



Original Article

Tuberculosis Situation in Bogra District After One Decade National TB Control Programme

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Abstract

The ongoing national TB control programme (NTP) of Bangladesh had started from 1993 and had expanded at all upazilas in collaboration with partner NGOs by June 1998. The NTP is following DOTS strategy with target 70% case detection and 85% cure rate. By this time more than a decade has passed but total achievement of NTP is yet remain mask due to absence of exact statistic on tuberculosis situation in our country.

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Objective: The main objective was to estimate tuberculosis situation in Bogra district.

Methodology

Study design - Descriptive and Cross sectional study.

Study period - 1st June 2004 to 30th July 2005. First phase of the study was conducted during 1st June to 10th July 2004 and Second phase was conducted during 15th June to 30th July 2005.

Study area - Ten upazilas (sub district) of Bogra district.

Study population- All population of ten selected upazilas of the district and it includes 2481793.

Selection of sample & sampling procedure – It was a stratified systematic random sampling procedure. Ten upazilas were divided into two groups (strata) depend on average TB notification

rate for last three years viz. group A- higher TB notification rate & group B lower TB notification rate. 10 words (smallest unit of upazila) from each group were selected by systematic random sampling method. Total 20 words (population 50458) were selected out of 891 words (population 2486732).

Patients diagnosis procedure - Preliminary TB suspects were identified by Shastha Shabika (SS), voluntary BRAC (NGO) health worker, working in 250 to 300 families which were reviewed by two supervisors of SS viz. Shastha Kormi (SK) & Program Organizer (PO). The supervisors during their visit issued a patient information form after duly complete with date to attained diagnostic camp in their word. Final TB suspects were identified by chest specialist (CP) at the camp. After clinical history & physical examination and three samples sputum were collected for

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examination. Some smear negative cases further two sets of sputum were examined and chest X ray were done. Number of TB patients receiving anti TB treatment during field work were also noted. After one year, during second phase similar procedure were followed to find out new smear positive TB patients in the study area. Total NSP TB patients diagnosed passively during one year period in the selected word were also noted.

Results

Field workers identified 406 pulmonary TB suspects out of 10907 household (pop.50454). At diagnostic camps CP examined them and identified 112 TB suspects. 10 smear positive were diagnosed by smear microscopy, 5 smear negative pulmonary TB (PTB) were diagnosed by X ray chest and 23 PTB (21 NSP + 2 SN) were under treatment during survey. Prevalence rate of PTB (all form) was $75/10^5$ and pulmonary new smear positive TB was $61/10^5$. Male to female ratio of PTB was 2.16:1 and mean age of male & female were 42 ± 12 & 37 ± 17 years respectively. During second phase prevalence of NSP TB found $65/10^5$ and incidence NSP TB patients was found $88/10^5$. Gender ratio of NSP TB patients was 2.07:1. Mean age of male NSP TB patients was 49 ± 15 and female NSP TB patients was 40 ± 14 years

Rational of The Study

The ongoing national TB control programme (NTP) of Bangladesh had started since 1993 and had expanded at all upazilas in collaboration with partner NGOs by June 1998¹. The NTP has achieved 99% of the geographical area DOTS coverage by the year 2003². It has target to detect 70% of new smear positive patients and cure at least 85% of them¹. By this time more than ten years has passed but achievement of NTP is yet remain mask According to first TB survey in this country (East Pakistan) in 1964 – 1966, the prevalence rate of smear positive pulmonary TB was 0.5%. At that time no effective anti TB treatment was available. After introduction of effective anti TB treatment after 70th decade, prevalence of TB did not change. Which was reflected in piecemeal TB survey in 1988 where prevalence rate was more or less similar. Present

NTP following DOTS strategy and has passed nearly ten years. So this can be hypothesized that prevalence rate of TB should change in this country. But how much TB prevalence has reduced remain unknown. According to latest national statistic by the year 2004 country has reached case detection rate 46%³. This estimation is based on Karin's statistics⁴ on tuberculosis situation in our cuntry. In 1996, Weyer Karin, an USA statistician, had estimated a statistics on TB situation of Bangladesh⁴. Her statistics was based on previous statistics on TB, reports of ongoing NTP and some statistical calculation. According to her statistics, in 1996, incidence of new smear positive (NSP) was $111/10^5$ and all form of TB incidence was $242/10^5$. Keeping this statistic as base line, NTP used to calculate incidence of NSP TB by reducing $1/10^5$ in each year or two from previous year incidence. This process of calculation of statistic is not scientifically sound. WHO also used to estimate TB situation of different countries of the world including Bangladesh. Their calculations are usually based on case notification to WHO, case detection rate, average duration of illness, ARI derived from tuberculin survey⁵. However in many countries, TB treatment is unregulated and data collected by the national health authority and reported in turn to WHO will be incomplete and perhaps inaccurate⁶. Estimation of TB situation following this strategy would very unlikely reflect the exact situation of the country. Prevalence rate from representative samples of the general population has been determined in some countries indicating the number of cases of active tuberculosis within the community at a given point of time⁶.

For a good programme and formulation of effective strategy for the NTP, estimation of exact TB problem of the country is needed.

In Bogra district the DOTS expansion programme of NTP had completed by mid of 1998 under GOB-BRAC (NGO) collaboration. From the beginning, NTP is running in the district effectively which is reflected in reports and statistics viz. case findings report, treatment out come reports, case notification rate and case detection rate (Based on NTP estimated incidence

rate). The district has overcome both the targets of NTP i.e., 70% case detection rate and 85% cure rate for last 3 years. However, present situation of TB in respect to incidence and prevalence in the district is yet uncovered. For further evaluation of the programme and strategy of NTP in the district, present situation of TB in the district is needed. Main objective of the present study was to estimate TB situation in Bogra district.

Specific objectives of the present study were –

- To determine prevalence of New Smear Positive (NSP) TB patients and all form of pulmonary TB patients in the district
- To find out incidence of New Smear Positive TB patients
- To assess male and female distribution pulmonary TB patients
- To determine age distribution of New Smear Positive patients

Methodology

Study design - Descriptive and Cross sectional study.

Study period - 1st June 2004 to 30th July 2005. First phase of the field work was conducted during 1st June to 10th July 2004 and second phase of the field work was conducted from 15th June to 30th July 2005.

Study area - Ten upazilas of Bogra district

Study population- All population of ten selected upazilas of the district and it included 2481793.

Selection of Sample & Sampling procedure – It was a stratified systematic random sampling procedure. At present the district consist of 12 upazillas. The old sador upazila is recently divided into two upazilas and it also includes Bogra town (Municipality). Due to some technical problem these two upazilas were not included in this study. At first selected ten upazilas were divided into two groups (strata) depend on average TB notification rate for last three years viz. group A – higher TB notification rate and group B – lower TB notification rate. Smallest unit of upazila is called ward and selected 10 upazilas had 891 wards.

Total 20 wards were selected; 10 from each group by systematic random sampling method. Selected 20 wards had 10907 household and total population was 50458.

Patients diagnosis procedure – Preliminary TB suspects were identified by Shastha Shabika (SS), voluntary health worker (BRAC), working within 250 to 300 household (family). Field works of SS are supervised by two supervisors (BRAC) viz. Shastha Kormi (SK) and Programme organizer (PO). Supervisors during their visit to the home of TB suspects identified by SS, verified the identified suspects. They then issued a form (Annex-I), after duly complete and fixed a date to attained diagnostic camp in their ward. They were also supplied two sputum containers for collection of sputum for examination at the camp. Though these field staffs are accustomed to do this work however, one day orientation training programme about details of this survey was imparted to them before fieldwork was started. It can be mentioned here that every household of the selected wards were surveyed with a specified format (Annex II) for preliminary suspect identification. At the camp, Chest specialist (CP) examined all these suspects clinically and three samples of sputum were collected (one over night, one morning & one spot) and slides were prepared at the camp. Subsequently these slides were examined at upazila microscopic laboratories. Some smear negative cases further two sets of sputum were examined after seven days. Those suspects identified by CP and were smear negative after three sets of sputum examination, were further examined by chest x-ray.

Number of pulmonary TB (PTB) patients receiving anti TB treatment either from NTP or under general practitioners (Registered), were also noted during fieldwork of the selected wards.

During second phase after one year, all the field stuffs were again given one day orientation about field works. Previous selected wards were resurveyed in similar way. Number of TB suspects identified, were given sputum cup for collection of overnight and morning sample and were advised to attain the diagnostic camp in the same spot in he

word in previously fixed date. These TB suspects were again examined by CP and three samples of sputum were collected for smear microscopy.

During one year period between first and second survey the selected words were passively followed for NSP TB diagnosed.

Results

All form of TB notification rate for last three years of ten selected upazilas are shown in table I and Figure 1.

Table – I: Shows TB (all form) notification rate (per 10⁵) of different upazilas for last three years

Upazilas	Year 2001	Year 2002	Year 2003	Average
kahalu	53.43	81.49	47.91	60.94
Dupchachia	48.51	66.93	84.12	66.52
Adamdighi	35.95	49.70	50.94	45.53
Nandigram	51.38	56.32	66.81	58.17
Sherpur	87.95	88.14	102.47	92.85
Dhunot	56.66	83.61	79.42	73.23
Gabtoli	86.46	77.29	70.61	78.12
Shariakandi	69.23	78.91	73.94	74.03
Sonatola	66.78	65.81	76.25	69.61
Shibgonj	37.34	29.65	51.62	39.54
Total	59.37	67.78	70.40	65.85

Figure -1: Shows TB notification rate in different upazilas

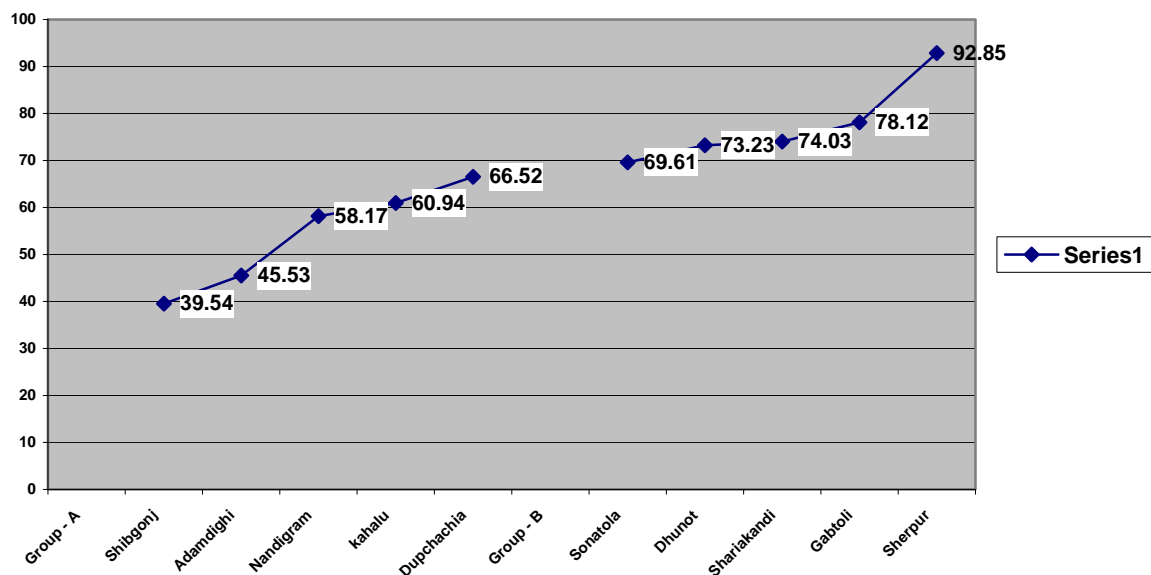


Table II shows selected wards, total household, total population and TB suspects identified by field workers.

Table – II: Shows selected wards, total household, total population and TB suspects identified by field workers

Selected wards	Total house-hold	Population			total	TB suspect identified by field workers
		male	female	child-dren.		
Powrashava W-5 (Kahaloo)	184	295	291	182	768	10
Sador union W- 3 (Kahaloo)	689	1023	992	646	2661	26
Kalai union W-1 (Kahaloo)	432	571	571	387	1529	18
Gunaher union W-1 (Dupchachia)	416	1168	1129	764	3061	19
Powrashava W-1 (Adamdighi)	733	1314	1312	1052	3678	34
Nasratpur W-9 (Adamdighi)	882	1773	1726	1068	4567	23
T. Mazgram union W-7 (Nandigram)	853	1430	1436	1048	3914	19
Bisalpur union W-4 (Sherpur)	470	812	798	549	2159	09
Kusumbi union W-1 (Sherpur)	467	940	923	594	2457	23
Nimgachi union W-4 (Dhunot)	851	381	380	347	1108	00
Sador union W- (Dhunot)	239	1246	1238	1168	3652	13
Nepaltoli union W-4 (Gabtoli)	1107	1334	1307	861	3502	38
Dhokhin para unionW-1 (Gabtoli)	653	1180	1060	823	3063	27
Narchi union W-4 (Shariakandi)	230	579	557	428	1564	32
Chandonbaisha W-8 (Shariakandi)	156	467	440	309	1216	19
Pakkullah unionW-1 (Sonatola)	573	1203	1124	332	2659	20
Sador union W-7 (Sonatola)	333	658	634	126	1418	13
Pirob union W-4 (Shibgonj)	710	970	943	706	2619	20
Sador union W-6 (Shibgonj)	384	601	586	383	1570	13
Rainogar union W-8 (Shibgonj)	545	1229	1222	842	3293	30
Total Wards =20	10907	19174	18669	12615	50458	406

Table III shows suspects identified by CP, pulmonary TB (PTB) diagnosed by sputum examination and PTB diagnosed by chest x-ray in selected wards during first phase.

Table – III: Shows suspects identified by CP and PTB diagnosed by sputum microscopy& by chest X-ray

Total suspects identified by field workers	Suspects identified by CP among suspects identified by field workers	PTB diagnosed by sputum microscopy	Sputum positivity rate (based on suspects identified by CP)	PTB diagnosed by X- ray	Total PTB diagnosed
406	112(27.58%)	10	8.9%	5	15

Prevalence of pulmonary TB is shown in table IV.

Table – IV: Shows PTB diagnosed, PTB under treatment, total PTB patients residing in survey area and prevalence rate.

PTB diagnosed by smear microscopy	PTB diagnosed by X-ray	Total PTB diagnosed	PTB (nsp+sn) patients under treatment	Total PTB (nsp+sn) patients residing	Total population of the study area	PTB (all form) prevalence rate	Prevalence of NSP TB patients
10	5	15	23 (21+2)	38 (31+7)	50458	75/10 ⁵	61/10 ⁵

NSP – New Smear Positive TB patients; SN – Smear Negative Pulmonary TB patients

The prevalence rate of PTB (all form) and NSP TB patients in the study area were found 75/10⁵ and 61/10⁵ respectively.

Table V shows proportion of PTB among male female and children (age ≤ 14 yrs) and male to female ratio.

Table V: Shows proportion of PTB among male, female and children (age≤ 14 yrs) and male to female ratio

Population surveyed	PTB residing	Proportion of PTB among male, female & children	Male to Female ratio among PTB
Male	19174	0.14	2.16:1
Female	18669	0.06	
Children	12615	0.00	
Total	50458	0.07	

There found no PTB among children (≤14 years) during survey in the study area. Male to female ratio among the PTB (all form) was found 2.16:1. Mean age of male PTB was 42±12 years and female was 37±17 years.

During second phase after one year the house hold and population in the selected wards were again surveyed and shown in table VI.

Table – VI: Shows household and population in the selected words during both phases

Survey period	Number of household	Population			
		Male	Female	Children	Total
First phase (June – July /04)	10907	19174	18669	12615	50458
Second phase (June – Jule/05)	10991	19749	19290	13285	52324

Table VII shows total pulmonary TB suspect identified, new smear positive (NSP) TB diagnosed, NSP TB under treatment during survey and prevalence of NSP TB patients during second survey.

Table – VII: Shows TB suspect identified, NSP TB patients diagnosed, NSP TB patients under treatment during second survey and NSP TB prevalence (point prevalence)

Suspects identified			NSP TB diagnosed			NSP TB under treatment			Total NSPTB patients reside during survey			NSP TB prevalence
Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	
213	118	331	4	2	6	21	7	28	25	9	34	65/10 ⁵

Male to Female ratio among the NSP TB patients was 2.8:1.

Table VIII shows total NSP TB patients diagnosed during second survey, total NSP TB patients diagnosed during one year period and incidence of NSP TB patients

Table – VIII: Shows NSP TB patients diagnosed during second survey, total NSP TB patients diagnosed during one year period and incidence of NSP TB patients

NSP TB patients diagnosed during second survey			NSP TB patients diagnosed during one year period study period (passive)			Total NSP TB patients diagnosed during one year study period			Incidence of NSP TB patients during study period	Male to Female ratio of NSP TB patients
Male	Female	Total	Male	Female	Total	Male	Female	Total		
4	2	6	27	13	40	31	15	46	88/10 ⁵	2.07:1

Age distribution of NSP TB patients is shown in table IX.

Table – IX: Table shows age distribution of NSP TB patients

Age group	0 - 14		15 - 24		25 - 34		35 - 44		45 - 54		55 - 64		65 or more		Total	
Gender	male	female	male	female	male	female	male	female	male	female	male	female	male	female	male	female
Number	0	0	2	2	4	4	5	4	8	1	5	3	7	1	31	15

Mean age of male NSP TB patients was 49±15 years and female NSP TB patients was 40±14 years.

Discussion

The present survey was done among the population of the district where NTP has been running effectively following national guidelines since 1995 (expansion of NTP had completed by 1998). This is reflected from case notification rate, case detection rate and cure rate of the district. So, finding of this study is very likely not representative of whole country. Among the surveyed population male to female proportion was more or less similar i.e., 38% vs. 37%. Children population (<14 years) was more than 25%. However, no PTB was found among the children during survey. It does not indicate that PTB does not occur among the children. It might

be very less proportion of PTB occurs among the children. In one previous study⁹ in this district from four years (1998 – 2001) registered TB patients, smear positive PTB in this age group was found 1.43%. Extrapulmonary TB (EPTB) is more common among this group. EPTB was not included in this survey due to diagnostic problem in the field level. Male to female ratio among PTB patients was 2.16 : 1 where as the ratio of male to female among the population was 1.53 : 1.5. It indicates that male PTB patients was more than twice than female. More male TB was also found other study^{7,8,9}.

According to the present study the prevalence of PTB patients (all form) in the district was found 75/10⁵ and NSP was found 61/10⁵.

During second survey male to female ratio among population in the survey area was found 1.02:1 which is similar to first survey in the selected area. During second phase of the present study, the prevalence of NSP TB patients was found 65/10⁵ which is slightly higher than first survey. The incidence of NSP TB patients was found 82/10⁵. According to NTP head quarter¹⁰ incidence of new smear positive TB patient in the year 2004 was 99/10⁵. This finding is very likely for this district as effective NTP running in this district for last 10 years. Male to female ratio among the NSP TB patients was found 2.3:1 which is more or less similar to national statistic¹ which is 5:2. Another interesting finding in the present study was that more NSP TB patients were in higher age group, reflected from mean age of NSP TB patients which was 50±14 years for male and 39±13 years for female.

Conclusion

The present study does not represent the TB situation of the whole country. Findings of the present study gives idea about TB situation in this district. It also reflects the impact of ongoing NTP in TB control programme. Experience of the present study brings confidence that it is not impossible to conduct this type of study throughout the country.

Acknowledgement

We must express our gratitude to BRAC authority who gave us permission to do this survey using their infra structures and man power. We should express our gratitude to 21 programme organizers, 14 Shastha Kormi, 14 Sanitary Volunteers at union level, 39 Shastha shabeka, who worked in the field without any personal interest.

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Annex -I

Estimation of Tuberculosis Situation In Bogra

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†ivMxi bvg ----- eqm ----- c~i“l/gwnjv/wkī (=/< 12 ermi)

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2	Ai“wP	Av†Q / †bB	
3	“^v“” bÓ nlqv	Av†Q / †bB	
4	Kvwk	Av†Q / †bB	
gš—e“	cix†vi cÖ†qvRb Av†Q		

L)cix†vi cÖ†qvRb †bB (wUK wPý w`b)

1] mw`©, nuvwP, Kvwk

2] k'vm Kó ev Uvb

3] mæcÖwZ †Kvb †iwR t Wv³vi cix†v K†i wUwe †ivM ai†Z cv†ibwb

4] A†bK w`b a†i gv†S gv†S K†d i³ Av†m

5] wUwe †iv†Mi J&la Lv†”Q

“^v“” Kg©xi bvg ----- ZvwiL -----

M] Wv³vi c~i“b Ki†eb

1) **cix†vi cÖ†qvRb Av†Q / cix†vi cÖ†qvRb †bB**

2) **kvixwiK cix†v - gš—e“ - m†`n RbK / m†`n †bB**

3) **Kd cix†vi wi†c©vU - aŸYvZæK / FbvZæK**

4) **ey†Ki G-†i cix†v - aŸYvZæK / FbvZæK**

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Annex - II

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