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RESEARCH ARTICLE

CAUSES OF TREATMENT DEFAULT FROM REVISED NATIONAL TUBERCULOSIS CONTROL PROGRAMME (RNTCP) IN WEST BENGAL, INDIA

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ABSTRACT

Objectives: The present study explores who are those people discontinued from DOTS regime, had irregular compliance and why it happened so.
Methods: The study was conducted in 36 DMCs from 12 TUs of three districts in West Bengal, India. Information was collected from two groups – 590 DOTS defaulters from treatment registers and directly from 74 DOTS defaulters. Excluded people are those who were put on DOTS but did not complete full treatment or had anytime become defaulter. Factors were explored on the reasons of retrieval or non-retrieval of DOTS defaulter group and why a few persons became early defaulters and others late defaulters.
Results: Results indicated that only 12.4% could have been retrieved into DOTS treatment. Retrieval is influenced by literacy, employment and caste. Among defaulter respondents, knowledge about symptoms of tuberculosis is very poor. Percentages of higher stigma level (28-44) were more (62.2%) compared to lower stigma level (0-27) (37.8%). Mean duration of persons on DOTS is 26.9 days. Early defaulters (3-27 days) are 47.3% compared to delayed defaulters (28-90 days) 52.7%. People who have started DOTS have better knowledge and positive attitude towards health services meant for RNTCP. No socio-economic factors have significant relationship with the non-adherence to DOTS. However, long term therapy, side effects of drugs, no remedies for side effects, poor welcoming attitude of service providers are determinants of non adherence.
Conclusion: Finally the outcome of the present study recommends undertaking an in-depth study to explore causes of exclusion from adherence to DOTS when conventional determinants have been proved non-significant.

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INTRODUCTION

Tuberculosis (TB) continues to be the leading communicable disease and second most reason of death after AIDS (Herzog, 1998; NFHS III, 2005-06). It accounts for more deaths among women than all other causes of maternal mortality combined (TB India, 2012; Karim *et al*., 2007). Tuberculosis disproportionately affects poorer and marginalized sections of the society. Tuberculosis in developed countries has also historically been associated with poverty and low socioeconomic status (SES) (Olson *et al.,* 2005). India introduced the Revised National Tuberculosis Control Program (RNTCP) in mid-1990s for the prevention, containment, and cure of TB infections in the country through World Health Organization (WHO) endorsed Directly Observed Treatment Short Course (DOTS) strategy. The RNTCP currently works in conjunction with 'Stop TB Partnership' with a goal of worldwide reduction of TB prevalence by 50% by 2015 and less than one TB case per million population by 2050 (TB India, 2012). In 2013, World Bank has estimated total TB burden of India to be 2160 cases per million people.

In West Bengal, the detected TB burden is around 107225 and 90424 those had been put on DOTS regime respectively during 2008 and 2013 (Annual Bulletin of State TB Cell, 2013). In other words, in West Bengal during 2013, there are 904 detected cases of TB per million people. RNTCP provides free

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service with advanced protocols of examination, laboratory tests including highly effective DOTS therapy for the people susceptible or infected with tuberculosis (TB India, 2012). Compared with private provider's treatment cost, RNTCP is economic and effective also. However, people rely poorly on RNTCP. The private medical sector remains the primary source of health care for the majority of households in both urban areas at 70% and rural areas at 63% NFHS III, 2005-06. This is again compounded with neglect of social, psycho-social, cultural and political factors causing exclusion from services. Disregard or a lack of understanding for certain factors on the part of the health system can lead to voluntary and involuntarily exclusion of individuals from services, especially from the most vulnerable and marginalized sections of society, in lieu of meeting program goals (TB India, 2012). RNTCP's overarching objective is to "achieve and maintain a cure rate of at least 85 percent in new cases, and to achieve and maintain detection of at least 70 percent of sputum positive pulmonary TB patients" (Indian Institute of Health Management Research, 2003). Considered to be vertically-oriented, in the case of tuberculosis, the prevalence of the disease and an individual's ability to seek and complete an anti-TB treatment regimen is strongly linked with factors of his/her physical, social, and cultural environment. It is found that various caste and vulnerable groups consistently rank the lowest in having heard of the disease, having knowledge of its transmission, and believing that there is a cure (Indian Institute of Health Management Research, 2003.

Many socially excluded patients are at risk of delayed presentation, poor adherence, and loss to follow-up (Story *et al*, 2006). The risk of tuberculosis in groups of people migrating is highly variable and is influenced by several factors. Migrants are among these socially excluded groups (Wendy *et al*, 2000). The international tuberculosis policy package promoted by WHO and the International Union against Tuberculosis and Lung Disease (hereafter called the Union) is DOTS (WHO, 2003; Enarson *et al*, 2000). This strategy consists of five key elements, four of which are not contentious: political commitment; case detection by sputum smear microscopy, mostly among self-referring symptomatic patients; a system to ensure regular drug supplies; and a standard recording and reporting system, including the assessment of treatment outcomes. The fifth element—standard short-course chemotherapy administered under standardized case-management conditions, in which patients are directly observed daily to ensure drugs are taken—has been the subject of much debate (Volmink *et al*, 1997; Walley Garner *et al*, 2001; Pope DS *et al*, 2003; Wright et al, 2004; Zwarenstein *et al*, 1998 and Volmink, *et al*, 2003). The review concluded that the effects of directly observed treatment on cure or treatment conclusion were similar to those of self-administered treatment (Wright *et al*, 2004).

The aim of direct observation of treatment is two-fold: (1) to encourage patients to continue with treatment and identify those who miss treatment (WHO, 2004); and (2) to prevent resistance to rifampicin, the main antituberculosis drug. The Union recommends that direct observation should be undertaken by health workers (Enarson *et al*, 2000) and ample evidence is available to show that this strategy gives high success rates (WHO, 2004). However, direct observation of treatment is not suitable for areas with poorly accessible health services. WHO suggests that community volunteers might be appropriate treatment observers (WHO, 2003) and this idea has been successful in some settings (Clarke et al, 2005 and Wilkinson, 1994). Two concerns exist about these recommendations: (1) direct observation of treatment could reduce treatment seeking and completion because of the cost, inconvenience, and stigma associated with visiting a health centre or community volunteer daily; and (2) emphasis is placed on identifying when patients have defaulted from treatment rather than supporting them to complete treatment. To address these concerns, family-member observers have been tried and seem to be successful (Manders *et a*l, 2001 and Akkslip *et al*, 1999). Randomised controlled trials undertaken to assess the effectiveness of family observation (Wandwalo et al, 2004) have not been done under programme conditions, and at present the Union does not recommend the use of family-member observers. WHO's position on family-member observers is equivocal, with current recommendations stating that members of the patient's family should not serve as treatment observers (WHO, 2003). Organised community groups, peer groups, chosen members of the community, and family members all have the potential to act as supervisors. WHO has emphasized that research is needed to identify approaches suitable for areas with poor access to health services and continues to call for research on community contributions to tuberculosis care (Maher, 1999).

Chris Dye and colleagues, from the China Tuberculosis Control Collaboration, analyse the surveys estimated prevalence of pulmonary tuberculosis in the 13 provinces and was found 573 per 100 000 population in 1990, and fell to 298 per 100 000 population in 2000 (WHO, 2003); a reduction of 48% (95% CI 35—61). In the remaining 15 provinces, which were not supported by the World Bank (the municipalities of Beijing, Shanghai, and Tianjin were excluded from the analysis), the prevalence fell from 493 per 100 000 to 412 per 100 000; a reduction of 16% (1—35). On the face of it, DOTS brought about a 30% greater fall in tuberculosis prevalence than would have occurred had DOTS not been implemented (National Tuberculosis Programme, 2003). This reduction holds true if the same comparison is made for culture-positive or smear-positive tuberculosis instead of all pulmonary tuberculosis (defined radiologically) (Central Division, 2012). A great achievement for DOTS is claimed that 382 000 culture-positive and 280 000 smear-positive cases of tuberculosis have been eliminated from a population of more than half a billion children and adults (Squire *et al*, 2004).

The patient characteristics that were identified as a hindrance to treatment completion included social marginalization (abandoned or widowed mothers, alcoholics, poor, low caste); low level of integration in the city (new migrants, some women – especially newly married women from the villages who have come to their natal homes because of sickness); absolute poverty; past history of irregular treatment; and wage laboring which require regular trips out of the area. According to the NFHS-3 as education level increases, peoples' desire to keep tuberculosis a secret from their neighbors decreases, from 20.4 percent of men with no education as compared to 13.7 percent of men with more than 12 years of education. This level of secrecy is generally seen across all population subgroups. The

lack of understanding about the disease and its curability can dilute the possibility of a social support network for an individual that has tuberculosis. Percentage of new patients (smear positive) defaulted from DOTS was around 7% in three years 20011, 2012 and 2013 in West Bengal. Cure rate of new patients (smear positive) is around 83-84% during 2011, 2012 and 2013. Number of MDR TB patients is rising since last three years in West Bengal. In last four quarters of 2013, number of MDR cases in West Bengal was 260, 178, 414 and 381(Annual Bulletin of State TB Cell, 2013). Increasing trend of MDR cases are mostly due to default from DOTS and irregular compliance to DOTS.

The current study in this background, will try to explore determinants of DOTS default. It is important to explore who are those people discontinued from DOTS regime, had irregular compliance and why it happened so. When the case load is not coming down and nor the defaulter's rate, a study is therefore required to explore causes why people put on DOTS do not adhere to full regime and there is high defaulter's rate. The current study therefore will try to explore determinants of DOTS default. It is to explore who are those people discontinued from DOTS regime, had irregular compliance and why it happened so.

MATERIALS AND METHODS

Sampling design

Selection of district

In West Bengal there are 19 districts and out of which three districts – Birbhum, Jalpaiguri and North 24 Parganas were selected those geo-ethnographically represent the state. In our state there are three subdivisions – Jalpaiguri, Presidency and Bardhaman. From each sub-division one district has been selected, to capture maximum variations - Birbhum for Schedule tribe (ST) population, Jalpaiguri for ST and North 24 Pgs for Schedule caste (SC) and urban variations together with factors related to riverine variety.

Selection of Tuberculosis Unit (TU)

Each TU covers around 0.5 million population. A total of 12 TUs were selected – seven from North 24 Parganas, three from Jalpaiguri and two from Birbhum based on their population proportion. From each district TUs were listed. TUs have been notified based on certain criteria like urban/rural, SC/ST, minority and hard to reach areas. For North 24 Parganas, randomly one TU was selected from each criterion, for Jalpaiguri randomly three TUs were selected from first three criteria and for Birbhum two TUs were selected based on first two criteria.

Selection of Designated Microscopy Centre (DMC) and DOTS Providers

Each DMC covers 0.1 million population. Under the selected TUs again following above procedure; three DMCs were selected from each TU. Therefore a total of 36 DMCs were selected. From each DMC, list of DOT providers were prepared. Randomly from the list, one DOT providers were selected. Thus 36 DOTS Providers were selected.

Sample size and selection of respondents

Register of DOTS maintained by DOTS Supervisor was verified for last three years on and before 30th June, 2014. Around 4300 cases were identified and information was collected based a prefixed questionnaire. During editing of data, only 590 cases were identified those had all relevant information required for the study. Information for each case was collected based on data recorded in the register and also through personal contact of the DOTS Supervisor with the patients. Only defaulters were identified and information was collected. From North 24 Parganas, 74 persons who were defaulters of DOTS were interviewed from 3 TUs and 12 DMCs based on availability of information from Senior Technical Supervisor (STS). Ten DOTS providers and 10 DOTS defaulters were interviewed using open ended questionnaire to explore causes of non adherence to therapy.

Data analysis

IBM SPSS statistics software version 16.0 was used for statistical analysis. Statistical tests for significance applied for analysis have been indicated where relevant.

Ethical consideration

Standard ethical permission for human studies was obtained from all concerned authorities before commencement of the study. Department of Health and Family Welfare, Government of West Bengal was given formal permission to conduct such study within the community.

RESULTS

Findings from services register of DOTS

Profile of the respondents

Table 1 show that total of 590 cases have participated in this study out of which 34.6% belong to general caste, Other Backward Class (OBC) 12.9%, Scheduled Caste 21.7% and Scheduled Tribe 30.8%. Around 43.2% were unemployed, 25.4% daily wage labour and around 32% constitute either self employed or government employee. Around 21.0% participants are illiterate and 74.7% belong to below poverty line (BPL).

Table 1. Profile of the participants (caste, employment, literacy & poverty)

Group	%	Group	%	Group	%	Poverty	%
General	34.6	Unemployed	43.2	Illiterate	21.0	APL	25.3
OBC	12.9	Self employed	28.0	Primary	19.2	BPL	74.7
Scheduled Caste	21.7	Govt. employee	3.4	Upper Primary	12.2		
Scheduled Tribe	30.8	Daily wage labour	25.4	Secondary	47.6		
Total	100.0	Total	100.0	Total	100.0	Total	100.0

Base: 590

Table 2 represents from the result of sputum examination, positivity rate was assessed. Low positivity was defined as presence of acid fast bacilli up to 99 in 100 fields. Any bacilli count above this was defined as high positive. In this study, only 12.4% participants who were ever defaulter were retrieved through the RNTCP. And 61.36% were low positive ad 38.64% were high positive. This indicates that around 39% patients reached facility in late or advanced stage of tuberculosis and opted for DOTS.

Table 2. Treatment retrieval and sputum positivity

Treatment retrieval	Percent	Sputum positivity	Percent
No	87.6	Low positive	61.36
Yes	12.4	High positive	38.64
Total	100.0	Total	100.00

Base: 590

Table 3 shows that Several factors those have been identified to significantly influence treatment retrieval of those patients who have been put on DOTS regime are literacy, employment and caste; but not age group, poverty level and sex do not significantly influence retrieval.

respondents; 26 (40.63%) persons, 35 persons (54.69%) and 13 persons (20.31%) belong to the age group of ≤30 years, 30-60 years and above 60 years respectively. The demographic and socio-economic characteristics are presented in Table 4. Different castes of participants took part in this study; General 47 (63.5%), Scheduled Caste 14 (SC, 18.90%), Scheduled Tribe 2 (ST, 2.9%) and Backward Class 10(OBC, 13.9%). Similarly there was a wide range of religions who participated; Hindu 56 (75.7%) and Muslim 18 (34.3%). Literacy wise distribution depicts that illiterate group constitutes 24 (32.4%) compared to the literate group 48 (67.6). Only 13 participants (17.6%) were employed.

Knowledge among the participants about tuberculosis symptoms

Among the participants 39 (52.7%) knew without probe that people with cough are susceptible to have tuberculosis. Similarly without any probe, 25 (33.8%), 32 (43.2%), 18 (24.3%), 9 (12.2%%) and 51 (68.9%) participants respectively could mention that cough more than or equal to two weeks,

Table 3. Factors influencing treatment retrieval

	% of treatment retrieved	% of treatment not retrieved	Total no	p
Illiterate	80.65	19.35	124	0.013
Literate	89.48	10.52	466	
	87.63	12.37	590	
Any type of employment	90.91	9.09	440	0.000
Daily wage labour	78.00	22.00	150	
Hindu	84.80	15.20	454	0.000
Others	97.06	2.94	136	
Up to 20 years	87.27	12.73	55	0.533
21-40	85.96	14.04	292	
41-60	89.05	10.95	201	
> 60 years	92.86	7.14	42	
APL	87.92	12.08	149	1.000
BPL	87.53	12.47	441	
Male	87.80	12.20	492	0.739
Female	86.73	13.27	98	
General	18.14	81.86	204	0.000
OBC	0.00	100.00	76	
SC	14.06	85.94	128	
ST	9.89	90.11	182	
Total	87.63	12.37	590	

Table 4. Demographic and socio-economic characteristics of the participants

Age group (year)	%	Sex		%	Marital status	%	Caste	%	Religion	%	Literacy	%
<= 30	40.63	Male	62.2	66	Married	78.4	General	63.5	Hindu	75.7	Illiterate	32.4
31-60	54.69	Female	37.8	8	Unmarried	21.6	SC	18.9	Muslim	24.3	Primary	33.8
>60 years	20.31		100	74		100	ST	2.7	Christian	0.0	Upper primary	10.8
Total							OBC	13.5		100	Secondary	9.5
							Others	1.4			Higher secondary & above	12.2

Table 5. Vulnerabilities of participants in respect to tuberculosis infection

Employment	%	Residence	%	Slum dweller	%	Migrant	%	Substance user	%	Poverty	
Employed	17.6	Urban	74.3	Yes	55.4	Migrant	43.2	Yes	75.7	APL	54.1
Daily wage labour	43.2	Rural	25.7	No	44.6	Permanent residence	56.8	No	24.3	BPL	45.9
Others	39.2		100		100		100		100	Total	100.0

Base: 74

Findings of interviews with DOTS defaulters

Profile of the respondents

There were 74 participants in this study out of which 46 (62.2%) were male and 28 (37.8%) were female. Among all the

night fever, weight loss, anorexia and haemoptysis (blood cough) are symptoms of tuberculosis. Naturally for these symptoms, the knowledge level came up when they were probed, which is evident from the Table 6. Finally, knowledge score on symptoms of tuberculosis was done based on six itemized questions. Maximum possible score is 6 and

minimum is 0. Mean score was 1.52 and therefore, in 0-2 and 3-6 scale, groups were made to define high and low knowledge score. Within the low scale, 68 (75.6%) participants lie. The result is depicted in the Table 6.

Table 6. Knowledge about tuberculosis symptoms

Item as a symptom	Knowledge yes without probe (N)	%
Knowledge about cough as a symptom	39	52.7
Knowledge about cough equal or more than two seeks as a specific symptom	25	33.8
Knowledge about night fever as a symptom	32	43.2
Knowledge about weight loss as a symptom	18	24.3
Knowledge about anorexia as a symptom	9	12.2
Knowledge about haemoptysis as a symptom	51	68.9
Knowledge score		
Low score (0-2)	41	55.4
High score (3-6)	33	44.6
Total	74	100

Table 7. Access to RNTCP health education services

Area	n	%
Home Visit	65	87.8
Attended health education session	17	23.0
Private physician	34	45.9

Table 8. Stigma about tuberculosis and stigma score

Items	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
Some people prefer not to have those with TB living in their community	20.3	20.3	52.7	6.8
Some people keep their distance from people with TB	18.9	23	48.6	9.5
Some people think that those with TB are disgusting	18.9	44.6	29.7	6.8
Some people feel uncomfortable about being near those with TB	12.2	25.7	55.4	6.8
Some people do not want those with TB playing with their children	12.2	32.4	41.9	13.5
Some people do not want to talk to others with TB	20.3	36.5	33.8	9.5

Table 9. Duration of DOTS therapy before default

No of days	n	%
Defaulter groups		
Early (3-27 days)	35	47.3
Delayed (28-90 days)	39	52.7
Total	74	100

It is evident from the following Table 7 that people who have been visited by any health worker through home visit is adequate and it is around 87.8%, but however, who ever attended the health education session is only 23.0% and who attended any private physician is around 45.9%.

Stigma about tuberculosis among DOTS defaulters

Stigma about tuberculosis was assessed through 11 question items in four categories of options like - strongly disagree, disagree, agree and strongly agree. The following Table 8 depicts burden of stigma among the respondents. Cumulative score was also assessed to determine the overall stigma level. For each stigma positive attitude score 4 was given and for stigma negative attitude 0 score was given. Total score could be 0 to 44 because for each item scale was from 0-4 (0 means no stigma and 4 means maximum stigma attached to the issue). Mean score was 27.2. In 0-27 (low stigma level) and 28-44 (high stigma level), distribution for higher stigma level was more 62.2% (46) compared to lower stigma score group 37.8% (28).

Duration of DOTS therapy

Persons who were defaulted from DOTS therapy were asked after how many days of therapy they were default.

Mean duration of persons on DOTS is 26.9 days and day wise distribution is plotted in the following Table 9. Based on this mea duration, lower category who defaulted before 28 days have been identified as early defaulter and those defaulted on 28 days or after are called delayed defaulters. It is seen that early defaulters are 47.3% (35) compared to delayed defaulter 52.7% (39).

Predictors of early and delayed default from DOTS

Table 10 shows that the analysis was done to find out predictors of defaulters. In doing this, defaulters were categorized into two groups – early and delayed defaulters. Significance of association using chi-square was calculated to see which factor significantly influence default either early or late. None of the factors like age, sex, religion, caste, family members, occupation, employment status etc significantly influence default.

Table 10. Predictors of early and delayed default from DOTS

Item	Early default from DOTS: n1 (%)	Late default from DOTS: n2 (%)	p value
Age group			
Up to 40 years	6	11	0.284
Above 40 years	29	28	
Caste			
General	25	22	0.229
Other lower caste	10	17	
Religion			
Hindu	26	30	1.000
Muslim	9	9	
Occupation			
Employed	5	8	0.552
Unemployed	30	31	
Family group			
Less family member<=3	13	14	1.000
More family member>3	22	25	
Sex			
Male	31	35	1.000
Female	4	4	
Marital status			
Married	29	29	0.411
Unmarried	6	10	
Poverty level			
APL	20	20	0.647
BPL	15	19	
Residence			
Urban	29	26	0.182
Rural	6	13	
Dweller in slum			
Yes	20	21	0.818
No	15	18	
Migration status			
In migration	19	13	1.000
Not migrated	16	26	
Any substance use			
Yes	27	29	1.000
No	8	10	
Knowledge score level			
Low	19	22	1.000
High	16	17	
Stigma level			
Low	11	17	0.341
High	24	22	
Attended private physician			
Yes	17	17	1.000
No	16	17	

DISCUSSION

There have been several experiments in understanding effects of Directly Observed Treatment Short Course (DOTS) on cure rate of patients suffering from tuberculosis comparing with community based therapy, home based therapy and others. In most of the experiments, results have shown better efficacy on DOTS i.e. where treatment is supervised. In China great achievement has been there through DOTS compared with community based therapy (Squire SB *et al*, 2004). However, organized community groups, peer groups, chosen members of the community, and family members all have the potential to act as supervisors. WHO has emphasized that research is needed to identify approaches suitable for areas with poor access to health services (WHO, 1997) and continues to call for research on community contributions to tuberculosis care (Maher D, 1999).

In Pakistan, 497 adults were enrolled with new sputum-positive tuberculosis. 170 were assigned DOTS with direct observation of treatment by health workers; 165 were assigned DOTS with direct observation of treatment by family members; and 162 were assigned self-administered treatment. The trial was done at three sites that provide tuberculosis services strengthened according to WHO guidelines for the purposes of the research, with a standard daily short-course drugs regimen. Within the strengthened tuberculosis services, the health-worker DOTS, family-member DOTS, and self-administered treatment strategies gave very similar outcomes, with cure rates of 64%, 55%, and 62%, respectively, and cure or treatment-completed rates of 67%, 62%, and 65%, respectively. Interpretation is that none of the three strategies tested was shown to be superior to the others, and direct observation of treatment did not give any additional improvement in cure rates. The effectiveness of direct observation of treatment remains unclear and further operational research is needed (Walley John D *et al*, 2004). Percentage of people defaulted from DOTS is around 7% in 2011, 2012 and 2013 in West Bengal. Number of MDR TB is rising since last three years (Annual Bulletin of State TB Cell, 2013). This is related to default from DOTS and our current study in a background, whether DOTS should be continued or not, is important to explore who are those people discontinued from continuous DOTS and had poor compliance.

Our study could identify factors those influenced default rate. They are literacy, employment and caste. RNTCP which is implemented through public health system is paying less consideration for the social, psycho-social, cultural and political factors that make tuberculosis endemic among poor and excluded population. Many socially excluded patients are at risk of delayed presentation, poor adherence, and loss to follow-up (Story A et al, 2006). In the interview of 74 defaulters, it has been revealed out that most of the socio-economic factors or vulnerability factors have more influence on the late defaulters groups. In other words, for most of the factors, defaulters are more concentrated towards delayed default groups. However, none of these factors those are either socio-economic, vulnerability related or else, have been found to be significantly associated with default either it is early or late. Hence, it implies that default is more for some other reasons than the socio-economic factors. In a study conducted by Government of India in 2012, out of all the respondents interviewed, only 15 per cent were aware of DOTS centre. The awareness about DOTS centre ranges from less than 1 per cent in Tamil Nadu to a high of 25 per cent in both Maharashtra and Haryana. It is 18.2% in West Bengal.

Only 20 per cent of the respondents believe that DOTS is the sure way to complete cure of TB. The % of respondents who were aware of this is less in all the states and ranges from a low of about 6 per cent respondents in Tamil Nadu and Madhya Pradesh to as high as 32 per cent respondents in Maharashtra. It is only 2.6% in West Bengal. About one – fourth of the respondents were aware that medicines are provided free under DOTS. This awareness is highest (47%) among respondents in Haryana and lowest (4%) among the respondents in Tamil Nadu. It is only 28.9% in West Bengal. The awareness of DOTS provider in the locality varied from none in Madhya Pradesh to as high as 18 per cent in Meghalaya and Andhra Pradesh. It is only 8.3% in West Bengal. About one – fourth of the respondents interviewed were aware of the consequences of not completing full course of TB treatment. The % of respondents who are aware varies from one state to another and

ranges from a low of 2 per cent in Chhattisgarh to a high of 76 per cent in Meghalaya. It is 19.0% in West Bengal. Government hospitals/doctors were the places where treatment was sought for those suffering from TB for 44 per cent of the TB patients. This was followed by 23% patients who reportedly received treatment from a TB hospital and another 21% patients have received treatment from a private clinic/private doctor. Only about 8 % patients had received the treatment from a DOT centre. More than six months of treatment for TB was reported for about 39 % of the patients while 31 % of the patients were reportedly given treatment for less than six months. Only 29% of the patients were reportedly given six months of treatment for cure of TB (Central Division, 2013).

Our in-depth interviews with the defaulters revealed out that side effects of the drugs are more important cause for default than any other causes. Long duration of treatment, treatment being observed, less remedies for curing side effects of drugs, loss of wages during the DOTS day are far more important factors than socio-economic or social issues related to default. Our study is therefore important in identifying that factors like caste, literacy, religion, region and even income status of people (above or below poverty line) are not important issues influencing adherence to DOTS therapy like many other studies. Stigma is also not attached to it. Those who have once detected to have tuberculosis and initiated on DOTS have overcome the social stigma. For them, factors for non-adherence are not social. Factors like people's laziness, apathy for long term therapy, no remedies for side effects and low of wages for migrant people seem to be more relevant affecting adherence to DOTS therapy. Due to these problems they are excluded from adherence to DOTS. Our study therefore, recommends for conducting an in-depth qualitative study to get more insight into the cause of exclusions from DOTS.

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