treatment completion rate in new smear AFB positive TB patients treated at govt. facilities	< 10 %	10 3% (3/29)	0.0% (0/43)
	(d) Default rate in new smear AFB positive TB patients treated at govt. facilities	< 10%	44.8% (13/29)	4 6% (2/43)
	(e) Failure rate in new smear AFB positive TB patients treated at govt. facilities	< 4%	-	9.3% (4/43)
	(f) Death rate in new smear AFB positive TB patients treated at govt. facilities	< 4%	-	4.6% (2/43)
	(g) Migration/ Transfer out rate in new smear AFB positive TB patients treated at govt. facilities.	<1%	-	7.0% (3/43)
4	**Mortality** (a) Crude Death Rate /Thousand/ year	-	11 33	8.7
	(b) TB mortality/ lakh/year	-	188	76
5	**Prevention & prophylaxis** (a) Proportion of children age 1-2 year of age BCG vaccinated as per their mother in community	-	72 4%	56.7%
	(b) Proportion of TB patient disposed their sputum hygienically.	-	2 9%	5 5%