NTI NEWSLETTER(1991) 27/3 & 4, 62

DISTRICT TUBERCULOSIS PROGRAMME - KEY ISSUES IN MANAGEMENT +

K Chaudhuri*

The District Tuberculosis Programme(DTP) is designed to diagnose the maximum number of tuberculosis patients reporting to the health services and treat them effectively with the ultimate objective of bringing about a reduction in transmission of tuberculous infection. Since the tuberculosis cases are equally prevalent in the urban and rural areas and 80% of the population is in the latter, 80% of our tuberculosis burden is also estimated to be among them. It is, therefore, considered necessary to create a suitable infrastructure in the form of DTP to diagnose the patients reporting at the health facilities, wherever they exist, in order to reach the patients distributed in nearly 600,000 villages in the country. It is only through a high coverage of patients through general health services, that it appears feasible to achieve the above objective of the programme.

A National Monitoring Cell was created at the National Tuberculosis Institute(NTI), Bangalore, in recent times, to monitor the efficiency with which the DTP is operating towards achieving its objectives. The main activity which is being monitored is, of course, the efficiency of the programme in terms of distribution of the facilities (coverage of services) and efficiency of diagnosis at the available centres; and to a lesser extent treatment compliance. No doubt it is difficult to study the issue indepth from reported data originating from the routine service agencies. It nevertheless appears possible to hypothesise that the diagnostic activity under DTP takes place only at centres where the drugs are available and further that only such are the centres who report their activities. Hence the efficiency of case-finding could, in a way, be seen o be synonymous with the total efficiency of the DTP reflecting that of treatment delivery as well. It is generally believed that case-finding activity is more amenable to improvement, since it is the health service which happens to be responsible for the diagnostic activities. On the other hand, the efficiency of treatment services reflects more or less a fixed kind of patient behaviour provided, of course, drugs are available at the centres concerned. It is believed that whereas better management actions to tone up the system could and should result in higher efficiency of case-finding, far difficult to render and less well defined socio-economic inputs are called for in order to organise changes in patient behaviour pattern. Consequently monitoring seeks to study the case-finding efficiency more vividly to enable identification of corrective actions.

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The monitoring data is reviewed every quarter at the NTI, Bangalore, and the reports are transmitted to the districts concerned through the central/state governments. A review of the programme in different states gives us occasion for serious thought. Based on these, actions to remove the deficiencies could be initiated by the programme authorities at the national level as well as at the state level concerned. In this connection, it is noteworthy that the NTI had been discussing the performance of different states with the state level authorities at the seminars conducted at NTI, Bangalore, every year for quite sometime. Of late, however, the NTI has been visiting some of the states and discussing the findings with the state as well as district level health & tuberculosis programme administrators, in an effort to inform them regarding the continual use of the data available to them on performance of the programme. They are sensitised on some operational aspects of the DTP, e.g., how to organise and process the data already being produced by the health services under them in a routine manner and how to derive action oriented conclusions from these in an attempt to improve the programme efficiency. It is an effort to make it possible for them to process and use their own data-source themselves, instead of waiting for the NTI to transmit to them the results of the analysed reports and expect them to act on them. Discussed below are some of the aspects of the programme implementation and possible corrections, as available from the periodic reports, being compiled at the NTI in an ongoing manner.

Table 1 shows the Indian population(estimated for 1990) with 438 districts and the available health facilities in them. The average district population is shown to be around 1.88 millions. Of the available districts, 378 have been covered under the DTP(85%). At the expectation of one Primary Health Centre(PHC), supposed to be available for 30,000 population, there could be 27,400 Peripheral Health Institutions(PHIs) in the country. It is understood that only 21,230 PHIs are in position in India, with 15,270 implemented under the DTP(56%). Of the DTPs functioning, 38% are covered under the Short Course Chemotherapy(SCC). In the remaining, Standard Regimen(SR) is available for treatment of tuberculosis.

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Table 2 shows that a DTP is calculated to have a potential for diagnosis of 2,500 smear positive cases in an average Indian district having 1.8 million population, today. These potentials are, however, calculated on the basis of earlier NTI studies, wherein: prevalence rate of culture positive cases was 4/1000; 50% of the prevalent cases were supposed to be reporting to about 50 PHIs in a district of about 1.5 million population; 80% of these self-reporting patients were smear positive; on an average 2.5% of the new out-patient attendance had cough of more than two weeks duration and 10% of them were expected to be sputum positive. These potentials were worked out on the basis of highly motivated research workers of the Institute working under rigorous research discipline. However, it has been NTI's experience

Table 1

POPULATION AND INFRASTRUCTURE (INDIA-1990)

1.	Mid year estimated population (1990)	:	822 m
	No. of districts	:	438
	No. of DTPs	:	378
	Implemented	:	85%
	Average district population	:	1.88 m
2.	Health Institutions expected:		
	@ 1/30,000 population	:	27,400
	Health Institutions available	:	21,230
	PHIs implemented	:	15,270
	Percent	:	56%
3.	Short Course Chemotherapy:		
	DTPs functioning	:	378
	Covered under SCC	:	252
	Percent	:	67%
	Percent of PHIs covered under SCC	:	38%

that no DTP in any state has ever been able to approach anywhere near this potential. Therefore, it is considered that it could be a stiff, nay even unreal, estimate of the potential for the District Tuberculosis Centres(DTCs) to achieve! It could, on the other hand, be more practicable to consider the best performance figures achieved by any DTP anywhere in India to be the "**expectation**" for other performing DTPs! The performance of the DTPs are therefore matched against this expectation. Those who would realise these expectations would then be offered the challenge of achieving the "**potential**" as per NTI operational studies. In table 2, the "**expectation**" of an average DTP in India is shown to be 1,620: 1,120 for the PHI and 500 for the DTC. It can be observed that achievements of an average district in India in 1990 is 52% for the DTP as a whole, 40% for the PHI and 78% for the DTC. Table 2 also gives the treatment compliance which is about 33% for SR.

Table 2 (Please see next page)

The potential presented for the DTCs are based on observations at the Lady Willingdon Tuberculosis Demonstration Centre, Bangalore (all symptomatics eligible for sputum examination and 25% to be positive for AFB). The expectation of sputum positivity is taken as per the best that could be achieved by any DTC(ie., 18%).

Table 2

PERFORMANCE OF AN AVERAGE DTP

1. **Case detection**

	Potential	Expectation	Achievement	
			No.	%
DTC	500	500	390	78%
PHIs	2,000	1,120	445	40%
DTP	2,500	1,620	835	52%

2. **Treatment**

SR	Percent of patients completing ≥12 collections	:	33.0
SCC	Percent of patients making 75% or more collections	:	56.0

MEASUREMENT OF EFFICIENCY

i) **Sputum examination**

The efficiency of sputum examination, matched against the expectation calculated on the above manner, is presented for the DTCs and PHIs in table 3. It can be seen that the efficiency of the DTCs for sputum examinations is high throughout, except in West Bengal and Bihar. The same for PHIs is, on the other hand, very low. Of course, some states have achieved a high efficiency of sputum examination at PHI (Uttar Pradesh-122%, Maharashtra-91%, Punjab-73% and Tamil Nadu-66% of expectation). So this singles out sputum examination at the PHIs as one of the weeker points of the programme in most states.

Table 3 (Please see next page)

ii) **Case detection**

Table 4 presents the efficiency of the case detection in the DTCs and PHIs which again shows that most DTCs, except Assam, Bihar and Tamil Nadu performed near to expectation. Some states performed very close to the level of expectation (Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir-100%, Madhya Pradesh & Maharashtra-around 90%). With regard to the efficiency of case detection at the PHIs, it can be seen that while some states like Assam, Bihar, Himachal Pradesh, Kerala, Madhya Pradesh & Rajasthan performed at the level of nearly 15% or below, only Gujarat, Maharashtra & Uttar Pradesh performed beyond the

level of 55% of the expectation. This really constructs a disturbing scenario for us. Imagine Madhya Pradesh performing at 94% of the expectation at the DTCs, but only at about 11% at the PHI level. The low efficiency of case-finding at DTP can thus be safely attributed to the low performance of the PHIs almost everywhere.

Table 3

EFFICIENCY OF SPUTUM EXAMINATION - 1990 (AVERAGE/DTP)

Sl. No.	States/Union Territories	DTC			PHI			DTP
		Expectation	Performance	Efficiency %	Expectation	Performance	Efficiency %	Efficiency %
	India	2800	3437	123	14500	8540	59	69
1	Andhra Pradesh	4100	3508	86	21250	8551	40	48
2	Assam	2130	1696	80	8130	1236	15	29
3.	Bihar	3300	1671	51	6250	2958	47	48
4.	Gujarat	3200	3853	120	25000	14137	57	64
5.	Haryana	2020	5962	295	10380	5034	49	89
6.	Himachal Pradesh	620	2218	360	5630	1363	24	57
7.	Jammu & Kashmir	790	1497	189	3500	1435	41	68
8.	Karnataka	3300	2567	78	29750	7989	27	32
9.	Kerala	3140	3384	108	15630	7089	45	56
10.	Madhya Pradesh	2070	2777	134	16880	4603	27	39
11.	Maharashtra	3700	5097	138	25380	23208	91	97
12.	Orissa	3530	3123	88	21250	8894	42	48
13.	Punjab	2400	3036	127	10880	7910	73	82
14.	Rajasthan	2400	2226	93	10380	2169	21	34
15.	Tamil Nadu	5200	6555	126	33750	22461	66	75
16.	Uttar Pradesh	3530	3312	94	7500	9165	122	413
17.	West Bengal	6050	1650	27	14000	3674	26	27

Need for data rep. quality sensitive

Table 4

EFFICIENCY OF CASE DETECTION - 1990 (AVERAGE/DTP)

Sl. No.	States/Union Territories	DTC			PHI			DTP
		Expec-tation	Perfor-mance	Effi-cien-cy %	Expec-tation	Perfor-mance	Effi-cien-cy %	Effi-cien-cy %
	India	500	390	78	1120	445	40	52
1.	Andhra Pradesh	730	544	75	1700	456	27	41
2.	Assam	380	122	32	650	38	6	16
3.	Bihar	590	144	24	500	63	13	19
4.	Gujarat	570	655	115	2000	1104	55	68
5.	Haryana	360	369	103	830	206	25	48
6.	Himachal Pradesh	110	140	127	450	51	11	34
7.	Jammu & Kashmir	140	173	124	280	83	30	61
8.	Karnataka	590	299	51	2380	728	31	35
9.	Kerala	560	334	60	1250	188	15	29
10.	Madhya Pradesh	370	346	94	1350	146	11	29
11.	Maharashtra	660	587	89	2030	1450	71	76
12.	Orissa	630	351	56	1700	387	23	32
13.	Punjab	430	331	77	870	381	44	55
14.	Rajasthan	430	315	73	830	116	14	34
15.	Tamil Nadu	930	414	45	2700	734	27	32
16.	Uttar Pradesh	630	400	63	600	373	62	63
17.	West Bengal	1080	169	16	1120	360	32	37

DECADAL TREND

Whereas one has to be concerned about the low efficiency, as in the earlier paragraph, a few points need to be taken into consideration while according priorities in correcting some of the programme

activities. The number of sputum examinations has increased from 4,500 to 12,000 in the last decade. But the number of cases diagnosed has not been commensurate with this rise. Secondly, the proportion of smear positivity out of new sputa examined has shown a declining trend both at the DTC and PHI from 14% to 11.5% and 10% to 5.2% respectively during the decade.

POSSIBLE REASONS & SOLUTIONS

The low case-finding activity in DTP, assigned to be due to deficient activity at the PHI, may possibly be attributed to the following:

1. Improper selection of symptoms by the PHI medical officer.

2. Improper smear preparation and under-reading by the PHI microscopist.

3. Non-availability or non-maintenance of the microscopes (15-20% of the microscopes are estimated to be out of order at a point of time).

4. Attitude of the staff at the PHI.

5. Inadequate knowledge of the staff regarding the mode of diagnosis and treatment.

6. Possible decline in the prevalence rate of smear positive cases in the community and therefore the low smear positivity among new patients attending PHIs.

Both administrative and technical actions are called for to solve these problems.

ADMINISTRATIVE

Administrative priority

Though tuberculosis is a single major infectious disease and recognised to be a public health problem under the 20 Point Programme, it still lacks the requisite priority among major health programmes. It cannot be ignored that some of the national health programmes tend to work as powerful vertically oriented programmes, even though they use the health infrastructure designed for an integrated health care delivery. The malaria programme as well as the UIP can be mentioned in this connection, not considering the leprosy and family welfare programmes which are vertical health programmes by design, with various kinds of incentives being offered to all concerned! It is little realised that in the process, these programmes may in fact be weakening the fibre of general health care delivery system itself, by relegating its philosophy, objectives and activities to the background. It is true that, in pursuit of targets set by a few of these programmes, the medical officers of PHIs, in some instances, do not have the liberty

to accord a high priority even to out-patient care, which by all means, should be his basic function! He may often be required to be absent from his seat at the PHI discharging other duties outside! This could be undermining patients' faith in the institutions themselves to the detriment of programmes like DTP, whose success hinges on utilisation of the available services by the people! Moreover PHI staff seem to take note of the incongruity, that other programmes except tuberculosis have staff appointed specifically for the stipulated programme activities at the PHI and are paid from out of the designated funds. Tuberculosis programme, therefore, suffers in comparison.

The administrative action in this regard which should be taken at the central and state level authorities, is to allot equal priorities to all the national programmes, leaving out family planning, which alone can be a special case. There should be acceptance of integration as an operational necessity by all other national health programmes. The district administrative medical officers(DMOs) should review the family welfare programme as the last one in the list, sustaining interest in programmes like tuberculosis, UIP, malaria, general health etc., and allowing these to occupy some of the discussion time at their monthly review meetings. The DMOs should familiarise themselves with the programme dynamics in a manner enough to review the performances and display the required keenness.

Supervision

The monitoring data reveals a serious lacuna in the activity of supervision by the District Tuberculosis Officers(DTOs) (Table-5). It is usually put forward, as if as an alibi, that either the vehicles are not available or the available vehicles are put to all conceivable uses, other than for the DTP.

Table 5 (Please see next page)

The DMOs must rectify this situation urgently. Wherever vehicles are available with the DTOs, the administrative authority must insist upon the DTO to make the stipulated tours. Wherever vehicles are not available, an effort must be made to locate spare vehicles for use in DTP. Till that is done, several programme officers should be made to tour jointly.

Though the concept of joint tours by several programme officers is a right step towards achieving optimum use of the vehicles and fuel efficiency, yet it cannot be construed as a permanent solution. Each programme officer has to get the PHI doctor to devote adequate time to him separately in order to have an effective interaction during the supervision visit. Several programme officers, all demanding similar attention from a given PHI at the same time may not be conducive to a good communication situation. However, the alibi of not supervising the existing programme and not implementing unimplemented PHIs as given by the DTOs, should not be allowed to stand. The district administrative level officers have to somehow see to it that the DTOs carry out the job for which they are largely meant for, ie., implementation and supervision.

Table 5

SUPERVISION OF PERIPHERAL HEALTH INSTITUTIONS - 1990

Sl. No.	States/Union Territories	PHIs		
		Imple-mented	Super-vised	%
	India	15270	6413	42
1.	Andhra Pradesh	1215	595	49
2.	Assam	340	129	38
3.	Bihar	597	281	47
4.	Gujarat	1190	547	46
5.	Haryana	310	127	41
6.	Himachal Pradesh	376	128	34
7.	Jammu & Kashmir	123	81	66
8.	Karnataka	1720	740	43
9.	Kerala	545	114	21
10.	Madhya Pradesh	1877	432	23
11.	Maharashtra	1914	1225	64
12.	Orissa	689	172	25
13.	Punjab	325	39	12
14.	Rajasthan	693	263	38
15.	Tamil Nadu	1345	525	39
16.	Uttar Pradesh	1057	634	60
17.	West Bengal	567	74	13

Deployment of trained personnel

The DTP requires some organised involvement of staff both at the PHI and DTC level. The DTC staff trains the PHI staff on their visit to the respective PHIs. This is why in the previous para, a lot of stress has been laid on the DTO and his team visiting the periphery regularly. At all times, the implemented PHIs must have in position the staff who have been trained by the DTO and his key team.

However, it has come to light that for some strange reasons the DTCs themselves are not staffed by the NTI trained personnel. It will be impossible for the district team to achieve the results if members of their key staff themselves are not trained in the first place. NTI trains the key workers specifically for the programme administration. No level of academic qualification attained by the DTO or his team members could replace the training given at the NTI, since academic

training does not train the staff to carry out the programme activities. In some of the states the situation assumes alarming proportion, because of non-availability of trained personnel especially at DTCs, for ex., in Orissa, where most of the DTOs are not trained at the NTI. It becomes specifically difficult to comprehend the dynamics of this non-availability of the key staff at DTCs, since NTI runs two courses every year for all the programme personnel for years. It is for the states to utilise the training capability created for their benefit and manage the trained man-power in such a way that the centres are staffed properly.

TECHNICAL

Microscopy

The reason why case-finding at the district level is not fallen short of the expectation, whereas the same at the PHI is very low, probably rests heavily on the availability of a trained microscopist. Apart from the administrative aspects of the issue for not posting a microscopist at the PHI, it is possible that even when one is available, he is most likely to be on the pay roll of the malaria programme. More often, than not, he is not trained to carry out the sputum examination: either it has got something to do with his initial malaria service background or with the inefficiency of the DTC team to convince or train him.

The district management should waste no time to arrange adequate training to all microscopists working at PHIs to collect the sputum samples and examine them properly. The medical officers themselves should select the right persons for the sputum examination. The required technical training has to be imparted both to the medical officers and laboratory technicians by the DTO and his team during his supervisory visit. The training aspect could also be strengthened by the DTOs with the active involvement of the Regional Family Welfare Training Centres.

Microscope

Tuberculosis programme relies only on a simple microscope at the PHI for diagnosis. It is as simple as that! Still it requires the required attention from time to time. The district laboratory technician should help in servicing the equipment every now and then and train the PHI microscopist in microscopy care. the DMO should take appropriate action to replace or repair the same as the case may be.

Change in case content

Possibility of non-achievement of the desired sputum positivity at the PHIs could also be attributed generally to the dwindling of smear positive case content in the community as per some reports. The matter is being investigated by the NTI.

RECOMMENDATIONS

Only the very basic shortcomings in the performance under DTP and the reasons for these are short-listed above. The following points

need to be considered for action taking on related issues on a priority basis. This cannot serve as a comprehensive list of actions to be taken, but is designed only to underline the areas which can be improved with a little effort and to create the necessary awareness on these aspects among programme managers!

Research

Since there can be a change in the action taking pattern of patients and the proportion of smear positive cases in the community over the years, there is a need to study these to have a better estimate of the potential and expectation of other activities under the programme. Knowledge, attitude and skill of the PHI staff also require a study to find out the reasons for their preferential performance in some or other areas, if any.

Case-finding

i. Efforts are to be made to increase the coverage of available centres by implementing the programme in them. Action is to be taken by the DTO in consultation with the DMO and to be monitored by the State Health Directorate and the State Tuberculosis Officer(STO).

ii. The states should strengthen the PHC by filling up all vacant posts of microscopists and providing, if possible, an additional microscopist for every PHC. The provision of the central programme for imparting laboratory technician training of six month duration for PHCs, should be taken full advantage of by the states. Action is to be taken by the state level programme officer on minimum needs programme(MNP) and the DMO. The STO and DTO may play catalystic role.

iii. All programmes except family planning should get equal priority and to be carried out in an integrated manner. Action is to be taken by the central government in consultation with the state governments in this regard.

iv. Health & Family Welfare Training Centres should be equipped to impart training to the medical officers and Refresher Courses are to be held by them at least every year.

Apart from these four lead areas requiring prioritised attention, other points which can be identified as needing due consideration of the state/central governments are:

a. Creation of a monitoring cell at the state level as well as at the district level for all programmes including tuberculosis, which would continually identify the deficiency from the regular reports. The DTO may analyse the reports and regularly brief his district chief utilising the statistical assistant's services. The Health Secretary and Director of Health Services should display keen interest in the results of monitoring and take action on the identified deficiencies, in consultation with the STO every quarter (at least annually to start with).

b. A liaison is to be maintained with the district hospital specialists or medical colleges in the area, if any. Misunderstanding between participating units of the tuberculosis programme is more often, than not, due to lack of communication. This can be bridged by the DTO with the help of the DMO.

c. There is a long term need to develop the concept of supervision on an integrated basis to benefit all the health programmes. Research on this could be taken up at health research institutions, eg., NIHFW (Delhi) etc.

d. Maintenance of supply line and repair services at the district level calls for constant attention. The programme officers should not underestimate the need for carrying out a proper planning for procurement of drugs and materials in time and effecting as well as maintaining the supply line of the participating units.

e. Initial and sustained publicity should be given through media to create awareness among the public about the health facilities that are available in their respective areas, which can be made use of by the beneficiaries.

CONCLUSION

Various are the problems which face the DTP today. This is expected of a lively programme that changes with time in tune with the requirements of the situation. The administrative perception of the efficiency situation of the DTPs themselves keep on varying as a result of the exercise of matching the achievements with expectation, taking place within the system all the time. It is expected of the managers of the programme to take stock of the situation and plug the loopholes expeditiously, instead of allowing them to cumulate and acquire frightening dimensions over time.

The DTP in 30 years has achieved considerable success in coverage of the population with the required services. In absolute numbers case-finding has also gone up considerably during the last decade. Latest treatment facilities in the form of SCC is now available in places where even a few decades back no anti-tuberculosis services could have been expected. Still, we dwell here in this paper, mostly on the deficiencies and not on success, so that we are able to remove them and achieve the required potential. We endeavour to scale newer heights one after the other methodically, even while realising that the peak could still be far away.

AS THIS ISSUE IS IN PRESS, THE AUTHOR DR K.CHAUDHURI, RELINQUISHES THE CHARGE OF OFFICE AS THE DIRECTOR, NTI, BANGALORE, HAVING ATTAINED SUPERANUATION ON 31.1.1992.

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	Percent	:	67%
	Percent of PHIs covered under SCC	:	38%

that no DTP in any state has ever been able to approach anywhere near this potential. Therefore, it is considered that it could be a stiff, nay even unreal, estimate of the potential for the District Tuberculosis Centres(DTCs) to achieve! It could, on the other hand, be more practicable to consider the best performance figures achieved by any DTP anywhere in India to be the "**expectation**" for other performing DTPs! The performance of the DTPs are therefore matched against this expectation. Those who would realise these expectations would then be offered the challenge of achieving the "**potential**" as per NTI operational studies. In table 2, the "**expectation**" of an average DTP in India is shown to be 1,620: 1,120 for the PHI and 500 for the DTC. It can be observed that achievements of an average district in India in 1990 is 52% for the DTP as a whole, 40% for the PHI and 78% for the DTC. Table 2 also gives the treatment compliance which is about 33% for SR.

Table 2 (Please see next page)

The potential presented for the DTCs are based on observations at the Lady Willingdon Tuberculosis Demonstration Centre, Bangalore (all symptomatics eligible for sputum examination and 25% to be positive for AFB). The expectation of sputum positivity is taken as per the best that could be achieved by any DTC(ie., 18%).

Table 2

PERFORMANCE OF AN AVERAGE DTP

1. Case detection

	Potential	Expectation	Achievement	
			No.	%
DTC	500	500	390	78%
PHIs	2,000	1,120	445	40%
DTP	2,500	1,620	835	52%

2. Treatment

SR Percent of patients completing ≥12 collections : 33.0

SCC Percent of patients making 75% or more collections : 56.0

MEASUREMENT OF EFFICIENCY

i) Sputum examination

The efficiency of sputum examination, matched against the expectation calculated on the above manner, is presented for the DTCs and PHIs in table 3. It can be seen that the efficiency of the DTCs for sputum examinations is high throughout, except in West Bengal and Bihar. The same for PHIs is, on the other hand, very low. Of course, some states have achieved a high efficiency of sputum examination at PHI (Uttar Pradesh-122%, Maharashtra-91%, Punjab-73% and Tamil Nadu-66% of expectation). So this singles out sputum examination at the PHIs as one of the weeker points of the programme in most states.

Table 3 (Please see next page)

ii) Case detection

Table 4 presents the efficiency of the case detection in the DTCs and PHIs which again shows that most DTCs, except Assam, Bihar and Tamil Nadu performed near to expectation. Some states performed very close to the level of expectation (Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir-100%, Madhya Pradesh & Maharashtra-around 90%). With regard to the efficiency of case detection at the PHIs, it can be seen that while some states like Assam, Bihar, Himachal Pradesh, Kerala, Madhya Pradesh & Rajasthan performed at the level of nearly 15% or below, only Gujarat, Maharashtra & Uttar Pradesh performed beyond the

level of 55% of the expectation. This really constructs a disturbing scenario for us. Imagine Madhya Pradesh performing at 94% of the expectation at the DTCs, but only at about 11% at the PHI level. The low efficiency of case-finding at DTP can thus be safely attributed to the low performance of the PHIs almost everywhere.

Table 3

EFFICIENCY OF SPUTUM EXAMINATION - 1990 (AVERAGE/DTP)

Sl. No.	States/Union Territories	DTC			PHI			DTP
		Expectation	Performance	Efficiency %	Expectation	Performance	Efficiency %	Efficiency %
	India	2800	3437	123	14500	8540	59	69
1	Andhra Pradesh	4100	3508	86	21250	8551	40	48
2	Assam	2130	1696	80	8130	1236	15	29
3.	Bihar	3300	1671	51	6250	2958	47	48
4.	Gujarat	3200	3853	120	25000	14137	57	64
5.	Haryana	2020	5962	295	10380	5034	49	89
6.	Himachal Pradesh	620	2218	360	5630	1363	24	57
7.	Jammu & Kashmir	790	1497	189	3500	1435	41	68
8.	Karnataka	3300	2567	78	29750	7989	27	32
9.	Kerala	3140	3384	108	15630	7089	45	56
10.	Madhya Pradesh	2070	2777	134	16880	4603	27	39
11.	Maharashtra	3700	5097	138	25380	23208	91	97
12.	Orissa	3530	3123	88	21250	8894	42	48
13.	Punjab	2400	3035	127	10880	7910	73	82
14.	Rajasthan	2400	2226	93	10380	2169	21	34
15.	Tamil Nadu	5200	6555	126	33750	22461	66	75
16.	Uttar Pradesh	3530	3312	94	7500	9165	122	413
17.	West Bengal	6050	1650	27	14000	3674	26	27

Table 4

EFFICIENCY OF CASE DETECTION - 1990 (AVERAGE/DTP)

Sl. No.	States/Union Territories	DTC			PHI			DTP
		Expec-tation	Perfor-mance	Effi-cien-cy %	Expec-tation	Perfor-mance	Effi-cien-cy %	Effi-cien-cy %
	India	500	390	78	1120	445	40	52
1.	Andhra Pradesh	730	544	75	1700	456	27	41
2.	Assam	380	122	32	650	38	6	16
3.	Bihar	590	144	24	500	63	13	19
4.	Gujarat	570	655	115	2000	1104	55	68
5.	Haryana	360	369	103	830	206	25	48
6.	Himachal Pradesh	110	140	127	450	51	11	34
7.	Jammu & Kashmir	140	173	124	280	83	30	61
8.	Karnataka	590	299	51	2380	728	31	35
9.	Kerala	560	334	60	1250	188	15	29
10.	Madhya Pradesh	370	346	94	1350	146	11	29
11.	Maharashtra	660	587	89	2030	1450	71	76
12.	Orissa	630	351	56	1700	387	23	32
13.	Punjab	430	331	77	870	381	44	55
14.	Rajasthan	430	315	73	830	116	14	34
15.	Tamil Nadu	930	414	45	2700	734	27	32
16.	Uttar Pradesh	630	400	63	600	373	62	63
17.	West Bengal	1080	169	16	1120	360	32	37

DECADAL TREND

Whereas one has to be concerned about the low efficiency, as in the earlier paragraph, a few points need to be taken into consideration while according priorities in correcting some of the programme

activities. The number of sputum examinations has increased from 4,500 to 12,000 in the last decade. But the number of cases diagnosed has not been commensurate with this rise. Secondly, the proportion of smear positivity out of new sputa examined has shown a declining trend both at the DTC and PHI from 14% to 11.5% and 10% to 5.2% respectively during the decade.

POSSIBLE REASONS & SOLUTIONS

The low case-finding activity in DTP, assigned to be due to deficient activity at the PHI, may possibly be attributed to the following:

1. Improper selection of symptoms by the PHI medical officer.

2. Improper smear preparation and under-reading by the PHI microscopist.

3. Non-availability or non-maintenance of the microscopes (15-20% of the microscopes are estimated to be out of order at a point of time).

4. Attitude of the staff at the PHI.

5. Inadequate knowledge of the staff regarding the mode of diagnosis and treatment.

6. Possible decline in the prevalence rate of smear positive cases in the community and therefore the low smear positivity among new patients attending PHIs.

Both administrative and technical actions are called for to solve these problems.

ADMINISTRATIVE

Administrative priority

Though tuberculosis is a single major infectious disease and recognised to be a public health problem under the 20 Point Programme, it still lacks the requisite priority among major health programmes. It cannot be ignored that some of the national health programmes tend to work as powerful vertically oriented programmes, even though they use the health infrastructure designed for an integrated health care delivery. The malaria programme as well as the UIP can be mentioned in this connection, not considering the leprosy and family welfare programmes which are vertical health programmes by design, with various kinds of incentives being offered to all concerned! It is little realised that in the process, these programmes may in fact be weakening the fibre of general health care delivery system itself, by relegating its philosophy, objectives and activities to the background. It is true that, in pursuit of targets set by a few of these programmes, the medical officers of PHIs, in some instances, do not have the liberty

to accord a high priority even to out-patient care, which by all means, should be his basic function! He may often be required to be absent from his seat at the PHI discharging other duties outside! This could be undermining patients' faith in the institutions themselves to the detriment of programmes like DTP, whose success hinges on utilisation of the available services by the people! Moreover PHI staff seem to take note of the incongruity, that other programmes except tuberculosis have staff appointed specifically for the stipulated programme activities at the PHI and are paid from out of the designated funds. Tuberculosis programme, therefore, suffers in comparison.

The administrative action in this regard which should be taken at the central and state level authorities, is to allot equal priorities to all the national programmes, leaving out family planning, which alone can be a special case. There should be acceptance of integration as an operational necessity by all other national health programmes. The district administrative medical officers(DMOs) should review the family welfare programme as the last one in the list, sustaining interest in programmes like tuberculosis, UIP, malaria, general health etc., and allowing these to occupy some of the discussion time at their monthly review meetings. The DMOs should familiarise themselves with the programme dynamics in a manner enough to review the performances and display the required keenness.

Supervision

The monitoring data reveals a serious lacuna in the activity of supervision by the District Tuberculosis Officers(DTOs) (Table-5). It is usually put forward, as if as an alibi, that either the vehicles are not available or the available vehicles are put to all conceivable uses, other than for the DTP.

Table 5 (Please see next page)

The DMOs must rectify this situation urgently. Wherever vehicles are available with the DTOs, the administrative authority must insist upon the DTO to make the stipulated tours. Wherever vehicles are not available, an effort must be made to locate spare vehicles for use in DTP. Till that is done, several programme officers should be made to tour jointly.

Though the concept of joint tours by several programme officers is a right step towards achieving optimum use of the vehicles and fuel efficiency, yet it cannot be construed as a permanent solution. Each programme officer has to get the PHI doctor to devote adequate time to him separately in order to have an effective interaction during the supervision visit. Several programme officers, all demanding similar attention from a given PHI at the same time may not be conducive to a good communication situation. However, the alibi of not supervising the existing programme and not implementing unimplemented PHIs as given by the DTOs, should not be allowed to stand. The district administrative level officers have to somehow see to it that the DTOs carry out the job for which they are largely meant for, ie., implementation and supervision.

Table 5

SUPERVISION OF PERIPHERAL HEALTH INSTITUTIONS - 1990

Sl. No.	States/Union Territories	PHIs		
		Imple-mented	Super-vised	%
	India	15270	6413	42
1.	Andhra Pradesh	1215	595	49
2.	Assam	340	129	38
3.	Bihar	597	281	47
4.	Gujarat	1190	547	46
5.	Haryana	310	127	41
6.	Himachal Pradesh	376	128	34
7.	Jammu & Kashmir	123	81	66
8.	Karnataka	1720	740	43
9.	Kerala	545	114	21
10.	Madhya Pradesh	1877	432	23
11.	Maharashtra	1914	1225	64
12.	Orissa	689	172	25
13.	Punjab	325	39	12
14.	Rajasthan	693	263	38
15.	Tamil Nadu	1345	525	39
16.	Uttar Pradesh	1057	634	60
17.	West Bengal	567	74	13

Deployment of trained personnel

The DTP requires some organised involvement of staff both at the PHI and DTC level. The DTC staff trains the PHI staff on their visit to the respective PHIs. This is why in the previous para, a lot of stress has been laid on the DTO and his team visiting the periphery regularly. At all times, the implemented PHIs must have in position the staff who have been trained by the DTO and his key team.

However, it has come to light that for some strange reasons the DTCs themselves are not staffed by the NTI trained personnel. It will be impossible for the district team to achieve the results if members of their key staff themselves are not trained in the first place. NTI trains the key workers specifically for the programme administration. No level of academic qualification attained by the DTO or his team members could replace the training given at the NTI, since academic

training does not train the staff to carry out the programme activities. In some of the states the situation assumes alarming proportion, because of non-availability of trained personnel especially at DTCs, for ex., in Orissa, where most of the DTOs are not trained at the NTI. It becomes specifically difficult to comprehend the dynamics of this non-availability of the key staff at DTCs, since NTI runs two courses every year for all the programme personnel for years. It is for the states to utilise the training capability created for their benefit and manage the trained man-power in such a way that the centres are staffed properly.

TECHNICAL

Microscopy

The reason why case-finding at the district level is not fallen short of the expectation, whereas the same at the PHI is very low, probably rests heavily on the availability of a trained microscopist. Apart from the administrative aspects of the issue for not posting a microscopist at the PHI, it is possible that even when one is available, he is most likely to be on the pay roll of the malaria programme. More often, than not, he is not trained to carry out the sputum examination: either it has got something to do with his initial malaria service background or with the inefficiency of the DTC team to convince or train him.

The district management should waste no time to arrange adequate training to all microscopists working at PHIs to collect the sputum samples and examine them properly. The medical officers themselves should select the right persons for the sputum examination. The required technical training has to be imparted both to the medical officers and laboratory technicians by the DTO and his team during his supervisory visit. The training aspect could also be strengthened by the DTOs with the active involvement of the Regional Family Welfare Training Centres.

Microscope

Tuberculosis programme relies only on a simple microscope at the PHI for diagnosis. It is as simple as that! Still it requires the required attention from time to time. The district laboratory technician should help in servicing the equipment every now and then and train the PHI microscopist in microscopy care. the DMO should take appropriate action to replace or repair the same as the case may be.

Change in case content

Possibility of non-achievement of the desired sputum positivity at the PHIs could also be attributed generally to the dwindling of smear positive case content in the community as per some reports. The matter is being investigated by the NTI.

RECOMMENDATIONS

Only the very basic shortcomings in the performance under DTP and the reasons for these are short-listed above. The following points

need to be considered for action taking on related issues on a priority basis. This cannot serve as a comprehensive list of actions to be taken, but is designed only to underline the areas which can be improved with a little effort and to create the necessary awareness on these aspects among programme managers!

Research

Since there can be a change in the action taking pattern of patients and the proportion of smear positive cases in the community over the years, there is a need to study these to have a better estimate of the potential and expectation of other activities under the programme. Knowledge, attitude and skill of the PHI staff also require a study to find out the reasons for their preferential performance in some or other areas, if any.

Case-finding

i. Efforts are to be made to increase the coverage of available centres by implementing the programme in them. Action is to be taken by the DTO in consultation with the DMO and to be monitored by the State Health Directorate and the State Tuberculosis Officer(STO).

ii. The states should strengthen the PHC by filling up all vacant posts of microscopists and providing, if possible, an additional microscopist for every PHC. The provision of the central programme for imparting laboratory technician training of six month duration for PHCs, should be taken full advantage of by the states. Action is to be taken by the state level programme officer on minimum needs programme(MNP) and the DMO. The STO and DTO may play catalystic role.

iii. All programmes except family planning should get equal priority and to be carried out in an integrated manner. Action is to be taken by the central government in consultation with the state governments in this regard.

iv. Health & Family Welfare Training Centres should be equipped to impart training to the medical officers and Refresher Courses are to be held by them at least every year.

Apart from these four lead areas requiring prioritised attention, other points which can be identified as needing due consideration of the state/central governments are:

a. Creation of a monitoring cell at the state level as well as at the district level for all programmes including tuberculosis, which would continually identify the deficiency from the regular reports. The DTO may analyse the reports and regularly brief his district chief utilising the statistical assistant's services. The Health Secretary and Director of Health Services should display keen interest in the results of monitoring and take action on the identified deficiencies, in consultation with the STO every quarter (at least annually to start with).

b. A liaison is to be maintained with the district hospital specialists or medical colleges in the area, if any. Misunderstanding between participating units of the tuberculosis programme is more often, than not, due to lack of communication. This can be bridged by the DTO with the help of the DMO.

c. There is a long term need to develop the concept of supervision on an integrated basis to benefit all the health programmes. Research on this could be taken up at health research institutions, eg., NIHFW (Delhi) etc.

d. Maintenance of supply line and repair services at the district level calls for constant attention. The programme officers should not underestimate the need for carrying out a proper planning for procurement of drugs and materials in time and effecting as well as maintaining the supply line of the participating units.

e. Initial and sustained publicity should be given through media to create awareness among the public about the health facilities that are available in their respective areas, which can be made use of by the beneficiaries.

CONCLUSION

Various are the problems which face the DTP today. This is expected of a lively programme that changes with time in tune with the requirements of the situation. The administrative perception of the efficiency situation of the DTPs themselves keep on varying as a result of the exercise of matching the achievements with expectation, taking place within the system all the time. It is expected of the managers of the programme to take stock of the situation and plug the loopholes expeditiously, instead of allowing them to cumulate and acquire frightening dimensions over time.

The DTP in 30 years has achieved considerable success in coverage of the population with the required services. In absolute numbers case-finding has also gone up considerably during the last decade. Latest treatment facilities in the form of SCC is now available in places where even a few decades back no anti-tuberculosis services could have been expected. Still, we dwell here in this paper, mostly on the deficiencies and not on success, so that we are able to remove them and achieve the required potential. We endeavour to scale newer heights one after the other methodically, even while realising that the peak could still be far away.

AS THIS ISSUE IS IN PRESS, THE AUTHOR DR K.CHAUDHURI, RELINQUISHES THE CHARGE OF OFFICE AS THE DIRECTOR, NTI, BANGALORE, HAVING ATTAINED SUPERANUATION ON 31.1.1992.

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National TB Programme, Its Development, Concepts, Monitoring and Evaluation Aspects

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Tuberculosis in India began to engage attention as a public health problem from the early part of this century. Most of the early attempts to provide treatment for TB patients which meant at that time isolating the patients, in far off sanatoriums located in the hills etc. were made by various philanthropic Societies and individuals on compassionate grounds. The first open air sanatorium for isolation of TB patients was founded in 1906 in Tilaunia near Ajmer in Rajasthan, followed by establishment of similar institutions at Almorah (U. P.), Pandara Road (M. P.), Madnapalle etc. In 1910, Sir Pardly Lukis, the then Directer General of Indian Medical Services highlighted for the first time the problem of tuberculosis in the country and similar observations were made in the All India Sanitary workers' Conference in 1912. During the same decade Dr. Lankaster also confirmed that tuberculosis was a widely prevalent disease in the country and subsequently Dr. Leonard Rogers on the basis of analysis of postmortem reports concluded that about 17 per cent of total deaths in Calcutta were due to tuberculosis. In 1930's, limited tuberculin surveys were carried out in some parts of South India and West Bengal which showed a high rate of infection in the urban and semi urban areas. As a result of public opinion gathering strength demanding action to deal with the increasing menance of tuberculosis, the first concerted effort was made through the organisation of the King George Fifth Thanks Giving Fund in 1929. With the funds raised by this organisation, the Tuberculosis Association of India, a premier Voluntary body organisation, was established in 1939. In 1944, the first Health Survey and Development Committee popularly known as the Bhore Committee after assessing the overall situation recommended provision of comprehensive tuberculosis services throughout the country. As a consequent to this recommendation and as a first step, the office of the Tuberculosis Adviser was created in the Directorate General of Health Services in the year 1948, to plan effective anti TB measures throughout the country, and BCG vaccination was introduced for the first time in the country as a pilot project, in South India, in 1948, which was later extended as a school vaccination programme launched in 1949-51. The mass BCG Vaccination Campaign launched in 1951 gave the first indication that the problem of tuberculosis in the rural areas could be as big as that in the urban areas.

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Epidemiological scene of Tuberculosis in India

India is one of the few developing countries of the world, where epidemiology of pulmonary tuberculosis has been studied fairly extensively and for a long time. In most of the epidemiological studies conducted by different experts or by different organisations and Institutions one or more of the 3 main epidemiological tools viz. tuberculin test, Chest X-ray examination and bacteriological examination of sputum have been employed to study the prevalence and incidence of tuberculosis infection and prevalence and incidence of abacillary and bacillary pulmonary tuberculosis The information regarding the mortality rates due to tuberculosis, has been unreliable because of the well known difficulties in notification of deaths and ascertaining the exact cause of death in an individual under the existing situation in our country. The first National Sample TB Survey was conducted by the ICMR in six Zones of the country in the years 1955-58. Limited studies on the morbidity pattern have been conducted in localised groups of population in different parts of the country thereafter in Delhi, Madanapalle, Thumkur area of Karnataka by National TB Institute Bangalore, Chingelput district of Tamil Nadu and the last one in Kashmir Valley by ICMR in 1980-81. The findings of all these morbidity surveys have almost firmly indicated that the prevalence of tuberculosis remains almost the same through all these years, though there are some indications that the problem may be showing a slow downward trend, especially in these areas where the services are well orgainsed. In any case, it can be submised with a fair degree of certainty, that there is no increase in the prevalence rate due to tuberculosis during all these three decades. The available data indicates the following main epidemiological dimensions of the problem of tuberculosis in the country viz.,

(1) The prevalence of infection as evinced by tuberculin test is of the order of about 40 per cent in all age groups rising from about 2 per cent in the youngest age group to about 70 per cent at the age of 35 years. Further, the incidence of infection is highest in the individuals between the ages of 5 and 20 years, and the risk of the infection is about 2 per cent per annum.

(2) The prevalence of radiologically active TB disease of the lungs is of the order of about 1.8 per cent amongst the population aged 10 years or more, and of these, about 1/4th i.e. 0.4 per cent are sputum positive or infectious. The annual incidence of the new cases is estimated to be about 1/3rd of the prevalence rate.

(3) The prevalence as well as the incidence of the disease is higher in the elderly age group and is comparatively more in the males as compared to females.

(4) The prevalence rate of TB disease is almost the same in the rural and urban areas. As nearly 76 per cent of our total population lives in about 5, 75, 000

villages, the bulk of the TB patients would be found in the rural populace and thus there would be at least about 2-3 sputum positive cases in each of our villages with an average population of about 700 each and about 8-12 persons would be suffering from radiologically active TB disease of the lungs, at any point of time.

(5) The prevalence rate of tuberculosis is higher in those groups of population whose socio-economic condition is not staisfactory and who are living in 'kutcha houses' or in slums in congested localities under unhygenic conditions.

(6) The non specific sensitivity is highly prevalent throughout the country though it is definitely lower in areas located at higher altitudes.

(7) The mortality rate due to Tuberculosis are estimated to be about 80-100 per One lac population. In these areas where intensive anti-tuberculosis measures have been introduced the rates have however significantly come down.

Thus, tuberculosis continues to be a major public health problem in the country and it is estimated that at present there may be about 10 million persons suffering from radiologically active TB disease of the lungs of which about 2.2 to 2.5 million would be sputum positive or infectious.

Formulation of National TB Control Programme—Its performance over the years

Way back in 1966, the controlled clinical trials conducted by TB chemotherapy centre Madras, now known as TB Research Centre, firmly indicated that domiciliary treatment of TB patients is as effective as sanatorium treatment and the role of extra nutritious diet, absolute bed rest etc. in the management of TB patients is hardly of any significance. With the morbidity pattern of Tuberculosis revealed by National Sample TB Survey, conducted in the same years, when it was proved that the problem of tuberculosis in the country is essentially a rural one, the Government of India in 1959, established the National TB Institute at Bangalore to evolve nationally applicable TB Control Programme which can possibly suit our requirements. After extensive field research, the institute evolved the concept of District TB Programme for application throughout the country which was recammended to the State Governments for implementation in 1962. Basically, the District TB Programme envisages a permanent country wide programme based on relevant epidemiological, technical, administrative and financial considerations and is integrated into the general health and medical services at both the rural and the urban levels. Today 360 major districts of the country have been covered under the ambit of District TB Programme and nearly 12,000 peripheral health and medical institutions are involved in case finding and treatment activities, though not to the extent to which we would have liked. More recently, with the implementations of health workers scheme in the rural areas, the health workers of the primary health centres

have also been entrusted the task of case finding, case holding and BCG Vaccination activities. In addition, the recently formed cadre of village health guides, have also been involved in the basic aspect of health education of the community and other essential activities under TB Programme. Simultaneously, the Primary Health Care itself, is being strengthened by establishment of more number of Primary Health Centres, Sub-Centres, Community Health Centres and Subsidiary Health Centres.

Monitoring and Evaluation of the National Programme

The National TB Programme has the twin objectives, namely,

(a) Long term objective—which is to reduce tuberculosis in the community to that level when it ceases to be a public health problem i.e.—

(i) One case infects less than one new person annually;

(ii) the prevelance of infection in age group 14 years is brought down to less than 1 per cent against about 30 per cent as at present.

(b) Operational or short term objectives—

(i) to detect maximum number of TB patients among the outpatients attending any health institution with symptoms suggestive of tuberculosis and to treat them effectively;

(ii) to vaccinate new borns and infants with BCG vaccination; and

(iii) to undertake the above objective in an integrated manner through all the existing health institutions of the country.

For the success of any National Programme, monitoring and evaluation has to be taken up concurrently. It is particularly important for the National TB Programme because of the long period of time required to achieve control of this disease in the country. The main purpose of monitoring is to keep a close watch on the performance of various activities of the Tuberculosis Programme as highlighted above, so that wherever shortfalls are observed, necessary corrective action is taken. There is a provision for two tier reporting system under the National TB Programme, one from the peripheral health institutions to the district TB centres and other from the District TB Centres to the State Directorate, National TB institute Bangalore and the Directorate General of Health Services. The reports are prepared by the District TB Centres on a special design standard forms and are submitted on a periodical, regular and continuous basis. The reports provide information on—

(i) the number of reporting centres vis-a-vis number of implementing centres.

(ii) position of the trained staff.

(iii) condition of various equipments available.

(iv) Diagnostic and treatment activities undertaken at various levels, etc.

The performance of each Centre is matched with expectations and the reasons for shortfalls are identified and the programme performance is far below the expectations, then the reasons for such shortfalls has to be gone into and necessary corrective actions has to be taken.

There is no machinery at present to study tuberculosis situation systematically on a community wide and permanent basis excepting three isolated surveys done in different parts of the country from which inferences are drawn on the tuberculosis situation in the country. The National TB Institute is working on a methodology in which the measurement of a suitable index is done at pre-determined intervals in order to study the trend of the disease in the community. It is proposed to organise repeated estimates of prevalence of tuberculosis infection in 0-9 years age group in the community on a country wide basis at intervals of 5 years to find out any possible decline in the trend of the disease in the area.

2.23

The Rationale of T.B. Control Programme

Epidemiological Perspective

- Prepared by "ARCH" Mangrol
for 1985 GVHA Convention.

Like all other infectious diseases, T.B. has its own peculiarities and characteristics. Unless this is firmly grasped, the adequate understanding of T.B. Control programme is impossible. One of the ways these peculiarities manifest themselves is to be seen in the fact that only in T.B. and Leprosy (which in many respects is like T.B.) the control of the infection in the community is very closely linked with treatment of individual cases. In all other infections, treatment of individual cases either has no place in control programme or has marginal role in the over-all strategy of the control programme. In T.B., treatment of individual cases dominate the strategy almost completely. This may create a misunderstanding in our minds that T.B. control programme is, after all, curative medicine with no preventive component.

For a group that is committed to primacy of prevention over cure, this state of affair may not be intuitively satisfactory. This note is also an attempt to dispel such misgivings, if they are there.

(I) T.B. - infection and disease:

T.B. is unique amongst all the infectious diseases in that its germs, having entered the human body multiply in the lungs and various organs, producing what is called infection, but not overt disease in all the victims in whom they have managed to enter. The Tuberculous germs, thereafter, may be overcome by the body's defence system and eliminated completely or may be forced to go into a dormant state. In a small proportion of cases where the body's defences are overwhelmed, Tuberculous disease is manifested, which is the only portion of the total cases of T.B. infection that is apparent to our day-to-day common perception.[1]

The things get a bit more complicated, because the portion T.B. infection in a community, which is dormant can get reactivated any time during life, producing the overt disease T.B.. This gives T.B. infection an extraordinarily large variability of incubation period. A person once infected, and in whose body the germs lie dormant, can become diseased anytime during life.

The spread of T.B. infection:

* The spread of the T.B. infection occurs by transmission of bacteria mostly from person to person and in some cases from cattle to human being, (bovine T.B.). The spread from person to person occurs almost exclusively through air.

JN
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[1] In a situation like ours there are 300 per 1000 who are infected but only 4 to 6 per 1000 who are diseased

* All the infected persons cannot excrete the germs in the air. Only those infected and who have T.B. disease of the lung and who are actively coughing out the T.B. germs in the sputum are the ones who spread infection. The T.B. disease of organs other than the lungs (extrapulmonary T.B.) occurs through blood following primary infection. The proportion of extra pulmonary T.B. disease is quite small compared to lung T.B. disease. Extra pulmonary diseases are, therefore, of little consequence in so far as spread of T.B. infection is concerned.

  Two important points, from the point of T.B. control may be made here.

  (a) Only lung cases who are coughing out T.B. germs in their sputum (Sputum positive- open cases of T.B.) are responsible for spread of infection in a community.

  (b) These open cases of T.B. arise at different intervals and at different rates from those who are infected with T.B. germs.

* T.B. infection is a very slow infection, i.e. it spreads very slowly. A prolonged contact with a case of T.B. is necessary, which explains concentration of cases in families.

(II) Factors responsible for the spread of infection in families:

(a) Infection in family contact is closely related to the extent of disease and sputum positivity of the source case.

(b) Next in line is overcrowding- measured as cubic feet per person and subjective assessment of intimacy of contact -.

(c) Surprisingly enough, the household income purse is not of much importance, while what household furnishings the families purchase with their income seems to be a factor of considerable significance.

(d) Contrary to our expectations, nutrition is not a factor of any importance in the spread of infection.

(e) Infectiousness of T.B. patients decline rapidly by adequate treatment. Thus a patient who is on chemo-therapy stops infecting others although he may still be sputum positive. This is so because germs in the sputum do not remain viable once the chemotherapy starts. This is, what is called, 'Chemical isolation' - an important point from the point of view of prevention of transmission in practical terms.

(III) Factors responsible for manifestation of T.B. disease:

Contrary to T.B. infections where the risk factors are extrinsic, the risk factors in the development of the disease are largely intrinsic.

(a) Different infected populations develop T.B. disease at very different rates. e.g., risk of developing T.B. disease in Eskimos is 20 times more than that in the infected, non-urban Danish population.

(b) Young, adult, infected women are at higher risk of developing T.B. disease than young, adult, infected males.

(c) Housing, including overcrowding and ventilation, is of no importance.

(d) Importance of nutrition is also of a peculiar character. Only those who weigh 10% or more of their average expected weight are at lower risk of developing T.B. disease. Those with lower weights have proportionately increased rate of T.B. disease.

(IV) Strategy of T.B. Control in the light of Epidemiological Insights:

Theoretically to control the infectious disease in a community the strategy should be directed at :

i) source and reservoir of the infectious germs;

ii) the routes of transmission of the germs to the susceptible human beings via media like water, food, air, insects;

(iii) strengthening the defence mechanisms of susceptible individuals against the invading germs, e.g. - Vaccination -.

The most important components of T.B. control programme are:

i) Case detection, and

ii) Case holding for the whole length of time during which chemotherapy is instituted. How does this strategy help control T.B. in a community ?

(a) We know that the germs of T.B. theoretically are to be found in all the open cases of pulmonary T.B., in all the cases of extra-pulmonary T.B. and in all who are infected and have T.B. germs lying dormant in their bodies, which can become active any time during the life in a most unpredictable manner and produce the disease. However the open cases transmit the infection most and also T.B. germs

can be detected much more easily in the open cases. It is also true that the suffering and death is to be found only in T.B. disease, pulmonary or extra-pulmonary, and not in the third category in which the germs are lying dormant. In the T.B. disease category, also, overwhelmingly large proportion of the disease is pulmonary T.B.

In practice, therefore, an attack against the source of infection has to be confined to the open cases of T.B. And as long as the detected open cases are treated adequately, they are effectively removed from the most active part of the part of infection in a community. And this matters most. This explains the emphasis given in T.B. control programmes to case detection and case holding. This also explains why case detection is most reliable by microscopic examination of sputum to detect T.B. germs directly and unumportance of X-ray as a method of diagnosis. (Screening of the chest is not even worth mentioning.) This also explains the apparent curative orientation of control programme which, in fact, is the best available means to check the transmission- the best possible way to prevent T.B.

(b) The reason why T.B. control programme ignores the classical, preventive measures like improving sanitation housing etc. has also to do with the peculiarities of its epidemiology. Improvement in housing, specifically reducing the over-crowding has an influencing effect on T.B. infection. But, it cannot influence sufferings and deaths. It also cannot have any influence on the clearing of a huge backlog of existing infection in the community which will continue to generate hundreds of thousands of new cases of T.B. disease for many decades to come. It is also of secondary importance in checking the transmission of the infection of T.B. germs, when compared with the chemical isolation of active cases of T.B. disease in a family. This, however, should not lead to an interpretation that improvement in housing should be outside the limits of the strategy of T.B. control, as is the case to-day. In fact, improvement in housing does not only affect transmission of T.B., but also cuts down transmission of many other infections. No community health movement of some worth can drop the demand for the improvement of housing for poor.

(c) This brings us to the thrid component of strategy of controlling infectious diseases in the community: protection of all individuals against the infection by vaccination. What is the role of B.C.G. vaccine in T.B. control programme ?

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6th November 1985

MEDICO FRIEND CIRCLE - ANNUAL MEET 1985

BACKGROUND PAPER

EVOLUTION OF THE NATIONAL TUBERCULOSIS PROGRAMME

by GD Gothi, Dir-NDelhiTBcentre, Source NTI Newsletter (1981) 18:22.

As in most other countries of the world, the first anti-tuberculosis measures taken in India were of an unplanned adhoc nature, confined mainly to the establishment of hospitals and sanatoria. Partly due to lack of resources and partly to preoccupation with epidemics such as plague, smallpox, cholera, etc. scant attention was paid to the development of a tuberculosis policy. In most places, even rudimentary diagnostic facilities were absent.

The concept of control of tuberculosis in the country was first mooted in 1920 and efforts for control were through the organization of the King George V Thanks Giving Fund. The Funds so collected were utilised through the Indian Red Cross Society primarily for preventive and educational activities, establishment of clinics, training of health visitors and preparation of health education material. In 1939, the Tuberculosis Association of India was established with the object of providing expert advice, evolving standard methods to deal with the disease, setting up of model institutions for training of tuberculosis workers, education of public regarding preventive measures and organising meetings and conferences for scientific discussions. The activities of the Association at its inception were to chalk out programmes, encourage establishment of clinics, dispensaries and sanatoria, undertake research in communitywide management of tuberculosis and to serve as an advisory bureau.

Recognising the enormity and complexity of the disease and to meet the needs of large number of tuberculosis patients, the Tuberculosis Association conceived the idea of domiciliary treatment as early as in 1940. It established the New Delhi TB Clinic (now known as New Delhi TB Centre) to try out the efficiency of domiciliary treatment by offering collapse therapy from out-patient department and to guide patients and their contacts regarding preventive measures. The method was found acceptable and applicable and the experiment satisfying.

The Association established Lady Linlithgow Sanatorium in Kasauli, Simla Hills, to demonstrate model sanatorium services. These institutions were also entrusted with the responsibility of training medical and para medical workers.

PLANNING OF CONTROL OF THE DISEASE

At the instance of the Central Government, the Health Survey and Development Committee headed by Sir Joseph Bhore (1), for the first time, outlined a conventional phased scheme for management of tuberculosis in 1946.

For reasons of scarcity of resources and impracticability, the scheme could not be implemented. The administrator, however, could not ignore the suffering of patients and the public demand for definite action, even though the facilities for diagnosis and treatment were lacking. After independence, in 1948, the Tuberculosis Sub-Committee of the Health Panel of the National Planning Commission, drew up a programme for dealing with tuberculosis and suggested application of BCG vaccination, which was considered to be the only measure for prevention and control of the disease and was expected to yield good results within the resources available in the foreseeable future. Following the

acceptance of the proposal by the Planning Commission, a nation-wide BCG programme was started in 1951. On the assumption that the disease was primarily a problem of thickly populated urban areas, and slums, the programme was first introduced in cities and towns. Thereafter, the BCG teams were shifted to rural areas. As per conventional procedure, the population was tuberculin tested prior to vaccination to identify tuberculin non-reactor eligibles for BCG vaccination. The country-wide tuberculin testing revealed high prevalence of tuberculous infection both in rural (2) and urban areas which was contrary to the earlier impressions that tuberculosis was mainly a problem of crowded urban areas. A country-wide tuberculosis sample survey (3) to get information on prevalence of disease in various strata of the country was therefore considered necessary.

ESTIMATION OF THE EXTENT OF THE TUBERCULOSIS PROBLEM

A large scale sample survey was conducted in six zones of the country covering urban and rural populations under the auspices of the Indian Council of Medical Research (3) in 1955-58 to get as precise an information as possible about the magnitude of the tuberculosis problem in the country. The survey covered a total population of about 3,00,000 persons residing in urban, semi-urban and rural areas of the country. The survey confirmed the impression of high prevalence of tuberculosis morbidity in rural areas, that had earlier been revealed by large scale tuberculin testing. It was estimated that of the eight million people suffering from tuberculosis about 80% were in the rural areas.

TOOLS AND TECHNIQUES

The discovery of specific, potent, cheap and readily available antitubercular drugs and the efficiency of domiciliary treatment proved by the New Delhi TB Centre (4) and Tuberculosis Chemotherapy Centre, Madras (5) completely changed the outlook for TB patients. The probability of formulating a comprehensive tuberculosis programme to combat the disease on a community-wide basis seemed possible.

The control measures for tuberculosis could not be different from those commonly known for control of any other infectious disease, i.e., preventive vaccination, case-finding and treatment. The available tools for the control of tuberculosis consisted of BCG vaccination for prevention, chest radiography and sputum microscopy for casefinding and ambulatory domiciliary chemotherapy for treatment. The problem was how to apply these tools. There was a wide gap between knowledge and its application. An objective and systematic approach for formulation of sound policies for tackling the problem of tuberculosis was urgently needed. What should be the organisation and resources in terms of trained personnel, equipment, drugs etc. The manner the tools were to be applied and techniques to be employed were some of the questions that remained to be answered. The National Tuberculosis Institute (NTI) was established in 1959 in Bangalore by the Government of India to evolve a programme which would answer these questions and be feasible and suitable for both rural and urban areas of the country. The Institute was given the responsibility of training tuberculosis workers and continuing research for modification and evolution of the programme in the light of newer knowledge.

THE PROGRAMME EVOLUTION

The evolution of the National Tuberculosis Programme (NTP) was based on a number of factors related to epidemiological, sociological, operational, technical and administrative aspects. Information on these aspects was obtained from studies conducted in different parts of the country which were reviewed prior to formulation of the programme. In addition, the NTI conducted epidemiological, sociological and operational studies to enunciate suitable methods for large scale application of BCG vaccination, case-finding and case-holding. Salient findings of some of the studies that were made use of for planning the NTP are presented below.

EPIDEMIOLOGICAL BASIS

The epidemiological data that were considered were obtained from tuberculosis surveys conducted by ICMR (1955-58) (3). Studies were also undertaken in Delhi (6), Madanapalle (7) and Bangalore (8). These studies revealed that infection and disease were widespread. Out of the total population of the country, about 50% was infected with M.tuberculosis and about 0.5% aged 5 years and above suffered from bacillary disease. The disease was evenly distributed in rural and urban areas and was more frequent in males, especially in the higher age groups. The annual incidence of disease was found to be 1-3 per thousand (9) i.e., 1/3rd of the prevalence at any point of time. There was a time lag between infection and development of the disease suggesting that new cases of tuberculosis would continue to develop from the already infected population for many years to come.

These epidemiological findings demanded that tuberculosis services be so organized as to cover the entire country, on a permanent basis since cases would continue to arise all the time, all over the country. Priority had to be given to finding sputum positive patience to prevent the spread of infection.

SOCIOLOGICAL CONSIDERATIONS

Socio-economic conditions in any country have wide implications for programme planners. The importance of the tuberculosis problem from the social angle has to be considered in relation to other health and social needs of the country. Resources are the main constraints for formulation of the programme.

A sociological study (10) conducted at the NTI had shown that 95% of sputum positive patients were aware of their symptoms and that nearly half of them had reported at various health institutions in search of relief for their chest symptoms. On the basis of this information it was estimated that about half of the total 5000 infectious cases in an average district with a population of about 1.5 million attended the general health institutions. Out of these about 2000 could be easily discovered through sputum microscopy, at the first point of contact in a network of general health services.

Ideally, all the 5000 cases should be found in the shortest possible time but operationally this was not considered likely. Finding of 2000 cases however, per district per year, it was thought, would be a good achievement. Their satisfactory treatment and sputum conversion could be expected to result

in reduction of the tuberculosis problem within a few years. However, the service, to be effective, has to be offered near to the patients' residence.

OPERATIONAL CONSIDERATIONS

Case-finding, to produce any impact on the problem of tuberculosis had to be aimed at discovering a substantial number of cases per unit time and was required to be carried out both in rural and urban areas on a long term basis rather than as a one-time effort. Operational studies (II) for case-finding through mobile teams, with or without tuberculin test, the use of mass miniature radiography and examination of sputum alone or in various combinations were carried out in villages, primary health centres and at the district head-quarters hospitals. The application of mobile X-ray units for tuberculosis case-finding through specialised peripetetic tuberculosis teams in villages was found operationally impractible and infructuous. The number of cases found was no better than that found at the primary health centres and other rural dispensaries and hospitals, from amongst those who report by themselves for relief of their ailment (12). Operationally, for reasons of poor approach roads to villages, inadequacy or absence of facilities for maintenance and repairs, shortage of X-ray films, and staff to operate the X-ray units and exorbitant running cost, the use of mobile mass miniature X-ray units for case-finding was not found feasible. In the NTP the methodology recommended for case-finding was examination of sputum of patients reporting with chest symptoms at the institutions of general health services. This procedure, though simple, economical and applicable all over the country was found practicable and technically sound.

TREATMENT (CASE-HOLDING)

The main aim of case-finding is to treat patients, alleviate their suffering and to put down the transmission of infection. The priority in the NTP had to be given to finding and treating sputum positive patients, since they constituted the immediate public health problem. The sputum negative patients, however, seeking relief under pressure of symptons have not been denied the benefit of diagnosis and curetive services.

The pre-requisites of an efficient domiciliary treatment service were found to be regular supply of drugs as near to patients homes as possible and proper guidance there with regard to prolonged and regular treatment. Efficacious regimens free from side effects and free availability of drugs were some other crucial factors for enduring regular treatment and its completion. Due care was taken for meeting these requirements.

An operational study (13) on case-finding was conducted by the NTI. The patients residing in villages were divided into four groups, each group consisting of residents of adjacent villages. The drugs for one group of patients were stored at the area health centres. To start with, the patients were taken to the health centre where they were introduced to the Medical Officer, given detailed instructions to continue regular treatment for one year, given a fortnight's drug supply and were advised to collect drugs regularly every 15 days for one full year. In another area the drugs were stocked with the village Panchayat members. After motivation, the patients were advised to collect drugs from the Panchayat members fortnightly. For

through the village level workers, during the course of their regular fortnightly visits to the villages. To the fourth group, the drugs were distributed, through a specially appointed health visitor, in the patients homes fortnightly. The regularity of drug intake through all the four channels was similar: hardly 30% to 40% of patients took the drugs. This was so even in the case where the pills were distributed at the doors of the patients by the special staff. The efficiency of the primary health centre with regard to treatment regularity being similar to the services provided by specialised tuberculosis agencies, it was concluded that the primary health centres are as well acceptable as centres for tuberculosis services. In the NTP, therefore, the general institutions were activated, drugs were stored and the treatment was decentralisedto be given on ambulatory domiciliary basis. Drugs, mostly for self-administration, were supplied free of charge near the patients home.

INTEGRATION

Specialised services were found impracticable as these would consume substantial proportion of resources, depriving development of essential health programmes and social services of their share. Further, taking into account the secular trend of tuberculosis in the country, the NTP has to continue for years to come, the diagnostic services (sputum microscopy) simplified and curative service standardised for their easy applicability all over the country. These besides being simple, were within the technical competence of general practitioners. The programme, in order to meet the above requirement was conceived as an integral part of overall development of general services instead of functioning in isolation as a specialised vertical programme for control of tuberculosis alone.

BCG VACCINATION (PREVENTATION)

Prior to formulation of NTP BCG vaccination in India was started in 1951 as a mass campaign with the help of special BCG teams. These teams were mobilised from area to area to set up temporary centres at a central place in every locality. Those who attended the centre were offered tuberculin test at first attendence. BCG vaccination were given to tuberculin non-reactors at second visits, after 72 hours. Only those who attended the centres for reading of the test at second visit could be given BCG. BCG vaccination coverage by thisprocedure was inadequate. Subsequently, the BCG vaccination programme was integrated with the curative services of the district tuberculosis programme as a part of the comprehensive tuberculosis control programme. House to house vaccination (14) was recommended at first. Later, in 1964, direct BCG vaccination without tuberculin testing (15) restricted to the age group of 0-19 years only was advised. These modifications improved coverages as well as output and brought down the cost of BCG vaccination programme, due to abandoning of pre-vaccination tuberculin test. Further modifications in BCG vaccination programme recommended were simultaneous smallpox and BCG vaccination (16) of the new-borns in the cities and that of the school age children in schools. All these aimed at maintaining high BCG vaccination coverage. Since 1977, BCG vaccination has been made an integral part of the expanded programme of immunization, to be delivered by the staff of

General health services through multipurpose health workers all over the country, aiming at vaccination of all new-borns in the first year of their life.

THE DISTRICT TUBERCULOSIS PROGRAMME (DTP)

A permanent NTP having these features and a country-wide coverage of which the DTP (17) and (18) was the unit, was conveived and evolved in 1962 by the NTI. The objective of the programme was systematic reduction of tuberculosis through finding maximum number of sputum positive patients (probably more than the yearly incidence), converting them through effective treatment, as well as prevention of large proportion of the susceptibles through BCG vaccination.

Briefly, the principles (19) underlying the DTP were (a) sociological meeting "felt-need" of "action taken" patients: provision of permanent service as near to patients' residence as possible through integration with institutions of general health services (b) epidemiological: halting transmission of infection by finding and treating direct smear sputum positive patients to be followed by culture and abacillory tuberculosis patients, (c) administrative: the resource inputs to be in consonants with operational output and programme efficiency, (d) operational, to stay within the outlines laid for the programme allowing modifications for local sociological, administrative and operational variations.

ORGANISATION OF THE DTP

The two main components of the DTP which is a unit of the NTP are (i) the district tuberculosis centre and (ii) the peripheral centres.

(i) DISTRICT TUBERCULOSIS CENTRE (DTC)

The erstwhile tuberculosis clinics at district head-quarters were recommended to be upgraded to DTC. Such upgraded centres besides continuing their earlier activities of providing diagnostic and curative services, have been entrusted with the additional responsibility of planning, implementation and supervision of tuberculosis programme throughout the district. The senior medical officer (TB Specialise), the X-ray technician, a laboratory technician, a health visitor, a statistical assistant and the BCG team leader of each TB clinic are given in-service job-oriented training at the NTI so that they may organise and supervise the DTP in their respective districts. In the wider context of responsibilities the upgraded TB clinics have been provided additional facilities like transport, additional drugs, record forms and other necessary items of equipment and supply. The trained teams are responsible for visiting the peripharal health institutions to guide the staff of general health services in the diagnostic, curative and preventive work relating to tuberculosis. They have to supervise the institutions for the general health services regularly to ensure satisfactory techniques of case-finding, diagnosis, treatment, recording and reporting. The district centre provides necessary items of supply like drugs, stains, record forms etc.

(ii) PERIPHERAL HEALTH CENTRES

All the institutions run by the general health services of a district participate in the DTP and are designated as 'Peripheral health Centres'. Those offering X-ray [illegible]

the ones *done* only sputums smear microscopy is possible have been entrusted with respoisibility of sputum examination and are designated as 'microscopy centres'. Others were neither X-ray nor microscopes are available, are entrusted with the responsibility of collecting sputa from symptomatic patients of preparing smears and sending them to the nearby institutions having microscopes for smear examination: such institutions have been designated as 'Referral centres'. These centres are advised to send patients to the nearest X-ray centre if their sputa are negative or they are unable to produce sputum. All the above 3 categories of peripheral centres treat the patients on ambulatory domiciliary basis. The drugs for their treatment are supplied by the District Tuberculosis Centre.

The District Tuberculosis Officer and his team have been made responsible for training, co-ordination of work, arranging supply, supervision and compilation of the reports in respect of the working of the tuberculosis programme in the entire district.

Posting of specialised staff at the peripheral centre for antituberculosis work has so far not beenr ecommended as the estimated additional expenditure on special staff did not appear to be commensurate with the quantum of work load.

REVIEW OF NATIONAL TUBERCULOSIS PROGRAMME

The regular reports on the performance of DTP, compiled quarterly by the Director General of Health Services, at the national level reveal that the achievement regarding case-finding and case-holding aspects are about 30% of the expectations.

A review of the NTP was undertaken by the ICMR Expert Committee in 1976. The Committee highlighted some inadequacies regarding operational aspects, the almost complete absence of supervision by the staff of DTC, the District and State health administration, the inadequacy of posting of staff and supplies. Lack of interest in the programme at all levels was also reported. Some corrective actions were also suggested, the results of which still remain to be seen.

INVOLVEMENT OF COMMUNITY HEALTH GUIDES AND THE MULTI-PURPOSE WORKERS

In order to bridge the gap between expectations and achievement attempts are now been made to avail of the services of the newly set up infra-structure of multi-purpose health workers and community health guides under the "Primary Health Care" programme of the country.

Tuberculosis case-finding which was of a somewhat passive nature earlier can now be carried out more actively with the involvement of multi-purpose health workers. During their routine beat in villages for health activities they can question the population for presence of chest symptoms and identify those who have cough of two weeks or more duration. They can collect sputum specimens from such persons, make smears and send these to the Primary Health Centre for microscopy. This strategy will augment tuberculosis case detection considerably. A recently conducted study (20) from NTI has shown that multi-purpose health workers can perform this function along with their other duties during their routine visits to the households. Although in the

first three months or so the work load would be substantial, after the completion of the initial one or two rounds of intensive case-finding, the workload during subsequent visits will become manageable involving, on an average, 2-3 smears per week per multi-purpose health worker. By this method the case detection will be augmented considerably.

The multipurpose workers can also be trained for case-holding. During the routine visits to their areas they can supervise and guide thepatients about treatment regularity, retrieve the defaulters and motivate them to continue treatment regularly. It is expected that their involvement in the programme will definitely improve the regularity and completion of treatment.

Multi-purpose workers under the expanded programme of immunization are entrusted with the responsibility for BCGvaccination along with other vaccinations. All infants between 3 to 9 months of age will be vaccinated by them in the villages once in a year.

The programme performance and potential studies (21) have shown that the OPD of the general health institutions is capable discovering in one year 46% of the entire pool of infections cases in the district, about one and a half times the annual incidence i.e. 65% of the sputum smear positive cases. As regards the case-holding potential of infections patients, 63% become sputum negative, 20% continue to remain positive at the end of one year of treatment and 10% LTF. The actual performance fell considerably short of the potential, specially in respect of case-finding.

The objectives, principles potential and performances of the NTP make it an optimum programme. Although primarily a Government programme it needs active co-operation and assistance of the voluntary organisations, private health institutions and private medical practitioners. Only then can it hope to achieve its objectives speedily and effectively.