Socio-economic and operational consideration on tuberculosis control programme

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Tuberculosis is a major public health problem in Nepal. It has become a significant problem not only in developing countries, but also in developed countries countries. The causes behind this upsurse are multiple. Socio-economic development education, availability of the quality health services to the general mass are key factors in tuberculosis.

INTRODUCTION

Tuberculosis has become a grave concern in all parts of the world recently because of resurgence of tuberculosis. TB epidemic is out of control in most parts of the world. WHO, therefore, declared TB as global emergency in 1993. Reasons of this resurgence have been identified by WHO as mainly due to HIV pandemic, less health priority given to the disease and significant increase of multi-drug resistant tubercle bacilli as a result of inadequate treatment. If the neglected health priority in the economically developed nations was the main reason of this state of upsurge in the illness, in developing countries tuberculosis remains as one of the biggest health problems mainly because of poor results of the national tuberculosis programme which are definitely related to socio economic and operational factors also [1]. In this paper we shall try to focus on socio-economic and operational factors to the problems of tuberculosis in Nepal and on the cost effectiveness of interventions against this disease.

Problem of tuberculosis in Nepal.

Tuberculosis remain as a major public health problem in Nepal. The health information system of the country as usual in developing countries, is too incomplete to provide information on the incidence and morbidity of tuberculosis. Estimate of the burden of tuberculosis has been done on the basis of average annual risk of infection (ARI) which means the probability that an individual will be infected with *mycobacterium tuberculosis* in one year. It is derived from the tuberculin test results in non-vaccinated children. ARI is considered to be the best indicator for measuring the epidemiological situation of any country or community. Repeated tuberculosis surveys of a population a few years (say 5 or 10 years) apart may provide reliable information on the trend of tuberculosis in the country. Thanks to the pioneering work of Styblo and Sutherland for this sound basis of ARI to determine the epidemiological situation of tuberculosis even in absence of information on the incidence or morbidity records of tuberculosis.[1] On the basis of various tuberculin surveys carried out on different occasions at different places of the country, ARI of Nepal has been estimated to be in between 1-3%; the higher values being in urban and terai belts and lower values in mountain and hills.[2] One percent ARI corresponds to the incidence of 50 smear positive cases of pulmonary tuberculosis per

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100,000 population. Assuming ARI to be 2.2% for the whole country, the estimated incidence of new smear positive patients will be 22000 approximately in 2 million population of Nepal (all in box below). The prevalence of smear positive tuberculosis will be twice the incidence (Holm 1970).

Tuberculosis situation of Nepal on ARI basis

Total population	ARI	Smear (+) incidence	Estimated No. Smear (+)
2 million	2.2	110/100,000	22,000

Epidemiological situation of TB in Nepal as reported by the joint review team of HMG and the WHO 1994,[3] is described below (see box).

Epidemiological situation of Nepal

* Infection: 60% population aged 15 -49
* Incidence: 237/100,000 population (45% smear +)
* 47,000 new cases arise annually (50% detected)
* 75% of Cases are in young adults (15-44 yrs.)
* Low treatment completion rate (40%) leading to high number of chronic and drug resistant cases.
* 16500 people die of tuberculosis annually
* 15% of new cases in urban areas where 10% of population lives.

Source: HMG and WHO 1994.

Age & Sex distribution of tuberculosis

Although tuberculosis affects all age groups its impact is greatest on productive adults (Fig 1). The social and economic burden of this disease to the family, society and the whole nation is quite evident from this age distribution.
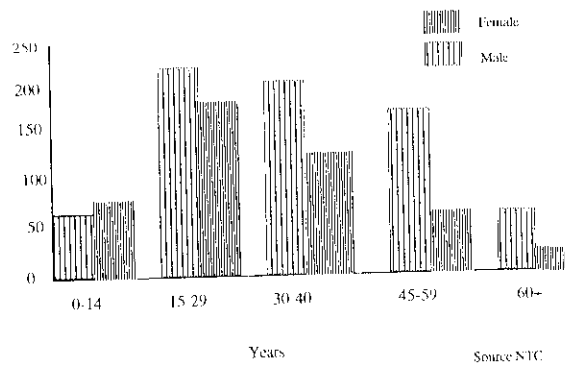

Fig. I Age and Sex distribution of TB patients in Nepal

Tuberculosis in Women

In industrialized countries, tuberculosis incidence and mortality rate were higher in young women 4 decades back Fig. 2. With the decline in the risk of infection in those countries, tuberculosis shifted from being a disease of young women to a disease of old men. If this is also the case in the epidemiology of tuberculosis in developing countries like Nepal there must definitely considerable variance in case detection rates for young women. The case detection rates among males is apparently higher than in females from Fig. 1. Could it be due to socio-economic and cultural factors ? The answer to this question can only be given by investigations in this direction.
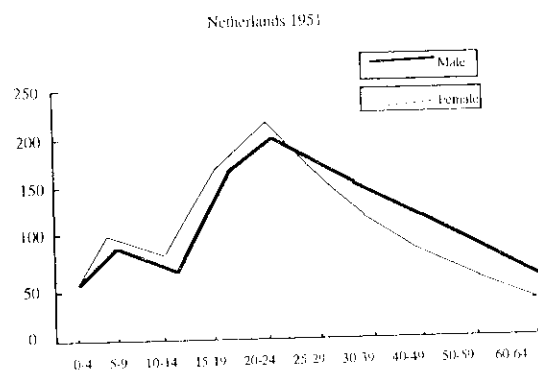

Fig. 2: Incidence of Pulmonary TB by age and sex - Netherlands 1951

Key activities of National Tuberculosis Control Programme (NTP)

i.   Case finding

ii.   Case-holding

iii.   Management and

iv.   Recording and reporting are the key activities of NTP.

A fair idea of each of these activities can be had from operational and sociological studies, and such studies are important to know where much more attentions need to focussed for the success of the programme.

Sociological Studies on Casefinding

Two sociological studies were carried out in 1984 and 1992 from the central chest clinic and the National Tuberculosis Centre of Nepal (Shakya T. M.), the main aims of which were to know the main presenting symptoms among direct sputum positive pulmonary tuberculosis and patients delay and doctors delay in the diagnosis of tuberculosis.[2]

Main presenting symptoms: 84-87% had cough associated with fever, chest pain and haemoptysis.

Delay in diagnosis: 43-60% were aware of symptoms for more than 4 months. In spite of that they did delay in taking actions due to ignorance, following own methods of treatment, inaccessibility of health facilities, confidence placed over the available facilities (table I)

Table I. Duration of awareness of symptoms among new sputum positive TB

1984 Study (N: 252)

Less than 2 wks		2-4 wks		5 wks 3 months		> 4 months	
No.	%	No.	%	No.	%	No.	%
-	-	29	11.5	73	29	150	59.3

1992 Study (N:103)

No.	%	No.	%	No.	%	No.	%
10	9.7	18	17.41	31	30.02	54	42.81

If facilities were available most of them could have been diagnosed and treated without any delay (Table II). Even in the central TB clinic there was delay in diagnosis in about 14% of cases. The reason was that some patients did not wait for getting investigated while others did not return to collect the reports of investigations (included in the delay).

Table II Time interval from 1st contact to diagnosis in TB clinic

No. interviewed		< 2 wks		2-4 wks		> 5 wks	
No	%	No	%	No	%	No	%
103	100	89	86.4	9	8.7	5	4.8

Source: NTC 1992.

Facilities used by patients before diagnosis

Different facilities used by patients before diagnosis were also tried to find out by interviewing Table III, 52 out of 103 patients interviewed in 1992 study replied that they consulted other sources before coming to the TB clinic (might be rather under reported [2]).

Table III: Health facilities made use by patients before diagnosis

Health Facilities	No. of Patients
Hospitals	15
Medical shops	10
Health posts	10
Private doctors	14
Traditional Medical Practitioners (TMP)	3

UNDP reports that majority of Government employees maximize their time to private practice.[4]

IDRC of Canada and Institute of Medicine Nepal undertook 4 different studies on rural health needs to explore the existing health needs, health utilization patterns, unmet demands, community satisfaction etc. They also found that quite a number of patients consulted TMPs. Positions of TMP's in fact are deep rooted in traditional society of Nepal. TMPs are consulted

in all health issues in rural areas.[5] They can be the best referral agents provided they are motivated and trained.

Another important issue - most of the TB patients are being diagnosed or treated by private doctors. Patients initially prefer private treatment as they perceive it as better. Later they may switch on to NTP regimen. Such mixing of different regimens may increase failure rates.[1]

TB control Programme should therefore involve private practitioners to ensure high cure rate by providing:

- orientation from time to time

- subsidies

- and simple forms to report on cases detected and treated.

At present, it is not known what percentage of tuberculosis are being detected and treated by private practitioners and what are the results of their treatment, as they are not reporting.

Eligible chest symptomatic and their sputum test done in health posts of 4 districts

Studies were conducted in health posts of 4 districts to find out the eligible chest symptomatic among the out patients attendants. 2-4 % were chest symptomatic (table IV). But the number of new sputum collected and examined were found to be less than actual number of new chest symptomatic eligible for sputum testing for diagnosis of tuberculosis (table V). Rate of sputum positive out of number of sputum examination were found to be 5-10 %, which was reasonable from the basis of operational norms.[2]

Table IV: Chest symptomatic among outpatients attending the health posts

Districts	Out patients attendance	Chest symptomatic	
		No.	%
Dhading (5 HPs)	39,183	1442	3.7
Chitawan(4 HPs)	30,558	52.1	1.9
Kaski (4HPs)	56,008	1102	2.0
Kathmandu(4HPs)	13,159	245	1.8

Table V - New sputum positive rate out of new sputum examined

Districts	No. of new sputum exam	Sputum positive	
		No.	%
Dhading	538 out of 1442	26	4.9
Chitawan	384 out of 521	40	10.2
Kaski	289 out of 1102	22	7.6
Kathmandu	190 out of 245	12	6.3

Case Holding:

The chief aim of TB control programme is not only to treat patients but also to hold cases until cured. Wide varieties of effective regimens are available now whose effectiveness have been well proved by many clinical trials. Potential efficacy of these drug regimens when followed regularly, are virtually 100 %. Choice of regimens is influenced by success rate aimed and cost is another important issue to be taken into account. There are 2 indices for the evaluation of the regimen in clinical practice:

- Sputum conversion rate at 2 months after the start of treatment

- Proportion of patients who have bacteriological relapse (table 8)

In short course chemotherapy, if it is regularly taken, conversion rate at 2 months is more than 80 % wher eas in so called standard 12 months chemotherapy it is less than 50 %.

Table VI: Various drug regimens:- Standard 12 months and short courses

Duration (months)	Regimen	Failure & Relapse
12	2STH+10HT	5- 10%
8	2SRHZ/6HT	0 - 3 %
8	2ERHZ/6HE	0 - 3 %
6	2SRHZ/4RH	0 - 2 %
6	2ERHZ/4RH	0 - 2 %
6	2RHZ14RH	1 - 5 %

S	->	Streptomycin
T	->	Thiacetazone
H	->	Isoniazid
R	->	Rifampicin
Z	->	Pyrizinamide
E	->	Ethambutol

Certainly even the most effective regimens fail if not taken adequately or if it is irregularly taken. Main cause of the problem in the treatment of tuberculosis is inadequate treatment due to non-adherence (non-compliance) to treatment. Poor case holding instead of reducing problem, creates another serious problem of multi-drug resistance.

Multi Drug Resistance (MDR):

The WHO review team (1994) reported that among patients with no previous treatment, 5-24 % had strains resistant to one or more drugs (primary resistance). Among patients with previous history of treatment at least 50% had resistant strains to 1 or more drugs. 65-70% of retreatment cases are resistant to refampicin and at least one other drug. Evidence from patients in controlled clinical trials has shown that initial resistance to refampicin plus isoniazid is a major threat to the success of short course chemotherapy. Globally MDR has become a grave concern and has been taken as one of the reasons of resurgence of tuberculosis. The only way to stop MDRT is appropriate and adequate treatment by all means. The new global strategy has been to cure 85 % of new smear positive cases of course by using short course chemotherapy and detect 70 % of existing cases.[5] The direct benefits of chemotherapy for sputum positive pulmonary tuberculosis can be estimated in terms of cured, death averted and potential lives of years saved. The indirect benefits are counted in terms of reduction in transmission.[1]

Table VII: Assessment of new smear positive treated with 2RHZE + 6HT in 2 districts (1990 - 1991)*

•	No assessed	-	429 (100%)
•	Cured (Sputum -ve)	-	262 (61.1%)
•	Complete treatment	-	86 (15.9%)
•	Lost	-	65 (15.2%)
•	Failure	-	10 (2.3%)
•	Died	-	14 (3.3%)
•	Transferred out	-	10 (2.3%)
•	Cured + Complete	-	78%

* Source: NTC

In these 2 districts, there were regular supervisions from the centre and constant supply of drugs which are in fact the prerequisites for the effectiveness of NTP.

Table VIII: Assessment of TB patients registered from 1988 - 1989 in one district Regimen 2SHT + 10 HT*

•	No assessed	-	161 (100%)
•	Treatment Completed	-	53 (32.9%)
•	Lost	-	101 (60.9%)
•	Failure	-	5 (3.1%)
•	Died	-	14 (3.3%)
•	Transferred out	-	2 (1.2%)

* Source: NTC

Advantages of Short Course Chemotherapy

More rapid cure and more rapid sputum conversion, thereby reducing the chances of transmission, are obvious advantages. Relapse and failure rates are rare thereby the retreatment costs (quite expensive) became lower. But care should be taken that treatment should be taken adequately by patients and should be closely monitored, failing which relapse and failure rates would be increased adding more cost of retreatment to the cost of NTP. Drugs for the SCC cost about 30 to 80 dollars per patients depending upon the choice of the regimen whereas for the so called standard course cost only 10 to 15 dollars. But the cost of death averted is higher in the later course which is obvious from the facts that not more than 30 % of patients complete treatment as against more than 60 % for the SCC.[7] If the cost has to be borne by patients almost of whom are poor, it will be too high for them. Therefore, treatment should be free of cost and readily available to them.

Managerial aspects of NTP

With the simplification and standardization of control measures, TB control techniques can be applied under any conditions. But the measures have not been so successfully applied

resulting in unsatisfactory results in the achievement. In this respect, the four principal managerial activities of NTP i.e. planning, implementation supervision and evaluation aspects have no be taken into full account and reviewed. The need of integration of tuberculosis control activities into primary health care (PHC) or general health services is out of question. The state of those PHC has therefore much to do with the success of NTP. Hence, every effort should be made for effective discharge of responsibilities of the staff working in the general health services.

Recording and Reporting

They are often incomplete and do not provide essential information at present. The report which are based on records, assist in programme monitoring, supervision and evaluation to which are essential for service and programme management as well. As the records have to be kept by general health workers who have many other activities to be carried out, they should be as simple as possible and limited to essential only.

CONCLUSION

Tuberculosis remains as a major public health problem in Nepal. Consequences of TB have much to do with the socio-economic development of the country, education of the general mass, availability, accessibility and quality of health services. The case finding method most suited to the rural settings being sputum microscopy of all the chest symptomatics attending the general health institutions, facilities of sputum microscopy should be available in them. At the same time staff should be trained and motivated for improving the case-detection rate. Case

detection and treatment must go together. The primary aim of treatment should be to cure every case diagnosed with adequate chemotherapy thereby reducing the chances of transmission as well as development of multi drug resistant strains. Several effective short course chemotherapy regimens are available now, the choice of which depends upon the resources available. There are much cost benefit of SCC in the treatment of tuberculosis if properly administered. A good deal of people prefer private treatment as they perceive it better and many cases are being detected and treated by them also. Similarly in rural areas, majority of people consult T.M.Ps. in all health issues. Hence, actions for involvement of private practitioners and T.M.Ps. in the programme have to be taken. As tuberculosis services are integrated into general health services, success of tuberculosis control programme depends much upon the development of general health services infrastructures.

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