the right pattern. Again, 15 percent of the un-implemented districts are in one state and means could be found to give special care to this state to solve its problems.

Even in the implemented districts, on an average, one third of the PHIs have not been involved in DTP, for one reason or another. This implies that only two thirds of the population has in reality been offered the services. If so, how can we establish expectations on the basis that the entire population has access to the services. And then feel dissatisfied that the expectations have not been fulfilled?

Management wise there are some more disquieting factors. The annual targets are being met only to the extent of fifty per cent; supervision over PHIs by DTO and his team is also being exercised to that extent, only about 25% of DTPs have fully trained teams posted and quite a few team members are untrained, implying that trained teams posted and quite a few team members are untrained, implying that supervision exercised by them could not be very effective.

Unless and until the constraints are addressed diligently, the noted progress will fail to satisfy most. It is the right time to improve management in particular and operations in general and the progress could even be spectacular.

IUATLD PRIZES

The International Union Against Tuberculosis and Lung Diseases (IUATLD) will award four prizes of US $ 5000 each to two young scientists or physicians working in the field of tuberculosis and the other two awards will be for scientists or physicians whose work relates to non-tuberculous respiratory diseases. For both fields, prizes will acknowledge efforts in developing and developed countries. Applicants should have distinguished record in research, teaching or in carrying out public health programmes directed at preventing or treating tuberculosis or other lung diseases. Only persons under 45 years of age of the end of 1989 are eligible.

Application in English, French or Spanish including curriculum vitae and mentioning age, attainments and important publications (with copies thereof) should reach the IUATLD Secretariat (68 Boulevard Saint Michel, Paris 75006) directly or through the Tuberculosis Association of India (3, Red Cross Road, New Delhi-110 001) before 31.12.89.

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INDIA'S NATIONAL TUBERCULOSIS PROGRAMME -- AN OVERVIEW

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Summary : The overview takes into consideration the historical, socio-economic, administrative, and technical factors which have played a prominent role in shaping India's National Tuberculosis Programme. It comprises an analysis of the current status, trend during the past ten years and discussion of some aspects that need further attention. Now, a majority of the constraints are administrative and not even operational, while the needed technical improvements are few. At the present stage of development, it would appear premature to say if the programme has succeeded or failed.

Introduction

An overview of National Tuberculosis Programme (NTP) is not a simple matter because many politico-administrative, socio-economic, operational and technical factors have impinged upon it as well as interacted in various ways and at different times. some factors are, in fact, part of the wider national ethos, controlled by forces beyond technocrats. Any facile opinion about success or failure of NTP at this stage of development can, therefore, be correct to an extent but cannot be the entire truth.

Historically, attempts to deal with tuberculosis in the country began sometime after the turn of the present century. Led by voluntary effort, these attempts had perforce to be sporadic and limited in nature and comprised mostly of sanatoria in the hills. Around the time India gained political independence, the well known Bhore Committee Report was published, ushering in the era of planned health programmes. Justifiably, NTP could be deemed to have been born then. Besides, the value of domiciliary treatment having been established, it was possible to plan a broad-based programme to deal with tuberculosis.

At that time, NTP comprised five more or less independent but planned schemes viz. (*i*) BCG vaccination of the susceptible population. (*ii*) establishing clinics for diagnosis and treatment of tuberculosis patients (*iii*) increasing beds in tuberculosis sanatoria and hospitals. (*iv*) colonies and vocational centres for rehabilitation of tuberculosis patients and (*v*) research, roughly in that priority order. The planning, half a century back, was based on the best technical knowledge and population. Thus, the country was to have at least one bed for each tuberculosis annual death, one clinic for 100,000 population, and so on. For understandable reasons, plan progress remained confined to urban areas. Then the National Tuberculosis Prevalence Survey, 1955-1958, jolted every one by demonstrating that the tuberculosis problem in India is in reality rural, on account of the predominantly rural population.

The decade following freedom also brought into relief socio-economic inadequacies of NTP, in the Indian context, despite the logic and use of similar approach in other countries. Search for a better model for NTP began around 1955. The then Tuberculosis Chemotherapy Centre, Madras and National Tuberculosis Institute (NTI), Bangalore, established to find indigenous solutions to the local problems, soon succeeded in showing a new way. This more appropriate technology was found suitable not only for India but other developing countries as well. The new technology took into consideration the felt needs of the people, scarcity of resources, social customs and prejudices, as well as polity, in addition to moulding application of scientific knowledge to the field conditions. NTI demonstrated feasibility and practical applicability, and even established the potentials for case-finding and case-holding, before Government adopted the new basis of NTP in 1962.

Since 1962, district-the socio-political unit-is made the operational unit of NTP. Techno-managerial leadership of district tuberculosis programme (DTP) rests with a five member managerial team (Medical Officer, Treatment

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Organizer, Laboratory Technician, X-ray Technician and Statistical Assistant) posted at the TB clinic, redesignated as district tuberculosis centre (DTC). Managerial training, of a uniform standard, to DTC teams is given by NTI. Programme activities are standardised and made available in the form of manuals by NTI. It is the responsibility of DTO & his team in DTC, to involve all peripheral health institutions (PHI) in the district, in offering DTP services to the people, either as microscopy or as referring centres; give in-service training to PHI staff and supervise their working, for NTP. Besides, there is provision for State and Central level programme monitoring, and supervision of the performance of DTP, from State level, and of State programmes from the Centre., Within the above fairly comprehensive structuring, there is scope for flexibility to suit local conditions, as long as basic principles are observed. This is necessary because under the constitution, Health is a State subject and all responsibility for programme implementation and evaluation rests with states. An agreed quantum of central assistance (which includes international aid) flows to state governments and provides the modicum of uniformity on a countrywide basis. NTI has been monitoring NTP quarterly since 1978. This presentation, therefore, is based on those periodic reviews, a recent in-depth study done by an independent voluntary agency and the experience of those associated with NTP since its birth.

Extension of National Tuberculosis Programme

In the nineteen fifties, the approximately 400 million people were spread in roughly 300 districts. Average district population then was 1.5 million - 80% rural - and number of PHIs around 50, besides the DTC. Since then, the population has grown to over 800 million. And due to socio-political reasons, the number of districts has gone up to 437; average district population to 1.8 million and average number of PHIs to 60, with improvement in the health infrastructure.

By 1988 end, out of 437 districts, only 371 (85%) had DTP. But at no time since 1962 has the proportion of implemented districts crossed the 85% level, nor has the proportion been improving for many years. Analysis of the 66 non-implemented districts in 16 states/union territories reveals a mixed bag of reasons, largely of administrative nature.

Likely reason/ State	Non-Implemented Districts	Total Districts
Sparse population		
Arunachal Pradesh	5	10
Assam	6	17
Himachal Pradesh	3	12
Jammu & Kashmir	5	14
Manipur	6	8
Meghalaya	3	5
Mizoram	1	3
Nagaland	5	7
Sikkim	3	4
Union territories	8	12
9 States/UTs	45 (49%)	92
Administrative Reasons		
Bihar	10 (26 %)	38
Recent Bifurcation of District		
Haryana	1	12
Kerala	4	14
Maharashtra	3	30
Punjab	1	12
Rajasthan	1	27
U.P	1	57
6 States	11 (7%)	152

District populations being unequal, non-implementation of 15% of the districts does not mean that much population has no DTP cover, nor that population in the newly carved districts is denied access to the established DTP services. Nonetheless, why should a proportion of the population not have access to services near their homes. so long after the introduction of DTP in the country? And, for that matter, how many PHIs in the implemented districts are not participating in DTP?

In the 371 implemented districts at the end of 1988, around 14,000 PHIs were participating *i.e.* on an average 38 out of the estimated 60 PHIs in each district (63%). It appears that for administrative/operational convenience, mostly those PHIs that are in the semi-urban and more populated rural pockets have been implemented, reminiscent of a similar practice for the entire country. In other words, the entire population has not yet been covered by DTPs.

Attempting a more precise estimate of the population proportion having access to DTP services may not be rewarding because, in reality, the population in a five km radius zone of influence around each health institution have good access; besides, the people in the zone of influence utilize the facilities to different extent. The incomplete coverage and varying utilization of DTP services are very important to a discussion of expectations from NTP performance.

Performance

Routine quarterly programme reports are the source of information for a review of activity performance. But, around 85% of DTP reports are received on time and contain information for around 70% of the participating PHIs, in addition to that of DTC. A very small number of delayed reports get included in the next analysis of performance. Since the non-reporting DTPs are not the same every quarter, one could project the reported performance by pro-rata addition of the performance of non-reporting DTP to estimate the overall NTP performance (Table 1).

The quarterly programme reports show a wide variability in performance : the fluctuations observed in the performance of individual DTPs probably represent the varying inputs of good and not so good workers; in respect of states, some perform consistently well while others do not improve at all, suggesting the influence of local administration and work culture. Under the circumstances, calculation of average DTP performance *i.e.* total performance divided by the number of reporting DTPs should do for making comparisons and analysis of trends.

Case-Finding

During 1988, an average DTP discovered 4,015 new tuberculosis patients, 322 (8%) of whom were extra-pulmonary. Of the 3,693 cases of pulmonary tuberculosis, 783 (21%) were sputum positive of whom 385 were discovered by DTC and 398 (51%) by around 40 PHIs.

Table 1 shows case-finding performance, as reported as well as calculated for non-reporting, according to type of case from 1978 to 1987.

Table 1. *Case-finding in thousands--reported and calculated for non reporting-- according to type of case under NTP, 1978-1987*

Reported	Years									
	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Sputum positives	128	138	128	130	176	210	212	223	227	227
Suspect cases	322	366	348	358	514	612	616	685	730	811
Extra-pulmonary	41	43	41	40	43	57	62	66	77	90
Total	491	547	517	528	733	879	890	974	1034	1128
Calculated										
Sputum positives	188	185	174	189	219	256	262	259	381	286
Suspect cases	473	508	474	521	638	747	764	798	904	1000
Extra-pulmonary	61	58	56	58	66	69	77	76	95	114
Total	722	751	704	768	923	1072	1103	1133	1380	1400

There is a steady increase in case-finding during the last decade, more pronounced from 1982 onwards because in 1981 NTP was included in the 20-Point programme of the government and about that time multi-purpose health workers at the grass roots were involved in case-finding. Since there is no basic difference between the reported and calculated case-finding, one could say that around 1.5 million cases are now being discovered annually of whom one fifth are sputum positive.

The overall case-finding under NTP shown in Table 1 should be influenced by population increase as well as increase in the number of participating DTPs. Table 2 shows the total cases found per 100,000 population as well as number of sputum examinations done and sputum positive cases found in an average DTP to obviate the influence of the two factors. Table 2 not only underlines the findings of Table 1 but shows that the gain in case-finding has been obvious.

In 1978 two operational changes were introduced in the case-finding technology; targets were introduced for the number of sputa to be examined every year and multipurpose workers were to collect sputa from symptomatics during their home visits. It should be useful to examine their effect on the quality of sputum examination. Also, if the change influenced the relative contribution to case finding made by PHIs, where multipurpose workers operate.

Table 3 gives the number of sputa examined in an average DTP and the contribution, respectively, from DTP as well as PHIs, along with the related sputum positivity rates, from 1978 to 1988. Till 1981, around four and half thousand sputa were examined every year, with positivity rate of 13 percent, in an average DTP; of these two thousand eight hundred came from DTP and seventeen hundred from PHIs, with positivity rate slightly lower in PHIs. A dramatic change has occurred after 1981. The number of sputum examinations has risen very sharply; there is very little change in DTP performance, from year to year, but PHIs are examining more sputa every year, with a steadily declining positivity rate. It does appear that a steady plateau of 5% positivity rate has been reached in respect of PHIs too, and there may be no further decline. The significance of the decline in positivity rate is discussed later.

As mentioned in the introduction, PHIs hold an important position in DTP because they cater to 80% of the population. With a declining positivity rate, doubts may arise as to the real role of PHIs. Table 4 examines this point : the per cent contribution of PHIs in respect of total sputa examined, sputum positive cases found and total case-finding of an average DTP, from 1978-1988. It is indeed satisfying that during the last ten years, the PHIs share in sputa examined has risen from 36% to 72%, in sputum positive cases from 31% to 51% and in total case-finding from 30% to 47%.

Table 2. *Total cases found per 100,000 population and in average DTP (1978 to 1988)*

Year	Case - Finding: AVERAGE DTP: Sputum Exams	Case - Finding: AVERAGE DTP: Sputum Positives	Total Cases per 100,000
1978	4,434	603	29
1979	4,685	586	28
1980	4,531	546	26
1981	4,493	536	28
1982	5,585	620	31
1983	7,495	725	36
1984	9,140	735	36
1985	9,951	735	36
1986	10,476	769	37
1987	11,542	772	37
1988	11,848	783	38

Table 3. *Number of sputa examined annually and percent positivity rate in average DTP, DTC and PHIs from 1978 to 1988*

Year	Number of sputa examined: DTP	%	DTC	%	PHIs	%	Percent Possibility: DTP	DTC	PHIs
1978	4434	100	2859	64	1574	36	14	15	12
1979	4685	100	2971	63	1714	37	13	13	11
1980	4531	100	2830	62	1701	38	12	13	11
1981	4493	100	2687	60	1806	40	10	10	10
1982	5585	100	2895	52	2690	48	11	13	9
1983	7495	100	2908	39	4587	61	10	14	7
1984	9140	100	2913	32	6227	68	8	13	6
1985	9951	100	3013	30	6938	70	7	12	5
1986	10476	100	3098	29	7378	71	7	13	5
1987	11542	100	3227	28	8315	72	7	12	5
1988	11848	100	3359	28	8489	72	7	12	5

Table 4. *Percent contribution from PHIs in respect of sputa examined and sputum positive as well as total cases found annually in an average district from 1978 to 1988*

Year	Per cent contribution from PHIs in respect of: Sputa examined	Sputum positive cases	Total cases
1978	36	31	30
1979	37	34	32
1980	38	34	33
1981	40	35	33
1982	48	40	37
1983	61	45	43
1984	68	48	44
1985	70	50	44
1986	70	49	43
1987	72	50	46
1988	72	51	47

Treatment and Case Holding

Information on these aspects is comparatively incomplete. During 1988, on an average 4,700 tuberculosis patients per DTP were put on treatment. Of the 4,000 newly discovered cases during the year, around 5% did not start treatment (initial default), while 25% got added on account of 'transfers in' and 'restarted treatment'. Only about 30% of DTPs reported cohort analysis, according to which only 27% had completed twelve monthly drug collections or more. Default in drug collections is frequent-more in urban areas-and taking of defaulter actions infrequent. Sputum examination at the end of treatment completion is infrequent too, making any observation on sputum conversion unrealistic.

Since no appreciable improvement in treatment completion occurred after 1981, and the potential for treatment completion with standard regimens, in an NTI operational study, was no better than 45%, it was decided, in 1985, to try out six-month short course chemotherapy, despite some doubts regarding the capability of present day DTP case-holding. Eighteen DTPs in the South were placed under supervision of the Tuberculosis Research Centre, Madras for this purpose. Treatment completion, on an average, has improved to 52% with the six-month drug regimens. And, another group of 176 DTPs have been assigned to NTI to see if short course chemotherapy will give similar results under the routine supervision of DTC teams. Since treatment compliance with the standard drug regimens, at the sixth month of therapy, is also around 50% to 60%, it is believed that case-holding and treatment completion can be improved to around sixty percent level, under

NTP, by switching over completely to short course chemotherapy.

Management

The management aspect of NTP does not look as rosy as the activities discussed above. The incomplete extension & coverage of population by NTP has been described. Training management, of DTC teams is another similar example. Since 1962, over 4,800 team personnel or roughly 900 full teams have been trained by NTI. But in 1988, only one fourth of the 371 implemented districts had trained full teams in their DTCs, while 70% DTPs had the services of a trained DTO (team leader). This position is much beyond the usual attrition rate and suggests a casual attitude towards managerial training and posting of full teams for proper management. Some administrators even question the role of managerial teams for DTPs when the programme is running 'smoothly' despite incomplete teams and some team members being untrained.

Many DTP reports have the column of supervisory visits paid to PHIs left blank. Rest of the reports show that only 40 to 50 per cent of the scheduled visits are made. It is a common observation that the more conveniently located PHIs are visited repeatedly and some not visited at all; also, that more frequently the supervision is half-hearted. No wonder that one third of the PHIs on an average are left un-implemented. As regards supervision from the Central level, only six per cent of the scheduled visits to the States were paid in 1988 and supervision exercised by the States over their DTPs was no better. Central monitoring of NTP is excellent but monitoring at the State level, and corrective actions following monitoring as well as supervision, leave much to be desired.

Every year modest targets are set for sputum examinations but these targets are being met to no more than 50%. Still, case-finding under NTP has improved satisfactorily. It stands to reasons that if management were better and supervision more effective, achievement of targets would be far better, case-finding superior in numbers and proportion of sputum positive cases, and case-holding able to reach the promise of chemotherapy.

Equipment is in working order in 90% of DTPs; supervisory vehicles in 60% of DTPs; budgets - especially for travel - are inadequate in most DTPs and the supply of drugs--not so much the stock of drugs as their distribution and quality--and other expendables leaves much to be desired.

Discussion

Twenty five years after the adoption of DTP, the NTP presents a picture of encouraging progress and frustrating constraints.

Since 1978, when central monitoring of NTP began, the number of DTPs has gone up from 313 to 371; the average number of sputum examinations per DTP in a year has increased to nearly three times; x-ray examinations by one and a half times; total new cases found are now twice in number and sputum positive cases one and a half times (from 0.2 to 0.3 million every year); and contribution of PHIs in case-finding has increased from 30% to 47%. Now , 1.5 million new cases are found every year of which around 8% are extra-pulmonary, 72% suspect cases and 20% sputum positives. Treatment completion has improved from about 30% with standard drug regimens to 55% with short course chemotherapy. This progress may not be spectacular but is surely notable.

Management wise, the coverage of population with DTP services has, perhaps, not gone beyond 60%; the annual sputum examination targets are being met to the extent of 50%; only 25% of DTCs have full trained teams posted; supervision over PHIs does not exceed 50% of scheduled visits, and so on. Nevertheless, this state of affairs is not confined to NTP alone : barring a few exceptions, it is part of the national scene and reflective of a society in flux.

Besides inadequate management, some of the basic concepts underlying DTP, and the attitudes that go with them, have not yet completed their full evolution. There appears to be a stalemate in respect of integration. Despite a much wider acceptance of the idea than before, there is insufficient structuring, devolution of responsibility and powers, and budgeting procedures to let integration play its role fully and bring in the envisaged benefits. In some states, and in selected areas in other states, it could be that integration introduced in the sixties has begun to disintegrate, creating confusion and making the services more vulnerable. Similar confusion prevails regarding the purpose and role of multipurpose workers at the grass roots. The same could be said regarding the concept of voluntary and private sector collaboration and co-ordination with the DTP services in the district. Considerable efforts have been made in enlisting their co-operation by arranging for the staff of these two sectors, seminars and workshops, supply of drugs for free distribution for their patients, offer of diagnostic services in respect of problem cases and even home visiting to retrieve the defaulters. The progress, however, has been disappointingly small and slow. Attitudinally, these three sectors see their role in competition rather than extending complementary and supplementary assistance to each other for the same beneficiaries.

Operationally, the referral system vital to integrated functioning is almost non-functional. Studies are needed urgently to understand the reasons. Another operational aspect needing urgent study is the phenomenon of falling sputum positivity rate. When the operational base for selection for sputum examination is widened, a certain fall in positivity rate can be expected. What is disquieting is the large gap in the fall between DTC and PHIs, which is understandable to an extent, but needs investigation to make sure. It would be premature to conclude that there has been a fall in the quality of sputum examination, or similar other assumptions.

An operational factor of great importance is the formulation of expectations based on the early NTI studies on the potential of case-finding and case-holding under DTP. The gap between expectations and actual performance is large enough to cause dissatisfaction. On the one hand these comparisons have helped in focussing attention on certain aspects of performance leading to improvement in case-finding as such, and the relative contribution from PHIs, on the other hand a closer examination of around 30% to 40% achievement of the expectations has suggested an element of unreality in the earlier potential studies. True, those studies were carried out under DTP field conditions, strictly according to programme manuals. But the study staff belonged to NTI. That staff had motivations and work ethos quite different from the attitudes and application to work found among general health services staff. The potential studies served a very useful purpose by establishing credentials of DTP at that point of time. If we have to use those results for the formulation of expectations, then we must repeat the studies in exactly the same manner but use average general health staff for carrying out the activities under the overall surveillance of NTI staff. Even otherwise, there is need to repeat some operational studies under the present day changed conditions.

Technically, there are hardly any major problems. Perhaps, two points could be looked into by NTI. One relates to the reason why sputum positive cases, among the symptomatics, continue to remain around 20% while the suspect cases constitute the bulk *i.e.*, 72% of the total new cases found. It is likely that following integration, there has been a fall in the quality of x-ray reading : Steps may have to be suggested to control the extent of over-reading, if any. The second point is to carry out field trials of a suitably modified model of DTP which is applicable to the remote hilly districts with sparse population. This should help to speed up the implementation of those districts which have been left out of NTP for so long.

No references