

Prevalence of Tuberculosis and Service Utilization in Conflict Affected Areas of Nepal

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Abstract

Introduction	The direct deaths from war are ranked among the top 12 most common causes of global mortality and are projected to increase to 8 th most common cause of mortality by the year 2020. There are growing scientific evidences on the association between civil conflict and Tuberculosis.
Objectives	The objectives of this study were to determine the prevalence of TB amongst TB patients, and explore whether the following factors differ and affect the utilization of TB services in the areas with and without civil conflict: a) level of civil conflict, b) physical availability, c) financial affordability, d) acceptability, and e) geographical accessibility.
Methods	A cross sectional study with quantitative research method was used in this study. Two Districts implementing the WHO recommended strategy DOTS were purposively selected for this study. The districts namely Lalitpur as the non-conflict area (NCA) and Dang as the conflict area (CA) were selected for this study. The questionnaire survey was implemented among 180 TB patients (+ve cases); from each study area.
Results	During the conflict, the prevalence of TB has been found to be increased. Logistic regression showed that utilization of TB services was statistically associated with: satisfaction with the services provided (P-value .022), health facilities within walking distance (P-value .014) and killings happened in the family or community (P-value .016).
Conclusion	It is acknowledged that an extensive study with larger samples, wider time span and a use of a multidisciplinary study team would be crucial to establish nationally representative references.
Key words	TB, DOTS, Utilization, and Civil conflict

Introduction

As a result of conflict, directly or indirectly 191 million people lost their lives in the 20th century¹. More importantly, for every combatant killed in war, there is one non-combatant who dies as the result of war. The inescapable issue in public health is that when one combatant dies, additional 14-15 civilians lose their lives from loss of shelter, food, water, infectious disease epidemics and other diseases or deformities^{2,3}. In addition, a study conducted in Sierra Leon identified that 62 percent of rural units were not functioning during the conflict⁴.

The treatment process, treatment period and route of transmission of TB are the key aspects that need to be managed properly. In order to improve the utilization of DOTS services public and private partnership has been

taken as an important indicator^{5,6}. A study carried out in Guinea Bissau identified that TB mortality rate among the war cohort is 3 fold higher than for the peace cohorts⁷. The World Bank reported that civil conflict is both a cause and a consequence of poor economic performance of the country⁸. On average, the per capita output falls by more than 2 percent a year during civil wars. Economic and social systems are disrupted, famine and epidemics may follow, and resources are diverted to the military rather than to health and, thereby wars become a public health problem^{9,10,11}.

Introduction of DOTS has reduced the numbers of deaths; however 8,000-11,000 people (out of 23.5 million) continue to die every year from TB in Nepal^{12,13}. The institutions involved in the TB service

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delivery reported that the escalating civil conflict had been affecting the TB service delivery system in their respective working areas¹². In Nepal, on February 13, 1996, the Maoist insurgency started with an attack on Small Farmers Development Bank of Chyangli Village Development Committee in Gorkha District at about 3.45 pm, and on the Holeri Police Post in Southern Rolpa between 8-11 pm. The stated objective of this "protracted people's war" was to overthrow the bureaucratic-capitalist class and state system, uproot semi-feudalism and drive out imperialism in order to establish a new democratic republic^{14,15}.

The preventive and promotive health programs in Nepal were heavily depended on the donor's funds (80-85%) but in recent years some of the donor funded projects have been restricted by the rebels. The drug supply in the civil conflict areas was reported be affected^{16, 18, 22, 23}. The destruction of local governmental buildings such as Village Development Committees (VDC) offices also damaged those health facilities that were attached to the VDC and resource centers. Heads of the health facilities of many remote areas were moved to the District Headquarters. It was also reported that in conflict affected districts, the monthly target for outreach clinics was not met. Due to fear of arrests, hassles, interrogation and chance of being caught in the cross fire from both the rebels and the government security forces, the health workers reported reluctance to travel to conflict affected areas^{16, 17, 18, 22, 23}.

Civil conflict appears as an intense political contest, fueled by grievances, which are so severe as to have burst the banks of normal political channels¹⁹. Albeit medicines or services may be accessible but not necessarily utilized. Access refers to potentiality and utilization refers to freedom or ability to obtain or make use of services. Lee, considered that; physical availability, financial affordability, acceptability, and geographical accessibility are the key indicators of utilization of the health services^{20, 21}. In this study these four indicators, the burden shown by the prevalence of TB during the conflict and the indicators of conflict were used in analyzing the affects and association with utilization. For the purpose of this study, the indicators as defined by Collier were utilized¹⁹. These were: a) involvement of national Government b) curfews declared by Government, c) killings and casualties of civilians and armed forces which happened due to both armed forces, d) closures (Bandha) declared by Maoists and e) mass-campaigns organized by the Maoists.

The research questions were: Does the level of civil conflict, physical availability, financial affordability, acceptability, and geographical accessibility differ in the areas with and without civil conflict? Does each of

these factors have an association with utilization of TB services?

Methods

First, the annual prevalence of TB in last 5 years (1998 to 2003) was studied to explore the affects of civil conflict in the study areas. The prevalence of TB was done by reviewing the medical records from both primary and secondary level health facilities. Medical records from all Directly Observed Treatment Short Course (DOTS) Centers, Sub Centers, District Health Offices and NGOs of the study areas were reviewed in the present study. Secondly, a cross sectional study design with a quantitative method was used in this study. TB patients who were smear positive and were receiving their treatment from DOTS centers as well as sub-centers (21 days to 8 months of treatment) in the study areas, were the population for this study. The study areas, namely the districts of Dang located in the Mid-Western Development Region and of Lalitpur located in the Central Development Region and adjoining the capital city Kathmandu, were purposively selected. As the government declared Dang as a highly conflict affected area, Dang district was selected as the conflict area (CA). During the study period, Lalitpur was not recognized as a conflict affected district, thus it had been taken as an area without civil conflict (NCA) in this study.

The ethical approval was obtained from the ethical review board of Nepal Health Research Council. In both study areas, consents were obtained from the local administrations for the entire study and from the District Health Offices to identify TB patients who were smear positive and undergoing treatment through the DOTS centers. From the approved list in each study areas, 200 patients were randomly selected. Those selected were provided with informed consent forms with request letters signed by the Principal Investigator (PI). Study subjects responded promptly and properly; out of 200 requests sent, 182 (91%) in Lalitpur and 180 (90%) in Dang agreed to respond to the questionnaire. A questionnaire was provided to all subjects who had signed a consent form. Due to the 2 incomplete responses from Lalitpur, 180 from both study areas were included in the analysis. Questionnaires were pre-tested in Surkhet as a conflict area and Kathmandu as a non conflict area. Simple language modifications were done after the pre-testing. The questionnaire was comprised of the questions related to a) socio-demographic variables, b) Treatment category and process, c) physical availability, d) financial affordability, e) acceptability, f) geographical accessibility, and g) level of civil conflict. Questionnaires were implemented by the local health

worker who understand the local language and culture but not currently working in government health facilities.

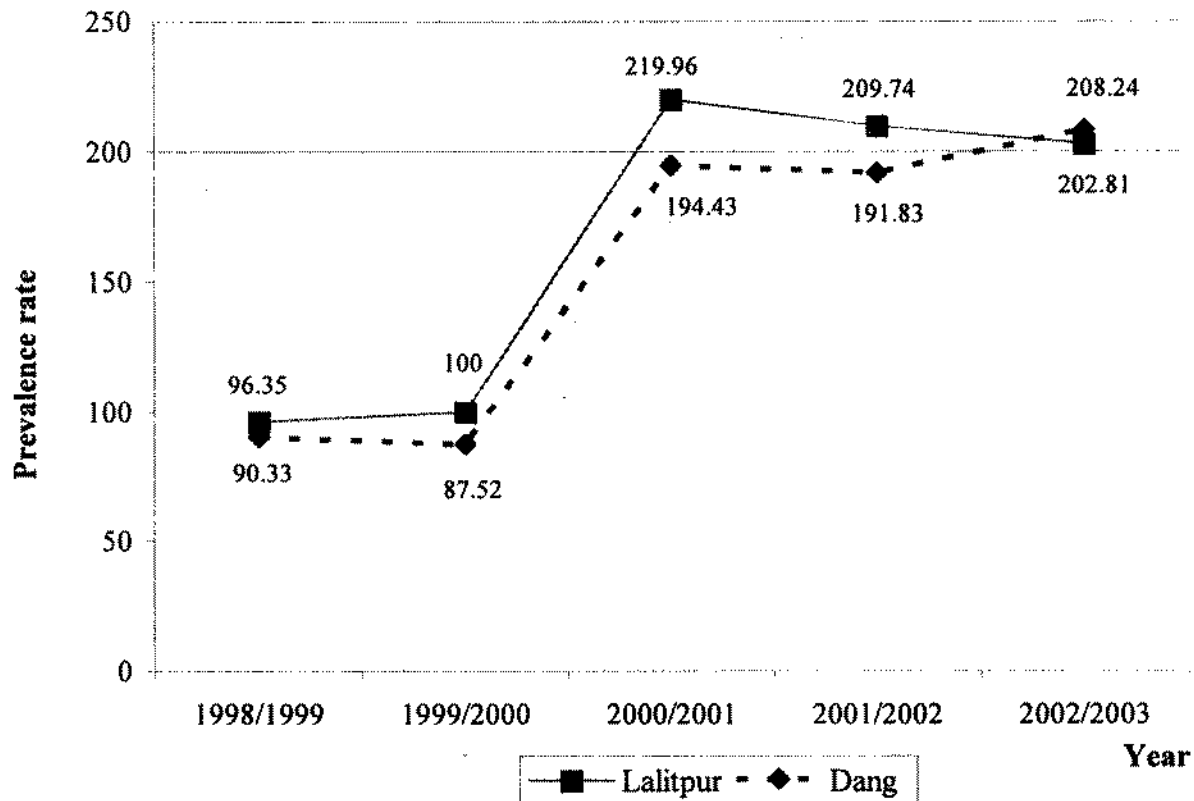
The obtained records were verified by presenting the annual prevalence at districts level. Analysis by using Chi-Square test and Logistic Regression (P-value <.05) was done to answer the research questions. Before using the SPSS software, data were verified by the enumerators from local level. After that all data were cleaned at national level and coded in Microsoft Excel Program. Then all the data were transformed to the SPSS and final analysis was done. Before launching logistic regression model, a stratified analysis by gender, age and occupation was done.

Results

Prevalence of TB

Records were reviewed from 1998/1999 to 2002/2003, and are shown in the figure 1. In the year 2002/2003, the prevalence rates in Dang and Lalitpur are 208.2 and 202.8 per 100,000 populations. The prevalence rates in CA were increasing while decreasing in Lalitpur from 2000/2001 to 2002/2003. A significant difference between NCA and CA found in the year 2000/2001 (95% CI, 0.000052, 0.00045). The general impression is, the total cases have been increasing in CA and in NCA the prevalence has been decreasing.

Figure 1: Prevalence of TB cases from 1998 to 2003



Evidence of civil conflict

All the indicators of civil conflict were used to identify an evidence of civil conflict in both study areas. As shown in Table 1, respondents mentioned that mass campaigns by Maoists were not organized in the NCA. However, in CA 44 percent mentioned that mass campaigns were organized. In addition, all of the participants from NCA mentioned that curfews were not declared by the Government. In contrast 78 percent

of the respondents from CA mentioned that the curfews were declared every day for the last 3 months. This table also shows that no killings happened in NCA. In contrast to that 81 percent of the respondents from CA mentioned that the killings had taken place in their house or communities. The table also demonstrates that one person (0.5%) reported that there were casualties happened in NCA. However, 78 percent of the

respondents in the CA reported that the casualties had happened in their communities. Albeit mass campaigns were not organized, curfews were not declared and killings were not happened, closures were experienced

by 72 percent of the respondents in NCA. In CA 92 percent of the respondents reported that the closures had been declared by Maoist during last 3 months. [Table 1]

Table-1: Evidence of civil conflict in NCA and CA

Evidence of civil conflict	NCA (180)				CA (180)			
	Yes		No		Yes		No	
	N	%	N	%	N	%	N	%
Mass campaign organized	0	0.0	180	100	79	44.0	101	56.0
Curfew declared	1	0.5	179	99.5	141	78.0	39	22.0
Killings happened	0	0.0	180	100	145	81.0	35	19.0
Casualties happened	1	0.5	179	95.5	140	78.0	40	22.0
Closure declared	129	72.0	51	28	166	92.0	14	8.0

If Evidence of Civil Conflict, Affect on Visit to Health Facilities

As shown in Table 2, in NCA mass campaigns, killings, and casualties had no affect on visits to health facilities. One person reported a problem during curfew. Albeit 129 respondents reported closures, only 123 reported an affect on visit, 24 percent of 123 respondents reported problems visiting health facilities. In contrast, the

respondents from CA reported that there were affects of each of the indicator on visit to health facilities: a) mass campaigns, 82 percent of 79 respondents, b) curfew, 52 percent of 141, c) killing, 85.5 percent of 145, d) casualties, 91 percent of 139 and e) closure, 74 percent of 166 could not go to the health facilities. [Table 2]

Table-2: Evidence of civil conflict, affect on visit to health facilities

Affect on visit	NCA				Total	CA				Total
	N	Yes %	N	No %		N	Yes %	N	No %	
Mass campaign organized	-	-	-	-	-	65	82.0	14	18.0	79
Curfew declared	1	100	-	-	1	74	52.0	67	48.0	141
Killings happened	-	-	-	-	-	124	85.5	21	14.5	145
Casualties happened	-	-	-	-	-	126	91.0	13	9.0	139
Closure declared	30	24.0	93	76.0	123	123	74.0	43	26.0	166

Differences between factors and daily drug use in NCA and CA

Nine factors defined as indicators of utilization (daily use of drug) were used while measuring differences between factors in both NCA and CA (Table 3). These

indicators were: Good knowledge about TB service, microscope health facility, separate examination room available, TB service unaffordable, stop work while

treatment, satisfaction to the service, female staff in health facility, dogmatic behavior of health worker, and health facility in walking distance.

Table- 3: Differences between factors and daily drug use in NCA and CA

Factors	NCA (180)			CA (180)		
	n	N	X ² (p-value)	n	N	X ² (p-value)
Good knowledge about TB service	Yes	164	54	129	60	0.429
	No	15	119	50	119	
Microscope in health facility	Yes	156	128	129	112	0.666
	No	15	43	51	68	
Separate examination room available	Yes	165	56	129	23	0.212
	No	15	124	51	157	
TB Service unaffordable	Yes	165	33	129	45	0.504
	No	15	147	51	135	
Stop work while treatment	Yes	163	59	129	109	0.292
	No	15	119	51	71	
Satisfaction to the service	Yes	165	143	129	160	0.054
	No	15	37	51	20	
Female staff in health facility	Yes	165	170	129	149	0.097
	No	15	10	51	31	
Dogmatic behavior of health worker	Yes	165	74	129	46	0.261
	No	15	106	51	134	
Health facility in walking distance	Yes	165	68	129	132	0.100
	No	15	112	51	48	

n= taking TB drug every day, N= Factors

The factors: Good knowledge about TB services, separate examination room available, TB service unaffordable, stop work while treatment, female staffs in health facilities and health facilities available in walking distance were found to be statistically associated (P-value .009, .012, 0.055, 0.004, .011, .016) with the utilization of TB services in NCA. However,

none of these factors were statistically associated with utilization in CA. This table also shows that, satisfaction of patients with provided services was statistically associated (P value 0.054) with utilization. The table demonstrates that this factor is not statistically associated with utilization in NCA.

Associations between Factors Related to Utilization and Utilization of TB Services

In order to establish the association between all factors and utilization, a logistic regression model was used in the study. Total samples (n=360) were used in statistical calculation. Utilization (daily use of drug) of TB services was calculated as a dependant variable. Logistic regression models, as presented in table 4, had 10 missing cases (3.6% of total cases). Following factors defined as an indicator of the utilization were

put in the logistic regression model: Good knowledge about service, knowledge about drug, microscope in health facility, separate examination room, female staffs in health facility, affordability causing problem, satisfaction to provided service, dogmatic behavior of health worker, health facility in walking distance, mass campaigns organized, curfew declared, killings happened, casualties happened and closure declared.

Table- 4: Associations between factors related to utilization and utilization of TB services

Factors	B	OR	95% CI for OR	P-value
Good knowledge about service	-.348	.706	.359, 1.388	.313
Knowledge about drug	-.191	.826	.422, 1.615	.576
Microscope in health facility	.208	1.231	.629, 2.410	.544
Separate examination room	.040	1.041	.466, 2.324	.922
Female staffs in health facility	.069	1.071	.387, 2.960	.895
Affordability	.315	1.370	.592, 3.171	.462
Satisfaction to provided service	-1.417	.243	.072, .816	.022
Dogmatic behavior of health worker	-.423	.655	.324, 1.325	.239
Health facility in walking distance	.826	2.285	1.179, 4.429	.014
Mass Campaigns organized	.043	1.044	.481, 2.265	.913
Curfew declared	-.105	.900	.419, 1.932	.787
Killings happened	-1.170	.310	.120, .804	.016
Casualties happened	-.308	.735	.307, 1.758	.489
Closure declared	.632	1.881	.845, 4.189	.122
Constant	2.552	12.833	-	.002

Firstly, we identified that the satisfaction to the provided services was associated (P-value .022) with utilization. The model shows that if satisfaction to the TB services increase by 1 unit the log of the odds of utilization will increase. The Odds Ratio (OR) for utilization in satisfaction to provided services was .243 (in comparison to 1 in the reference group). Secondly, study revealed that there is statistical association

(P-value .014) between health facilities in walking distance and utilization. The model shows that if HF in walking distance increases by 1 unit, the log of the odds of utilization will increase. The Odds Ratio (OR) for utilization in HF in walking distance was 2.285. Thirdly, association (P-value .016) was found between killings and utilization. The model found that if killings increase by 1 unit, the log of the odds of utilization will

be decreased. The Odds Ratio for utilization in killings is .310 (in comparison to 1 in the reference group). The model identified that the killings occurred in the family and community contributes to decrease daily use of drugs. The rest of factors were not been found to be statistically associated with utilization.

Discussion

A study indicated that in conflict areas, transportation of drugs involves delays and requires lengthy coordination with security forces. More importantly, in most of the areas porters take the drugs to the peripheral health facilities, where they were at risks of encountering Maoist with whom they must negotiate, porters were worried about receiving the payment (wages) if the drugs were confiscated by security forces or by the Maoists^{17,22}. The security forces have established check posts along the roads for all passing vehicles which often doubled the travel time by public transport to hospital. The time depends upon the number of passengers in a vehicle, their luggage and, number of vehicles in line for the check post. In highly conflict affected areas people were not allowed to get out of their waiting vehicles, so they could not easily request priority for emergency patients^{16,17,18,23}.

During the implementation of the present study the team had also been experienced several interrogations and hassles from the government security forces. The travel was extremely difficult when going in and coming out from the DOTS treatment centers and sub-centers located at Maoist dominant areas in Dang. The formality required for both forces was the key barrier for this study. However, approval from higher authorities and coordination with local people had been instrumental in completing the study.

A retrospective study conducted in Guinea-Bissau demonstrated that the mortality rates for patients undergoing treatment in the war and peace cohorts were 34 and 12 per 100 person-years, respectively corresponding to a 3-fold higher mortality in the war cohort, adjusted MR, 3.12 (95% CI: 1.20-8.12). The greater impact was among the patients in the intensive phase of treatment, for which the adjusted MR was 3.30 (95% CI: 1.04-10.50). Patients with the TB were forced to temporarily abandon treatment, which was associated with increased mortality⁷. An interventional study carried out in North East India, Churachandpur District reported that refugees and displaced people are at increased risk of developing active TB as consequences from nutritional deficiency, crowded living conditions, and lack of access to TB services. The study estimated that 50 percent refugees are infected with TB²⁴.

Present study identified that the prevalence of TB was increasing in CA. The most important reason observed during the study was the displacement of the TB patients from the Rolpa, Rukum, Puythan and Salyan districts. All those hilly districts are adjoined to Dang and also known as highly conflict affected districts. Absenteeism of health staffs, lack of local employment and conflict had forced TB patients to settle down to Dang where they can have relatively more health service and financial opportunities. The Prevalence in Lalitpur also found to be increasing up till 2001. The reason could be the internal displacement from highly conflict affected districts to Capital city. The successful implementation of Urban DOTS in Lalitpur can be viewed as one of the contributing factors for reducing annual prevalence in the district.

As shown by other studies, the killing happened in the family and community affect the utilization. The present study also identified that killing which happened in the patient's communities or in their families caused to reduce the utilization of TB services. The univariate analysis suggested that the mass campaigns, curfews, closures, casualties, and killings were forcing patients not to utilize the TB services in CA. This study identified that there are differences in the utilization of the TB services between conflict and non conflict areas. Interestingly, the health facility in walking distance in NCA found to be important, the reason could be the nature of the jobs in NCA.

Limitations and Conclusions

The limitation of this study must be noted. First, the current level of civil conflict has been affecting the entirety of Nepalese geography. Some indicators of the conflict used in this study i.e. closure (Bandha), curfew and mass campaigns can also be seen in Lalitpur district. However, the level of civil conflict between Lalitpur and Dang can not be compared. Second, this was a cross-sectional investigation, so that we could not identify causal relationship between variables. Third, the study was conducted in one district the findings from this study may not be generalizable to the whole country.

This study, however, represents an initial effort to present a picture of TB service utilization in with and without civil conflict areas. As such, it represents a pioneering epidemiological study, helpful in developing understanding on TB service delivery system in civil conflict area. The closure, curfew, casualties, and killings were affecting both health workers and patients to go to the health facilities. In order to ensure the access to TB treatment and completion of the eight

months long treatment in conflict affected areas a critical review on existing DOTS strategy need to be done. Due to the lack of functioning VDC, the existing modality of DOTS was not observed to be practical. The participation of people from different walks of life, locally accepted institutions and local informal groups should be encouraged while constituting the new DOTS modality. Training comprised of both technical and life skills during the war need to be provided to the local health workers. A study with larger samples, wider time span and a use of a multidisciplinary study team in the research are required to establish nationally acceptable references.

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