CHAPTER IV

RESULTS

This chapter presents the findings of the data analysis. The study was composed of two study components; retrospective and cross sectional descriptive study. Therefore, the findings are presented into two main parts. The findings of retrospective study is subdivided into (1) description of characteristics of the subjects, (2) bivariate analysis of the data and (3) multivariable analysis of the independent and dependent variables. The findings of cross-sectional descriptive study on the health care system related to TB program are presented based on the general observation of health service delivery and setting, and answers from the health personnel responsible for the coordination of the TB program and the organization of the health service to the pre-structured questionnaire.

1. Findings of retrospective study

1.1 General characteristics of the study subjects

The description of general characteristics of the study subjects includes total number and proportion of subjects chosen in each health care setting, distribution of age, gender and occupation of the subject, duration from final diagnosis to treatment initiation, frequency and proportion of category of the regimen and disease classification, presence of side effect due to anti-TB drug and involvement of other disease than TB and substance abuse among the patients, treatment supervision status in each health setting and treatment outcome of the subjects.

Table 4.1: Number and proportion of subjects in each setting.

	No	%
Bangkok chest clinic	229	35.3
Health center	246	37.9
Private hospital	174	26.8
Total	649	100.0

As shown in the above table, during the study period from Oct 2001 to Sep. 2004, a total of 649 patients' records were reviewed, of which 229 cases (35.3 %) were from Bangkok Chest Clinic, 246 cases (37.9 %) from Coordinating Health Center No 4 and 174 cases (26.8%) from the Hua Chiew Private Hospital.

Table 4.2: Age distribution of the subjects

Characteristics (year)	15-30	31- 40	41-50	51- 60	61	Total
Frequency	216	175	127	70	60	648
%	33.3	27.0	19.6	10.8	9.2	100
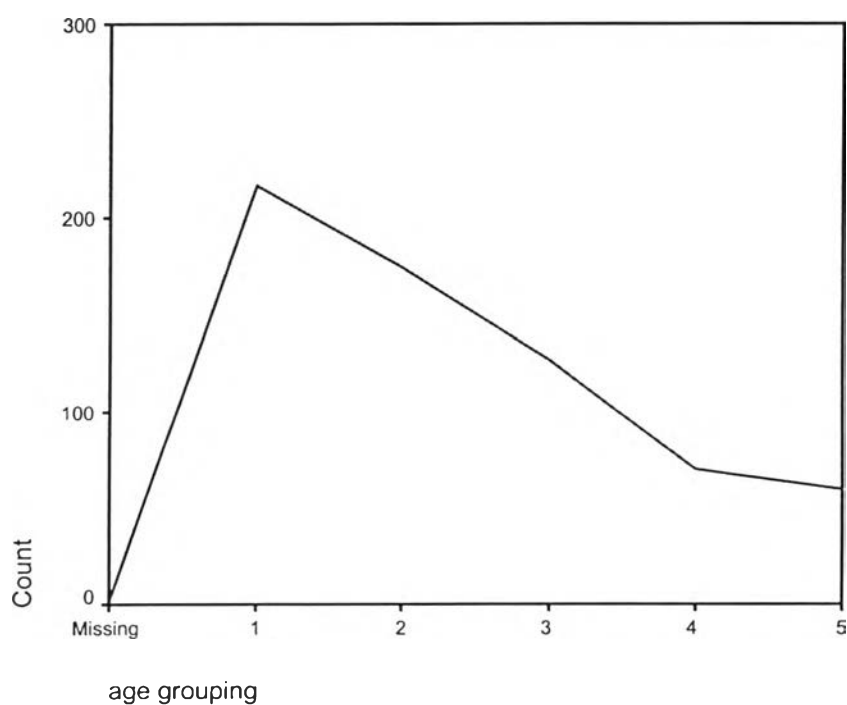
Figure 3: Age distribution of subjects

The age distribution of study subjects were the highest in the age group from 15 to 30 (33.3 %) and then shows descending trend with 27 % in aged 31-40, 19.6 % in 41-50, 10.8 % in 51-60 and 9.2 % in over 60 years old, as shown table 4.2.

Table 4.3: Gender distribution of the subjects

Characteristics	Male	Female	Total
Frequency	459	190	649
%	70.7	29.3	100.0

As presented in table 4. 3, 70.7 % of subjects were male and 29.3 % were female.

Table 4.4: Occupation distribution of the subjects

Characteristics	Frequency	%
Employed	294	45.3
Student	22	3.4
Merchant	63	9.7
Driver	43	6.6
No job	95	14.6
Retirement	41	6.3
Housewife	48	7.4
Others	20	3.1
No answer	23	3.5
Total	626	100.0

Most of the subjects were recorded on the TB card as being employed but detailed information about job category was not available.

According to the TB treatment card of the subjects, student, merchant and driver (Taxi or Motor cycle) were recorded separately from the employed, which were

respectively, 3.5 %, 9.7 % and 6.6 %. On the other hand, the subjects who had no job

were 14.6 % (table 4.4). In addition, the table presents 6.3 % of retired subjects, 7.4 %

of housewives and 3.1 % of others which include monk, police, security man, etc). The

occupation of 3.5 % of subjects did not have recorded occupation.

Table 4.5: Duration of treatment regimen initiation

	Frequency	%	Maximum	Minimum
1-7 days	567	87.3		
8-14 days	57	8.8		
Over15 days	18	2.8	28	1
No answer	7	1.1		
Total	649	100		

As presented in the table 4.5, 87.3 % of the patients were put on the treatment

regimen within 7 days (1 week). And 8.8 % of patients were from 8 to 14 days (2

week), the remaining 2.8 % were put on the regimen after final diagnosis. The

maximum duration of treatment initiation after final diagnosis was 28 days. The data for

0.8 % (5 cases) were not available on the treatment card.

Table 4.6: Distribution of category and classification of the subjects

		Frequency	**%**
Category I	N S+	341	52.5
	N S- Seriously ill	114	17.6
	N Extra pul-seriously ill	20	3.1
	Sub total	475	73.2
Category II	Relapse	22	3.4
	Failure	16	2.5
	Retreat after default	22	3.4
	Others	21	3.2
	Sub total	81	12.5
Category III	NS- non seriously ill	81	12.5
	N Extra pul non seriously ill	11	1.7
	Sub total	92	14.2
No answer		1	0.2
Total		649	100.0

(NS+ ; New Smear Positive, NS- ; New Smear Negative, N Extra pul ; New smear Extra pulmonary)

As shown above, 52.5 % of all patients treated in 3 settings were new smear positive cases. 73.2 % of patients which consisted of (52.5 %) new smear positive, (17.6 %) new smear negative seriously ill cases and (3.1 %) new extra-pulmonary seriously ill cases, were treated by Cat I regimen.

The patients treated by Cat II were 12.5 % of all subjects including (3.4 %) relapse, (2.5 %) failure, (3.4 %)treatment after default and (3.2 %) others.

Cat III cases were 14.2 % of all subjects consisting of (1.7%) new smear negative non - seriously ill cases and (14.2 %) new extra-pulmonary non- seriously ill cases. Category for 1 case was not available on the Treatment card.

Table 4.7:   Presence of side effect due to anti-TB drug

	Frequency	%
No side effect	542	83.5
Presence of side effect	107	16.5
Total	649	100
Nausea	32	4.9
Vomiting	24	3.7
Joint pain	13	2.0
Dizziness	10	1.5
Eye impairment	3	0.5
Itching and rash	58	8.9
Jaundice	6	0.9

As presented in the table 4.5, side effect due to anti-TB drug occurred among 16.5% subjects; nausea 4.9 %, vomiting 3.7 %, joint pain 2.0 %, dizziness 1.5 %, eye impairment 0.5 %, itching and rash 8.9 % and jaundice 0.9 %. Some patients developed two types of side effect together, which were not specifically analyzed.

Table 4.8: Involvement of other disease other than TB

	Frequency	%
No other disease	516	79.5
Presence of other disease	133	20.5
Total	649	100
Diabetes Mellitus	44	6.8
Hypertension	13	2.0
Heart disease	2	0.3
Asthma	2	0.3
HIV/AIDS	71	10.9
Others	13	2.0

(others ; anemia, peptic ulcer and renal disease)

20.5 % of patients had additional disease other than TB. 71 cases (10.9%) were recorded as having HIV/AIDS infection. In addition, Diabetes mellitus (6.8 %), hypertension (2.0%), heart disease (0.3%), Asthma (0.3%) and others (2.0 %) were the diseases involved with TB among the subjects. It was found that some patients had two other disease together such as Diabetes Mellitus and Hypertension. These were not separately analyzed because number of those was small.

Table 4.9: Substance abuse status among the subjects

	Frequency	%
No substance abuse	621	95.7
Substance abuse	28	4.3
Total	629	100
Drug abuse	27	4.2
Alcoholic	3	0.5

As shown in the above table, 4.3 % of subjects were substance abuser, out of whom 27 cases (4.2 %) were drug addict and 3 cases (0.5%) were alcoholic.

Two patients were both drug addict and alcoholic. However, they were not analyzed in independent group.

Table 4.10: Type of treatment supervision.

Type of supervisor	No	%
Health personnel	179	27.6
Family member	93	14.3
Self administration	376	57.9
No answer	1	0.2
Total	649	100

As above, 27.6 % of subjects were supervised by health personnel for their drug intake. 14.3 % were observed by family members (wife, mother, father, sister, brother husband, boyfriend and etc) when they took medication. However, 57.9 % took their medication by themselves.

Table 4.11: Treatment supervision status in each health setting

	BCC		HC		PH	
	No	%	No	%	No	%
Health personnel	3	1.3	176	71.5	0	
Family member	4	1.7	69	28.0	20	11.5
Self administration	222	96.9	1	0.4	153	87.9
No answer					1	0.6
Total	229	100	246	100	174	100

(BCC; Bangkok Chest Clinic, HC; Health Center, PH; Private Hospital)

As shown in the above table, in Bangkok Chest Clinic, 96.6 % were self administered and only 4 % were supervised by family member and 3 % by health personnel.

In Health center, 76. 5 % were observed by health personnel and 28 % by family member, and 1 case (0.4 %) was self administered.

In private hospital, 87.9 % were self administered and the remaining 11.5 % were supervised by family member.

Table 4.12: Treatment outcome

	Frequency	%
Treatment completion	450	69.3
Default	123	19.0
Die	18	2.8
Failure	23	3.5
Transfer out	33	5.1
No answer	2	0.3
Total	649	100

(treatment completion ; cure + completion)

As shown in the above table, 69.3 % of subjects completed their treatment without defaulting, while 19.0 % patients defaulted from the treatment. In addition, 2.8 % patients died during the treatment period and 3.5 % failed, and 5.1 % transferred out to another areas. The treatment outcome of 2 cases (0.3%) were not recorded on their treatment card.

1.2 Bivariate analysis of the independent and dependent variable of the study.

Bivariate analysis was used to find out whether there is any association between each independent variable and dependent variable .

Table 4.13: Association between and age and default

	Non-default frequency (%)	Default frequency (%)	Total frequency (%)	Chi-Square	*p* Value
15-30	175 (81.0)	41 (19.0)	216 (100)		
31-40	140 (80.9)	33 (19.1)	173 (100)		
41-50	102 (80.3)	25(19.7)	127 (100)	0.234	0.994
51-60	58 (82.9)	12 (17.1)	70 (100)		
Over 60	48 (80.0)	12 (20.0)	60 (100)		
Total	523 (81.0)	123 (19.0)	646 (100)		

As shown on the above table, age group "over 60" (20.0 %) defaulted from the treatment more than other groups, but its association between age and default was not significant statistically.

Table 4.14: Association between occupation and default

	Non-default frequency (%)	Default frequency (%)	Total frequency (%)	Chi-Square	*p* Value
Employed	250 (85.6)	42 (14.4)	292 (100)		
Student	20 (90.9)	2 (9.1)	22 (100)		
Merchant	45 (71.4)	18 (28.6)	63 (100)		
Driver	36 (83.7)	7 (16.3)	43 (100)	16.493	0.02
No job	69 (72.6)	26 (27.4)	95 (100)		
Retirement	31 (75.6)	10 (24.4)	41 (100)		
Housewife	42 (87.5)	6 (12.5)	48 (100)		
Others	15 (75)	5 (25)	20 (100)		

As presented in the above table, default rate of Merchant (28.6 %), patients who did not have job (27.4 %) and retired patients (24.4 %) were higher than other patients. Occupation was significantly associated with default (*p*- value; 0.02)

Table 4.15: Association between gender and default

	Non-default frequency (%)	Default frequency (%)	Total frequency (%)	Chi-Square	*p* Value
Male	357 (77.9)	101 (22.1)	458 (100)		
Female	167 (88.4)	22 (11.6)	189 (100)	9.421	0.02
Total	524 (81.0)	123 (19.0)	647 (100)		

As shown in the above table, male patients (22.1 %) defaulted more than female ones, which revealed a statistically significant association by chi square test (*p*;0.02)

Table 4.16: Association between treatment initiation duration and default

	Non-default frequency (%)	Default frequency (%)	Total frequency (%)	Chi-Square	*p* Value
1-7days	458 (81.1)	107 (18.9)	565 (100)		
8-14days	45 (78.9)	12 (21.1)	57 (100)	0.219	0.896
Over 15 days	15 (83.3)	3 (16.7)	18 (100)		
Total	518 (80.9)	122 (19.1)	640 (100)		

As shown in the table 14, patients who initiated treatment regimen from 8th to 14th day after final diagnosis defaulted more than other cases (19.1 %, 19.7%). However, there was no statistically significant association with default.

Table 4.17: Association between presence of side effect and default

		Non-default frequency (%)	Default frequency (%)	Total frequency (%)	Chi-Square	*p* Value
Nausea	No	499 (81.1)	116 (18.9)	615 (100.0)		
	Yes	25 (78.1)	7 (21.9)	32 (100.0)	0.179	0.672
Joint pain	No	514 (81.1)	120 (18.9)	634 (100.0)		
	Yes	10 (76.9)	3 (23.1)	13 (100.0)	0.142	0.706
Itching and rash	No	477 (80.8)	113 (19.2)	590 (100.0)		
	Yes	47 (82.5)	10 (17.5)	57 (100.0)	0.087	0.768
Dizziness	No	516 (81.0)	121 (19.0)	637 (100.0)		
	Yes	8 (80.0)	2 (20.0)	10 (100.0)	0.006	0.936
Eye impairment	No	521 (80.9)	123(19.1)	644 (100.0)		
	Yes	3 (100.0)	0	3 (100.0)	0.707	0.40
Vomiting	No	507 (81.4)	116 (18.6)	623 (100.0)		
	Yes	17 (70.8)	7 (29.2)	24 (100.0)	1.67	0.196
Jaundice	No	520 (81.1)	121 (18.9)	641 (100.0)		
	Yes	4 (66.7)	2 (33.3)	6 (100.0)	0.907	0.369

As shown in the above table, the most common side effect developed among defaulter was vomiting (29.2%), nausea (21.9 %) and joint pain (23.1%), but there was no significant association between presence of side effect and default.

Table 4.18: Association between other involved disease and default

		Non-default frequency (%)	Default frequency (%)	Total frequency (%)	Chi-Square	*p* Value
Diabetes Mellitus	No	488 (80.9)	115 (19.1)	603 (100.0)	0.021	0.885
	Yes	36 (81.8)	8 (18.2)	44 (100.0)		
Hypertension	No	511 (80.6)	123 (19.4)	634 (100.0)	3.114	0.885
	Yes	13 (100.0)	0	13 (100.0)		
Asthma	No	522 (80.9)	123 (19.1)	645 (100.0)	0.471	0.493
	Yes	2 (100.0)	0	2 (100.0)		
Heart disease	No	522 (80.9)	123 (19.1)	645 (100.0)	0.471	0.493
	Yes	2 (100.0)	0	2 (100.0)		
HIV/AIDS	No	478 (83.0)	98 (17.0)	576 (100.0)	13.595	0.000
	Yes	46 (64.8)	25 (35.2)	71 (100.0)		
Others	No	423 (81.7)	95 (18.3)	518 (100.0)	0.971	0.324
	Yes	12 (92.30	1 (7.7)	13 (100.0)		

HIV / AIDS positive cases (35.2 %) defaulted more than others with strong significance(p-value ; 0.00). Other disease involvement such as Diabetes Mellitus, Hypertension, Asthma, heart disease and others were not significantly associated with default.

Table 4.19: Association between treatment category and default

	Non-default frequency (%)	Default frequency (%)	Total frequency (%)	Chi-Square	p Value
Cat I	382 (80.6)	92 (19.4)	474 (100.0)		
Cat II	66 (81.5)	15 (18.5)	81 (100.0)		
Cat III	76 (82.6)	16 (17.4)	92 (100.0)	0.218	0.897
Total	524 (81.0)	123 (19.0)	647 (100.0)		

As shown in the above table, cat I patients (19.4%) were more defaulted from the treatment but not statistically significant.

Table 4.20: Association between smear positive cases and default

	Non-default frequency (%)	Default frequency (%)	Total frequency (%)	Chi-Square	p Value
Smear positive	274 (80.6)	66 (19.4)	340 (100.0)	0.075	0.784
Non-smear positive	250 (81.4)	57 (18.6)	307 (100.0)		

As shown in the above table, 19.4 % smear positive cases were defaulted from treatment, but there was no significant association with default.

Table 4.21: Association between type of treatment supervision

	Non-default frequency (%)	Default frequency (%)	Total frequency (%)	Chi-Square	p Value
Health personnel	144 (80.4)	35 (19.6)	179 (100.0)	1.124	0.570
Family member	79 (84.9)	14 (15.1)	93 (100.0)		
Self administration	300 (80.2)	74 (19.8)	374 (100.0)		
Total	523 (81.0)	123 (19.0)	646 (100.0)		

As above, self administered patients defaulted more from the treatment (19.0%),but not significant statistically.

Table 4.22: Association between substance abuse and default

		Non-default frequency (%)	Default frequency (%)	Total frequency (%)	Chi-Square	p Value
Drug addict	No	511 (82.4)	109 (17.6)	620 (100.0)	19.737	0.000
	Yes	13 (48.1)	14 (51.9)	27 (100.0)		
Alcoholic	No	522 (81.1)	122 (18.9)	644 (100.0)	0.402	0.526
	Yes	2 (66.7)	1 (33.3)	3 (100.0)		

As presented in the above table, drug addiction was significantly associated with default. (p-value; 0.00)

Table 4.23: Association between type of health setting and default

	Non-default frequency (%)	Default frequency (%)	Total frequency (%)	Chi-Square	p Value
BCC	187 (81.7)	42 (18.3)	229 (100.0)	0.928	0.616
HC	202 (82.1)	44 (17.9)	246 (100.0)		
PH	135 (78.5)	37 (21.5)	172 (100.0)		

As shown in the above table, default rate in Bangkok chest clinic was 18.3 %, Health center 17.9 % and Private hospital 21.5 %. Although the private hospital had a higher default rate, there was no statistical significance between type of health care settings and treatment default.

1.3 Multivariate analysis of independent and dependent variables

Bivariate analysis of independent variables and dependent ones reveals whether or not there is any association between independent and dependent variables. However, it doesn't tell the strength of associations between various independent and dependent variables. Therefore, multivariable analysis can be used to explore the strength of associations between more than 2 independent and dependent variables.

In case where dependent variable is dichotomous one, the binary logistic regression model is used. In this part of the findings, several independent variables such as age, occupation, duration from diagnosis to treatment initiation, treatment category, type of treatment supervision and type of health care setting were included in the binary logistic regression model. The results of the binary logistic regression are presented with Expected Beta values or Odds ratio along with p-value and coefficient value. The reference value which corresponds to the odds ratio 1 by definition is chosen in each variable by researcher based on the logic of the situation and characteristics of variable. The process of data analysis was done on the SPSS computer software version 11.0.

Table 21 shows the results of multivariable analysis using the logistic regression model applying all (21) independent variables to explore which variables are significantly associated with the dependent variable, which in this case is default from the treatment.

Table 4.24: Binary Logistic Regression analysis of all independent variables

Characteristics	Coefficient (B)	p-value	Odd ratio	95% CI
Gender				
Female®	-	-	-	
Male	**0.965**	**0.012**	**2.625**	**1.24-5.58**
Age group				
15-30®	-	-	-	
31-40	-0.212	0.541	0.809	0.41-1.60
41-50	-0.119	0.752	0.887	0.42-1.86
51-60	-0.313	0.504	0.731	0.29-1.83
Over 60	-0.298	0.685	0.742	0.18-3.13
Occupation				
Employed ®	-	-	-	
Student	-0.860	0.427	0.423	0.05-3.53
Merchant	**1.052**	**0.01**	**2.864**	**1.28-6.40**
Driver	0.409	0.41	1.506	0.57-4.00
No job	-0.298	0.685	0.742	0.87-3.73
Retirement	1.098	0.171	2.998	0.62-14.41
Housewife	0.832	0.178	2.297	0.69-3.70
Others	0.830	0.18	2.293	0.68-7.71
Duration of treatment				
Initiation				
1-7 days®	-	-	-	
8-14 days	0.214	0.624	1.238	0.53-2.91
Over 15 days	-0.27	0.72	0.764	0.17-3.33
Category				
Cat III®	-	-	-	
Cat I	0.132	0.73	1.141	0.54-2.40
Cat II	0.119	0.806	1.127	0.44-2.91

Table 4.24: (Cont.) Binary Logistic Regression analysis of all independent variables

Characteristics	Coefficient (B)	p-value	Odd ratio	95% CI
Supervision type				
Health personnel®	-	-	-	
Family member	-0.02	0.964	0.980	0.40-2.37
Self administration	0.643	0.502	1.903	0.29-12.44
Type of health setting				
Health center®	-	-	-	
BCC	-0.204	0.98	0.976	0.15-6.41
PH	0.335	0.732	1.399	0.21-9.56
Nausea				
No ®	-	-	-	
Yes	-0.587	0.401	0.556	0.14-2.19
Joint pain				
No®	-	-	-	
Yes	-0.441	0.607	0.643	0.12-3.45
Itching				
No®	-	-	-	
Yes	-0.368	0.449	0.643	0.27-1.80
Dizziness				
No®	-	-	-	
Yes	0.122	0.917	1.13	0.12-11.09
Eye impair				
No®	-	-	-	
Yes	-6.671	0.875	0.001	0.00-2.2 E+33
Vomiting				
No®	-	-	-	
Yes	1.133	0.112	3.105	0.77-12.56
Jaundice				
No®	-	-	-	
Yes	1.795	0.138	6.022	0.56-64.38

Table 4.24: (Cont.) Binary Logistic Regression analysis of all independent variables

Characteristics	Coefficient (B)	p-value	Odd ratio	95% CI
Diabetes Mellitus				
No®	-	-	-	
Yes	0.655	0.188	1.925	0.73-5.10
Hypertension				
No®	-	-	-	
Yes	-6.629	0.713	0.001	0.00-3.1E+12
Asthma				
No®	-	-	-	
Yes	-5.718	0.894	0.003	0.00-7.7 E+33
Heart disease				
No®	-	-	-	
Yes	-5.116	0.894	0.006	0.00–2.6 E+3
HIV/AIDS				
No®	-	-	-	
Yes	**1.138**	**0.003**	**3.119**	**1.46-6.68**
Others				
No®	-	-	-	
Yes	-1.542	0.914	0.214	0.02-2.19
Drug abuse				
No®	-	-	-	
Yes	**1.652**	**0.001**	**5.216**	**1.99-13.71**
Constant	- 3.319	0.000	0.036	

The model derived is Logit (Default) = − 3.319 + 0.965 (Male) − 0.212 (age group 31-40) − 0.119 (age group 41-50) − 0.313 (age group 51-60) − 0.298 (age group Over 60) − 0.86 (student) + 1.052 (Merchant) + 0.409 (Driver) − 0.298 (No job) + 1.098 (Retirement) + 0.832 (Housewife) + 0.83 (Other jobs) +0.214(treatment initiation 8-14 days) − 0.27 (treatment initiation Over 14 days) + 0.132 (Category I) +0.119(Category

II) – 0.02 (supervision by family member) + 0.643 (self administration) – 0.204 (Bangkok chest clinic) + 0.335 (Private Hospital) – 0.587 (Nausea)-0.441 (Joint pain)–0.368 (Itching) + 0.122 (Dizziness) – 6.671 (Eye Impairment) + 1.133 (Vomiting) + 1.795 (Jaundice) + 0.655 (Diabetes Mellitus)– 6.629(Hypertension)–5.718(Asthma) – 5.116 (Heart Disease) + 1.138(HIV/AIDS positive) –1.542(other involved diseases) +1.652(Drug addict).

As shown in the above analysis results, 'gender' 'HIV/AIDS positive', 'Merchant patients' and 'Drug addicts' were significantly associated with treatment default of the patients.

Male gender was significantly associated with treatment (p-value ;0.012). The model shows that the male subjects were 2.6 times more likely to default from the treatment than female.

The merchant patients were also significantly associated with default (p-value;0.01). They were 2.86 times more likely to default from the treatment than others.

The HIV/AIDS positive status of subjects had a highly significant association with treatment default (p-value;0.003) and contribute to the defaulting of the patients with 3.119 more chances than those who were HIV negative.

The drug addiction were also significant associated with treatment default. (p-value;0.001) and addiction were more likely to default from the treatment than others who were not addicted to drugs (Odds ratio ; 5.216)

Table 4.25 presents the results of sensitivity logistic regression analysis by including only those independent variables which were significant in the bivariate analysis. They were gender, occupation, HIV positive status and drug abuse.

Table 4.25: Binary logistic regression analysis of gender, occupation, HIV/AIDS positive, and drug abuse

Characteristics	Coefficient (B)	p-value	Odd ratio	95% CI
Gender				
Female®	-	-	-	
Male	**0.696**	**0.007**	**2.005**	**1.21-3.32**
Merchant	**0.680**	**0.027**	**1.975**	**1.08-3.61**
HIV/AIDS				
No®				
Yes	**0.850**	**0.003**	**2.34**	**1.34-4.10**
Drug abuse				
No®	-	-	-	
Yes	**1.343**	**0.001**	**3.821**	**1.70-8.12**
Constant	-2.449	0.000	0.105	

The model is Logit (Default) = –2.449 + 0.696 (Male) + 0.68 (Merchant) + 0.85 (HIV positive) + 1.343 (Drug addict).

The table shows the four factors associated with treatment default ; male gender (p-value ; 0.007), Merchant patients (p-value ; 0.027), HIV positive status (p-value; 0.003) and drug addiction (p-value; 0.001).

Male gender were more likely defaulted from treatment with 2.005 in Odds ratio and Merchant patients were more likely to default from the treatment than other occupation (Odds ratio ; 1.975).

HIV positive cases were also 2.3 times more likely to default from the treatment than negative ones and drug addicts were 3.821 times more likely defaulted than non-addiction ones.

In this model applying only variables which were significantly associated with treatment default, all four factors remained as significant independent determinants.

2. Analysis of Cross-Sectional Descriptive Study Results

Interviews with health personnel in 3 health care setting were performed based on a pre- structured questionnaire to identify the organizational factors contributing to the treatment default. Observation of the waiting hour of the patients were conducted at the above mentioned health settings.

2.1 Coordinating Health Center No 4.

This health center takes responsibility to coordinate 3 TB clinics which are located at health center No 3, 19 and 24. Each TB clinic has a TB coordinator (registered nurse) who has responsibility of recording and reporting of all data related to the program implementation, default tracing activity, health education for the patients and so on.

There is one doctor in each clinic who is responsible for clinical service for the patients. Therefore, doctors do not have sufficient information of the program implementation such as defaulter tracing, treatment observation, recording and reporting system, and supervision activity and so on.

There are two or three nurses in each clinic, but they have their own responsibility not related to the TB program.

Therefore, only TB coordinator in each clinic were interviewed using questionnaire.

2.2   Bangkok Chest clinic

First of all, the deputy director of chest clinic was interviewed to gather general information about health service organization and TB program implementation. He raised concerns about interviews with health personnel in the clinic because health service organization and TB program implementation are the main responsibility of director or deputy director while other health personnel know little about those things. Therefore, he mentioned that the answers from various health personnel might vary according to the respondents.

Therefore, interviews were conducted with director and deputy director of the Chest Clinic.

2.3   Hua Chiew Hospital

The Deputy director of the hospital was interviewed to gather the general information on the health service and TB program implementation. She said they withdrew from the TB program at the end of last year (2004) and gave each doctors the freedom to choose their own regimen for their patients.

One doctor who works at the universal coverage department said they withdrew from the program due to lack of fund supported from program management level and because there were too many documentation, forms and registers in the program. Even when they were involved in the program there was no specific unit for TB service. All doctors were treating TB patients within an integrated service package.

In this private hospital, there are three department such as internal medicine department, universal coverage department and social welfare department where TB service are delivered along with other health services. It was said that in the internal medicine department and social welfare department patients pay money or use health insurance for the service, while 30 baht scheme is used in the universal coverage department.

It was assumed that there might be little problem in terms of access to health service in Department where health services are paid. Therefore, the interview with health personnel and the observation of waiting time of the patient were observed only in the universal coverage department.

2.4 Findings

The tables below present the findings from each health care setting collected using the interview with health personnel and the observation of health service delivery process

Table 4.26: Characteristics of health service system related to TB program

Characteristics	BCC	H C	PH
Recording and reporting system	Yes	Yes	Yes
Defaulter tracing system	Yes	Yes	No
Supervision activity system	No	Yes	No
Incentive system	No	No	No
Health education system	Yes	Yes	Yes
Training system			
Training for new staff	Yes	Yes	Yes
Refreshment training	Yes	Yes	Yes
One stop service			
Microscopy service	Yes	Yes	Yes
X –ray service	Yes	Yes	Yes
Drug supply			
Government supply	Yes	Yes	Yes
Self purchase	No	No	Yes
Payment system			
Free of charge	Yes	Yes	No
30 baht scheme	No	No	Yes
social welfare	Yes	No	Yes
Self payment	Yes	No	Yes

As shown in the above table, Health center and Bangkok Chest Clinic have defaulter tracing systems while Private Hospital does not have such system. According to the interview with health personnel in health center and Bangkok chest clinic, the health center conducted home visits to the patients' house using transportation means of the clinic while in Bangkok chest clinic they did not conduct home visit due to the financial difficulty in affording transportation. However, they said that they currently purchased motorcycles for defaulter tracing activity using funds from Global Fund against AIDS, TB and Malaria.

It was said that health center had supervision system from program management level of the Bangkok Metropolis Administration through the designation of 6 coordinating health center sub served by 61 health centers and 85 sub-health centers distributed in six zones across the city for the quality functioning of the TB program. On the other hand, Bangkok chest clinic had no supervision system from external level since this clinic is under TB cluster of MoPH. Private hospital had no supervision system from the external program management level which should be emphasized from the nature of this hospital as a private hospital involved in public health program.

There was no incentive system to encourage defaulter tracing activity in the health care settings.

All three settings had health education systems for the TB patients and a training system for new staff. They also have refresh training system as well as microscope and X-ray machine to ensure the one stop service.

In the health center and Bangkok chest clinic, anti-TB drugs were received from the government level while in private hospital they received some amount of anti-TB drugs from the government and remaining amount of drugs required were purchased themselves. In the health center, all health services, anti-TB drugs and utilization of the equipment such as microscope and X-ray machine were free of charge, while in Bangkok chest clinic anti-TB drug was free but patients had to pay for utilization of microscope service and x-ray examination. In this setting if patients do not have money to pay for service, they can consult with a social worker to gain free service. In private hospital, three kinds of payment systems were used such as self payment, social welfare system, and 30 baht scheme.

Table 4.27: Flexibility of opening hours and workload of the health personnel

	BCC	HC	PH
Flexibility of opening hour	No	Yes	No
Vertical program	Yes	Yes	No

As shown in the above table, in the Health center they have flexibility in terms of opening hours of the clinic. According to the interview with TB coordinators, they open the clinic from 7 o'clock in the morning for the patients who have to go work from Monday to Saturday, while in Bangkok chest clinic and private hospital they do not have flexibility that for TB patients.

According to the interview with health personnel and observation of the health service delivery in 3 settings, Bangkok chest clinic and TB clinic in health center served only for TB patients, while private hospital served for all kinds of patients including TB patients.

Table 4.28: Average waiting hour of the patients in waiting space.

		BCC (N=45)	HC (N =34)	PH (N = 61)
Waiting hour (minutes)	Mean	14.07	4.13	21.67
	Maximum	30	15	10
	Minimum	5	1	45

According to the observation of the waiting time of the patients, average waiting time of the patients was 21.7 minutes in private hospital, 14.07 minutes in Bangkok chest clinic and 4.13 minutes in Health center. The waiting time of the patients was the shortest in health center.