

## Prevalence of Tuberculosis in Devdaha Village Development Community of Rupandehi District

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**Abstract :** *The main purpose of the study is to find out the prevalence of tuberculosis in the community. This study provides data to generate a demographic and socio-economic profile of the population in sixteen villages of the Devdaha VDC. Secondary data were collected from the District Health Office (DPHO) and National Tuberculosis Centre (NTC). On the basis of community survey, the prevalence rate in the year 2004 was 3.88 per thousand persons. It was also found that the number of TB cases varied from the rich economic category, 0.93 per thousand in the middle and 19.52 per thousand among very-poor section of the population. This study also shows that estimated sputum-positive TB cases of prevalence rate ranged from 3.00 to 11.60 per thousand. Prevalence of all forms of TB in Rupandehi district is estimated to range from 12.59 to 48.74 per thousand using community survey data and available studies.*

**Key Words:** *Tuberculosis, Community survey, Estimated, Prevalence rate*

### Introduction

Tuberculosis (TB) continues to be one of the important health problems in Nepal in spite of great efforts made by the Nepalese government and international organizations to contain it. The various tuberculin surveys (from 1945 to 1992) in different ecological belts of Nepal have shown that about 45 per cent of the total population is infected with tuberculosis.

It is estimated that 80 thousand active TB cases have been registered and 45,000 new cases emerge each year, of which 20,000 are infectious-smear positive cases. This “infectious pool” has been perpetuated by the occurrence of 45 thousand new cases and 8,000 to 11,000 deaths each year (NMA, 2000). Annual Risk of Infection (ARI) is about 2 per cent in rural areas, and 4 per cent in urban areas. In Nepal, over 30,000 new cases of tuberculosis are diagnosed each year, representing over 66 per cent of estimated cases. The case notification rate is currently 50 per 100,000 for smear positive TB and 131 per 100,000 for all forms of TB (HMG/ NTP, 2000) with rates of infection four times higher in the urban areas than mountain area. It is seen that the rate of infection is low in the hill and mountain districts and high in the densely populated Terai region and vallies or cities. According to Crofton and Perra (1978), the prevalence rate of smear positive was 3.6 per thousand and Tuberculosis Control Project (1982) Nepal found it to be 3.6 cases per 1000 people by passive case-finding method. Likewise, it is estimated the prevalence rate of sputum positive-pulmonary tuberculosis cases to be 2 to 3 cases per thousand population (Bam, 1996).

Owing to the lack of proper reporting and recording system under the general health services, it is difficult to get the exact data on the TB cases. No community survey has been conducted in the study area or at the national level. It has been estimated that when the ARI is one per cent, there will be 50 new sputum-smear-positive cases per one lakh population (Styblo, 1985). Since the ARI in Rupandehi District is presently estimated to be 2 per cent, average annual incidence of sputum-positive TB cases should be 100 per one lakh population in a year (NTC, 2004). There were in all forty-eight (48) confirmed cases found in the community survey. On the basis of this study, the prevalence rate in the year 2004 was 3.88 per thousand persons.

### **Materials and Methods**

This study was conducted in Devdaha Village Development Committee which is located in the western Terai of Rupandehi District. It lies 15 km east of Butwal, and 40 km from the district head quarter in the same direction. It is situated at an elevation ranging from 100 meters to 11, 00 meters above sea level. After the construction of Mahendra and Siddhartha Highways in 1970, the new settlements have started that led to increase in the migration of people from hilly regions to this VDC.

The field study consisted of a baseline community survey to identify known pulmonary TB cases and persons with chest symptoms of pulmonary TB and socio-economic status of the study population. This phase provide data to generate a demographic and socio-economic profile of the population in sixteen villages with a population of 12,359 of 2195 households in the Devdaha VDC. On the basis of occupation, landholding pattern, and type of houses, they were stratified into four economic status of the households was taken as a crucial indicator of social position and status. Persons with symptoms suggestive of pulmonary, pulmonary TB were identified in this population by using the house to house survey method. 45 cases already diagnosed by different health institutions and under treatment were found. In addition, 30 persons with chest symptoms suggestive of pulmonary TB were identified during the survey and referred to diagnostic facilities available in the area under DOTS. 3 out of the 30 were diagnosed as pulmonary TB by the government programme, among them two were found to be sputum-positive TB cases by the local DOTS centre and one was radiological reported to be a sputum negative cases by the Zonal hospital. There were in all forty-eight (48) confirmed present cases found in the community survey.

The District Health Office (DPHO) and National Tuberculosis Centre (NTC) maintain official records of all TB cases registered with National TB Programme. The prevalence rate of registered TB cases has been calculated by dividing the number of registered cases in the official records by the total population. For the purpose of analysis of the situation, a record of nine years' 1994/95-2003/2004 has been reviewed. Qualitative

and quantitative data have been included, essentially required for this study. Social class and caste framework was used to analyse data. The quantitative data have been analyzed in a statistical package for social sciences (SPSS) programmes. Simple statistical methods such as percentage, mean, ratio, SD and chi-square test have been applied in the data analysis.

## Result

### Prevalence Rate in Devdha VDC by Community Survey

There were in all forty-eight (48) confirmed cases found in the community survey (Table 2). On the basis of this survey, the prevalence rate in the year 2004 was 3.88 per thousand persons. This is close to double the estimated annual prevalence rate of TB cases (1.98 per thousand) and more than twice the registered case rate (1.74/1000) by the District Public Health office (DPHO) in the entire District. The difference was highly significant (Chi-square value is 31.50,  $p=0.001$ ).

**Table 1: Prevalence of TB Cases by Community Survey (2003/2004)**

Type of TB Cases N/1000.		No /Total population (12359)/1000 Population		
New TB cases	38 (3.06)	Sputum Positive 27 (2.18)	Sputum Negative 10 (0.80)	Extra-Pulmonary 1 (0.08)
Re- treatment TB cases	10 (0.82)	10 (0.82)	-	-
Total	<b>48 (3.88)</b>	<b>37 (3.00)</b>	<b>0.80</b>	<b>0.08</b>
Break-up of the <b>Re-treatment TB cases</b>		Relapse	Failure	Return After Defaulter (RAD)
Prevalence per 1000 Population		4 (0.32)	1 (0.08)	5 (0.40)
				Total
				10

Table 1 also shows that of the 48 cases, 38 were new cases and 10 were re-treatment cases. Re-treatment cases were found in the community survey showing a rate of 0.82 per thousand persons. This is four times the registered retreatment case rate. Regarding the retreatment cases, the difference is also highly significant (Chi-square value is 22.46,  $p=0.001$ ). While relapse case rate is about more than two times the reported cases, failure rate is just double and Return After Defaulter (RAD) is thirteen times the reported rate (Table 3.4). Also the RAD rate was highly significant ( $P=0.001$ ). Since the number of cases in the community survey are small. Fisher's exact test was carried out and relapse case rate was found significant (p value at 0.05

level) where as failure rate was not significant. However, since it is based on a survey for chest symptomatic and that on anti-TB treatment, it is likely to be under-estimating pulmonary TB cases (missing the cases without worry-awareness of symptoms and extra-pulmonary TB).

### Prevalence Rate by Socio-Economic Status

Economic Group: It was found that prevalence rate was the highest in the very-poor (10.08), less in the poor (3.49) and least in the middle (1.97) and rich group (1.69). This was such a marked and clear gradient that it once again corroborates the understanding of TB as a disease of poverty. It is found repeatedly in all analyses across caste and sex sub-groups in this study.

### Occupational Pattern

Table 2 shows that daily wage labourers had prevalence rate of 12.12 per thousand, self-employed had a rate of 10.3 per thousand followed by the poor peasant group (9.8 per thousand). There are no present cases of TB under the service, petty business, and housewife categories.

**Table 2: Distribution of present TB Cases by Categories of Occupation**

Category	Total population	Number of cases(N)	TB cases per thousand
Labourers	1,402	17	12.12
Poor/Middle peasant	1,525	15	9.80
Self- employed	388	4	10.30
Cultivator	596	2	3.36
Service	1,296	0	0
Businessmen and agriculture	316	0	0
Underemployed/ Own housework female	885	0	0
Dependent<+60 age	377	4	10.60
Student	4,404	3	0.68
Under five Year	1,220	3	2.46
Total	12,359	48	3.88

### Caste, Economic Category, and Occupation wise Distribution

Contrary to expectations, the rate was higher in the dominant caste as compared to the tribal and dalit groups (Table 3). This difference in prevalence rate of TB is counter to expectation since dominant caste also has better economic status and power

within the rural society. This too requires further explanation. The dominant caste females (4 per thousand) also have higher rated than the indigenous groups (3.2) and higher than the Dalit (2.5).

**Table 3: Caste, Economic Category, and Occupation-wise Distribution**

**TB Cases (Present)**

Caste by occupation	Population	TB Cases Rate/1000 persons				Total N	Cases/1000 population	
		Very-poor	Poor	Middle	Rich			
Dominant	Labour	357	<b>65.0</b> (7)	<b>12</b> (3)	<b>0</b>	<b>0</b>	<b>10</b>	<b>28.00</b>
	Poor Peasant	643	<b>24</b> (1)	<b>12</b> (7)	<b>0</b>	<b>0</b>	<b>8</b>	<b>12.40</b>
	Cultivator	264	0	0	8.6(1)	4.1 (1)	2	7.50
	Self employed	1044	0	1.4 (1)	3.6(1)	0	2	1.90
	Student	2172	0	1.8 (2)	1.25(1)	0	3	1.30
	Dependent	987	3.3(1)	6.68 (3)	3.2(1)	0	5	5.00
	Total	5657	<b>19.52</b> (9)	<b>5.12</b> (16)	<b>2.40(4)</b>	<b>5.0</b> (1)	<b>30</b>	<b>5.30</b>
Indigenous	Labour	620	22.6 (5)	3.0 (1)	0	0	6	9.60
	Poor Peasant	709	0	9.0 (6)	0	0	6	8.40
	Self employed	722	0	4.95 (1)	4.54(1)	0	2	2.77
	Dependent	987	0	2.56 (1)	0	0	1	1.00
	Total	5038	<b>7.4</b> (5)	<b>2.9</b> (9)	<b>0.95(1)</b>		<b>15</b>	<b>2.98</b>
Dalit	Labour	424	5.0 (1)		0	0	1	2.30
	Poor Peasant	173	21.7 (1)	0	0	0	1	5.70
	Self employed	184	24.3 (1)	0	0	0	1	5.40
	Total	1664	<b>5.54</b> (3)	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>1.80</b>
Total			<b>10.08</b>	<b>3.49</b>	<b>1.97</b>	<b>1.69</b>	<b>48</b>	

**Number in Parentheses**

Therefore, this study next examines the possible social and occupational processes that could explain the paradox of dominant caste having highest prevalence rates. Life histories and occupational pattern of the group seem to offer an explanation.

The prevalence rate of TB was found to be the highest within the dominant caste group. The cross analysis of caste, class, and occupational group shows that majority of the cases were distributed among the very-poor labourers and poor peasants of the dominant caste group. Further, overall the dominant caste groups in labourer and poor peasant groups were less than among the Dalits and indigenous groups. Poor peasants and dependent age groups followed it (Table 3).

In summary, caste and class characteristics seem to have conditioned the degree of vulnerability of the group to TB. However, caste, economic factors, and class do not offer a complete explanation to the causality of TB. The social history, occupational pattern, division and nature of working process and social relationships that produce the prevalence of TB, were examined in the subsequent section to seek further explanation for how poverty and exploitation of workers leads to vulnerability to TB and what social processes lead to the greater vulnerability of the dominant caste.

**Discussion and Conclusion**

The present study reveals that the overall prevalence of TB in the community was 3.88 per thousand and among them three persons had infectious TB in every thousand population. However, this prevalence trend needs to be confirmed by a larger study. This study data is similar to Crofton and Percear (1976) study; the prevalence of smear-positive was 3.6 per thousand and National Tuberculosis Association (1980/1982) Nepal also found it to be 3.6 cases per 1000 people by passive case-finding method.

Further, it was found that the number of TB cases varied from the rich economic category, 0.93 per thousand in the middle and 19.52 per thousand among very-poor section of the population. This is in keeping existing literature (ICMR/NSS, 1958). However, contrary to expectations, findings from this study have shown that the rate was higher in the dominant castes as compared to the janjati and dalit groups. It was found that was 5.30 cases are prevalent per thousand among the dominant castes groups, where as 2.98 cases in janjati and 2.99 cases in dalit. Among the dominant caste very-poor prevalence rate is 19.52 cases per thousand while it was 5.12 cases per thousand in case of the dominants castes poor. The middle and rich group had prevalent rate of 2.30 and 2.40 respectively. Among the other social groups too, it was found that prevalence rate is the highest especially among very-poor, less poor and middle group and it is minimal among the rich. Thus, it was the dominant caste, very-poor, and males of age 15 -59 groups who were found to have higher prevalence rate than all other groups.

Mekeown (1979) has argued the reduction of the TB prevalence in the developed country cannot be explained in terms of the declining virulence of the bacillus, nor by improvements in medical technology, but it reflect societal changes. Moreover, a socio-economic/societal explanation would not only help us to explain the endemic nature of the TB problem in many underdeveloped societies/communities, but also help us to understand why there are pockets of high incidence of the TB in community today. For example, the TB rate among social group in this study found that very-poor group was 19.52 per thousand while that for rich group was only 0.93 per thousand of population. It is not the biological nature of these rural very-poor groups that produces such high levels of TB cases prevalence among them but also social conditions under which they live (e.g. Inequality or social exploitation and discrimination).

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