

3. IN THE WAKE OF KNOWLEDGE



*James O'Rourke, WHO SMO
Term of Office : 1963-1965*

Spectacular ephemeral results are less useful than sound structure and growth. But even this clear, practicable aim demands attention to a myriad details. Supplies must flow regularly, equipment has to be maintained: supervision must be augmented by assessment, feeding back into research...NTI cannot subsist on enthusiasm alone. Possessed by our cause, we must still grasp all its implications.

*James O'Rourke
SMO, WHO
WHO I Quarterly Report 1964*

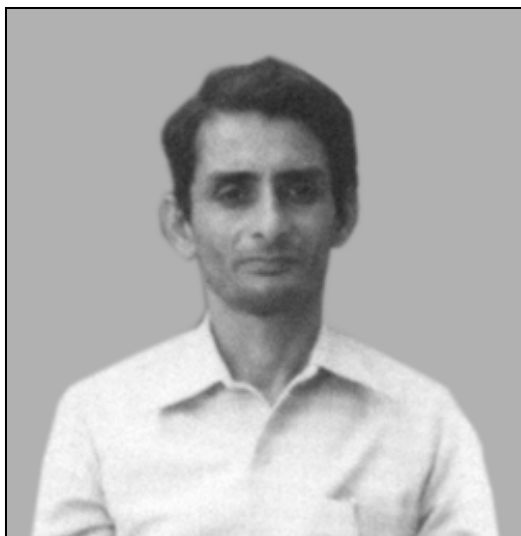
3.1. Challenges during the early period

Knowledge, it is believed, is power. Realistically, what use is knowledge without action? The knowledge the NTI generated was operational. The NTP sought to use it for reducing suffering from TB. Past experience revealed that it is more difficult to change the attitudes and practices of the so called knowledgeable than the naive. The former have something to “protect”, therefore, they question more. The latter have nothing to lose. If they are persuaded that something tangible can be gained, they might become willing participants in the change.

If the NTP took roots and developed as planned, the accruing benefits would steadily decrease the burden of TB. This would be truly a monumental achievement with far reaching implications. However, this robust pragmatism had a catch. The burden of pushing the NTP was placed on a few officers located in Delhi or Bangalore. As Dr James O'Rourke who had joined as Senior Medical Officer (SMO), WHO said:

Apart from the considerable experience that it has acquired already in research on operational matters, the NTI is proud also of its awareness that control of TB is like control of other diseases. It requires not a specialised, isolated structure, but an integrated health service. Both for operational enquiries and for the development of the programmes the Institute has the advantage of habitually focussing on one subject whilst being deeply concerned with overall picture⁴⁵.

Obviously, the first job was training of the key personnel running the NTP - health administrators, doctors and other TB workers. Even the highly motivated work force of the NTI found it an uphill task to expose the 'knowledgeable'. The year following the acceptance of NTP, the work of the NTI increased. It had to energise the various state governments : (i) to send key medical and para medical workers for training; (ii) to select districts to function as DTCs; (iii) to train the key personnel managing it; (iv) to interact with the newly implemented DTCs in problem solving exercises; (v) to interact with GOI, UNICEF and WHO in



*Mr. AN Shashidhara
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Chronicler of the "Annals of NTI"*

securing the despatch of equipment and such supplies like: (a) X-ray machines, (b) films, (c) microscopes, and (d) laboratory reagents, which were not yet available in India; (vi) to interact with the concerned agencies for uninterrupted drug supplies etc. This work became a necessary addition to the NTI's primary role in conducting training courses, assessing the performance, and conducting operations research to improve programme efficiency.



*Miss. MA Seetha
Former Asst. Training officer*

In 1963, there were several important administrative changes. Dr DR Nagpaul took over as the Director and Dr Raj Narain resumed his functions as epidemiologist. Mr Stig Andersen, who along with Dr D Banerji had done path breaking work in sociology, went to Manila on a different assignment and Dr James O'Rourke took over from him as SMO. All these men were unsparing in their efforts in pushing NTP, while at the same time recognising the difficulties involved in its working. During the same period, Dr P Chandrasekhar, Dr Pyarelal, Mr VA Menon, X-ray

Engineer, Mr L. P. Subramanian, AO, Ms. MA Seetha, also joined. Ms Seetha worked in various capacities and retired as assistant training officer and was very well-known among trainees.

3.1.1. Issues pertaining to training

For the sixth training course, 85 trainees had arrived from 14 states⁴⁶. The collaborative relationship with the LWSTC was strengthened. There were 1300 patients in its various urban sub-centres and the records and registers were standardised. Officers and staff were active in running all facets of the programme

including training. In a year's time, it was hoped that this centre would provide NTI with its first information on the methodology of rendering technical assistance to other district centres and their evaluation. To this end, there had been active support from the state government, DHS and the Superintendent of the LWSTC. The NTI faculty made regular visits. Trainees were taken there on scheduled trips. Often, collaborative studies were taken up. All these helped to maintain the encouraging work atmosphere.

Amidst these activities, the NTI initiated action in improving the content and methodology of



*Lady Willingdon State Tuberculosis Centre, Bangalore
Dr. Susai Mary, Med. Superintendent (Inset)*

training. The duration of training was reduced from four months to thirteen weeks and was conducted thrice a year. The faculty began to take keen interest in learning by observing successive batches of trainees. Refinement of methodology became a continuous process in which training itself provided the vital feed back. A major deterrent noticed was the language barrier especially among the para medical staff. They had genuine difficulties in accessing information. Firstly, the language of training was English. Since trainees came from different states, English alone or even Hindi, if introduced, would not suffice. The NTI faculty could not be conversant in 19 major languages and hundreds of dialects. Secondly, despite didactic lectures and field demonstrations, there were missing links. The NTP was a system oriented programme in which different constituent activities were interlinked to the envisaged objectives. The basic training philosophy, therefore laid emphasis on the “team concept”, rather than the individual. There were always some trainees who

would not or could not absorb this concept or develop the knowledge and attitudes required in certain areas. To partially solve this problem and enhance the learning process, a Dummy Programme was started in 1965. Dr Nagpaul himself took an active part, in leading the faculty. His very presence energised everyone. The atmosphere was informal. Lengthy debates were encouraged. So enthused was Dr D Savic, he wrote: *1966 could indeed be described as the year of training⁴⁷*.

All these innovations had been steadily gaining international attention. Trainees from other Asian countries arrived. Dr Nagpaul was invited to Singapore to give a series of lectures related to NTP at the International Regional Course on Epidemiology organised by WHO/SEARO. Cooperation was established with the International TB Control Centre, Prague. The Indian Chapter of the International Course in Epidemiology and Control of TB (Prague Course) was inaugurated at the NTI on 16.8.1967 by Sri K

Puttaswamy, Honourable Minister for Health, Mysore State. The Indian Chapter was a continuation course after Prague. The four week premier course was attended by 15 fellows and four observers who came from 14 different countries of the world⁴⁸.

3.2. Knowledge as a source of growth

Despite all these developments, problems persisted. The administrative structure, procedures, supply lines, and service conditions of workers constituted the base of the iceberg of programme difficulties. Compared to these, technical problems paled into insignificance.

In 1967, in an important paper, on the District TB Control Programme in concept and outline, Dr Nagpaul elaborated the major constraints: *There may be many possible ways of tackling TB in our vast country. But with the resources we have and the disadvantages shackling us what else could we do but to approach the problem rationally and scientifically, carefully considering to use the*

*facilities that we have disturbing little of? The minimum intervention of the programme perhaps embodies a vital force in breaking the chain of transmission because it seeks to identify the sputum positive TB cases and treat them first on priority. All this requires systematic yet simple work to be done by the concerned and learned and not subjected to individual innovation however ingenious. These ingenuities must wait till this first necessary step is taken by everyone all over India*⁴⁹.

The realisation slowly grew that there were several obstacles to the smooth flow of knowledge. The authorities who run the state and those who influence the flow of medical information may not have understood the NTP and the immense benefits it would render. After great deal of deliberations, a proposal to invite the DHS of states to acquaint them of the NTP methodology was deemed necessary. For specialists, a reorientation and briefing course was also instituted which attracted eminent personalities from India and abroad. A proposal was mooted to offer special courses to

epidemiologists, bacteriologists, PHNs, statisticians and senior technicians. Ten day seminars were arranged for senior health administrators, professors of medical colleges and the other key persons to focus on the NTP. Guest lectures by eminent doctors, like Frimodt Moller, KL Hitze, K Toman, NL Bordia and others, were arranged to increase the involvement. Soon these courses became very popular and were well attended. The benefit of such courses was not measured. Yet, they did produce a positive influence on the programme as is evident from a letter from Dr TB Master, Prof. and HOD of TB and Chest Diseases, Grant Medical College, Mumbai: *"I have been very impressed by the work being carried out, particularly from the point of research, in the very vast field of epidemiology. The group of doctors working there are very sincere, conscientious and dedicated; some of them are also of international repute. It is sad to learn that advantage is not taken of the work at this Institute and also of the knowledge imparted by the workers there. The Seminar is a great success. Knowledge is propagated*

*to the delegates without any reservation. In conclusion, I do not hesitate to say that my thoughts and ideas have become clearer and wider. I wish more people working in the field at different levels attend such seminars and apply the knowledge gained in practice during their daily work"*⁵⁰.

3.3. Development of State TB Centre

The second aspect of energising the state governments proved to be much more daunting. The states had a number of things to provide on a regular basis such as infrastructure, DTP personnel, other supportive staff, equipment and drugs. The state itself should provide the vital leadership in implementing the NTP and keep it functioning efficiently. It should interact with the GOI and the NTI for the necessary support and technical guidance. Not only is India a big country, different states have different socio-economic settings. Local compulsions forced each state to develop its own administrative procedures. Differences in language and customs pose problems, which are

not easily overcome. There may be budgetary constraints in sending trainees to Bangalore for 13 weeks. In addition, every DTC required, sustained administrative and financial assistance. Their activities must be effectively supervised. It would therefore be better for the states to train its own staff to run its DTCs. These should evolve an effective supervision and evaluation system. There should be a superstructure at the state level to coordinate the working of different DTCs and monitor efficiency.

Hence, the NTI concentrated on developing strategies for preparing key officers, infrastructure and assessment staff to run a state centre. They would directly control their respective DTCs. Fortunately, the experience gained at the LWSTC, Bangalore proved valuable. The document *Functions and responsibilities of State TB Control Centres*, was prepared, revised on 28.1.67 at the NTI, in the presence of the Advisor in TB. It was submitted for final test on 2.2.67 at Hyderabad, one day before Annual TB Conference. The DHS

and STO of the state and representatives from DGHS were present. The document was slightly amended and it was presented to the government for circulation among the states⁵¹. From 1962, State TB Centres (STCs) were set up right across the country in Uttar Pradesh, Gujarat, Maharashtra, Madhya Pradesh, etc.

As the NTI was located in the adjoining state, Dr Nagpaul took keen interest in the development of STC for Andhra Pradesh at Hyderabad. He was assisted by other NTI faculty, Dr BC Arora who had recently joined NTI, Dr GD Gothi, Mr C Satyanarayana, SA and others. All the guidelines were given so that this new Hyderabad STC would function like NTI. The next on the line was Madras STC in Tamil Nadu. Meanwhile, a methodology of training was evolved. The first training course of three months for the STC personnel was started at NTI on 13th November 1972⁵². Drs GC Banerjee, AK Chakraborty and Mrs M Prakash joined the NTI. This strengthened the ongoing work.

Experience gained from these varied activities proved invaluable. Most manuals were revised from the actual work experience. By 1969, 345 MOs, 338 TOs, 331 LTs, 330 XTs and 275 SAs had been trained. By 1970, NTP had been expanded to 191 districts, to cover 57% of the country.

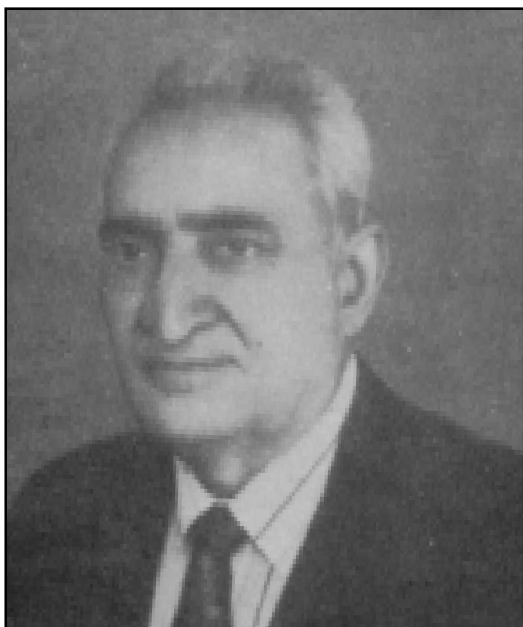
It was a satisfying decade for the NTI because much had been accomplished, both in improving the content and methodology of training and implementing the NTP. Yet the NTI did not bask in contentment. It had developed a robust philosophy. It could be summed thus: We often hear of the big difficulties faced by the NTPs. But, has anyone anywhere visualised a programme in which the implementers did not face any difficulty? Are other similar health, social or economic programmes devoid of difficulties? At least, we are lighting knowledge lamps of NTP at an increased pace.

3.4. Sustainability of the model

After the passage of time, the Hyderabad STC which was so

painstakingly initiated, did not continue to function as expected. The Madras STC also was not keen to train DTP key personnel. The situation nearer home in Karnataka, at the LWSTC, was not different. The laboratory facilities were not appropriate and there was no effective drug surveillance. Most of the STCs were not effective in training or supervision of DTCs under their jurisdiction due to lack of staff and other facilities. The qualified staff when retired or transferred were not replaced by suitable personnel. The NTI could enthuse them even less because of logistics and perseverance required for this task.

The TB Demonstration and Training Centre (later known as STC) at Agra, sets an example of how advocacy, commitment and highly motivated people can make a difference between success and failure of institutions. This centre was established in 1962 by the Uttar Pradesh government with the assistance of GOI, WHO, UNICEF with Dr ML Mehrotra as its Director. He overcame every obstacle to make the centre one of



*Dr. ML Mehrotra Director,
TB Demonstration & Training Center,
Agra*



STC, Agra

the best in the region. He ensured that his workforce consisted of qualified doctors with post-graduate (PG) degrees and qualified para medical staff, enriched with additional qualifications to specially enable them to participate in teaching, training and research work besides routine clinical work. It had competent statisticians. The centre possessed all facilities needed for TB work, including a well equipped library and laboratory that could take up culture and sensitivity work. Besides hostel for trainees, beds for TB patients, a dharmashala was also maintained to house relatives of in-patients during emergencies. In 1977, its status was raised to include other chest diseases. It also conducted training courses for PG students, nurses, HVs and technicians. Its 1979 report, lists WHO, UNICEF, United Nations Economic Social and Cultural Organisation (UNESCO), IUAT and other organisations as coordinating partners. It initiated new schemes which included elective training of foreign medical students. It is not difficult to understand that such an institution led by Dr Mehrotra acquired fame

and stature over years. Due to this, TB patients came from far and near. He had created an aura around his centre that nearly 300 TB patients stood daily in silence in a queue to collect their anti TB drugs; their faces covered with masks. Its support base grew⁵³.

Unfortunately, when Dr Mehrotra left on superannuation after serving for 3 decades, the leadership weakened resulting in a laxity, that could be evidenced everywhere. The neglect in appropriate staffing and supply lines, poor patient attendance became almost a perennial reality. The infrastructure so carefully built over the years - buildings, equipment, facilities - stands there still, in contrast to the prevailing lack of effective TB services. The ups and downs are also seen in the life of such prestigious institutions of international fame.

The DTC was part of the Agra STC from its inception. The Agra DTC never developed to the expectations of NTI and PHIs also did not flourish even during the golden era of Dr Mehrotra. Was it lack of faith in the

principles of NTP by Dr Mehrotra or he was too preoccupied with STC work?

3.5. The great next step

A key function of the NTI was to respond to problems and queries raised by various DTCs, STCs and programme managers situated all over the country. The NTP is a national programme. It should not function in scattered, discrete DTCs implemented around the country without technical links and ready support. There should be uniformity in work procedures.

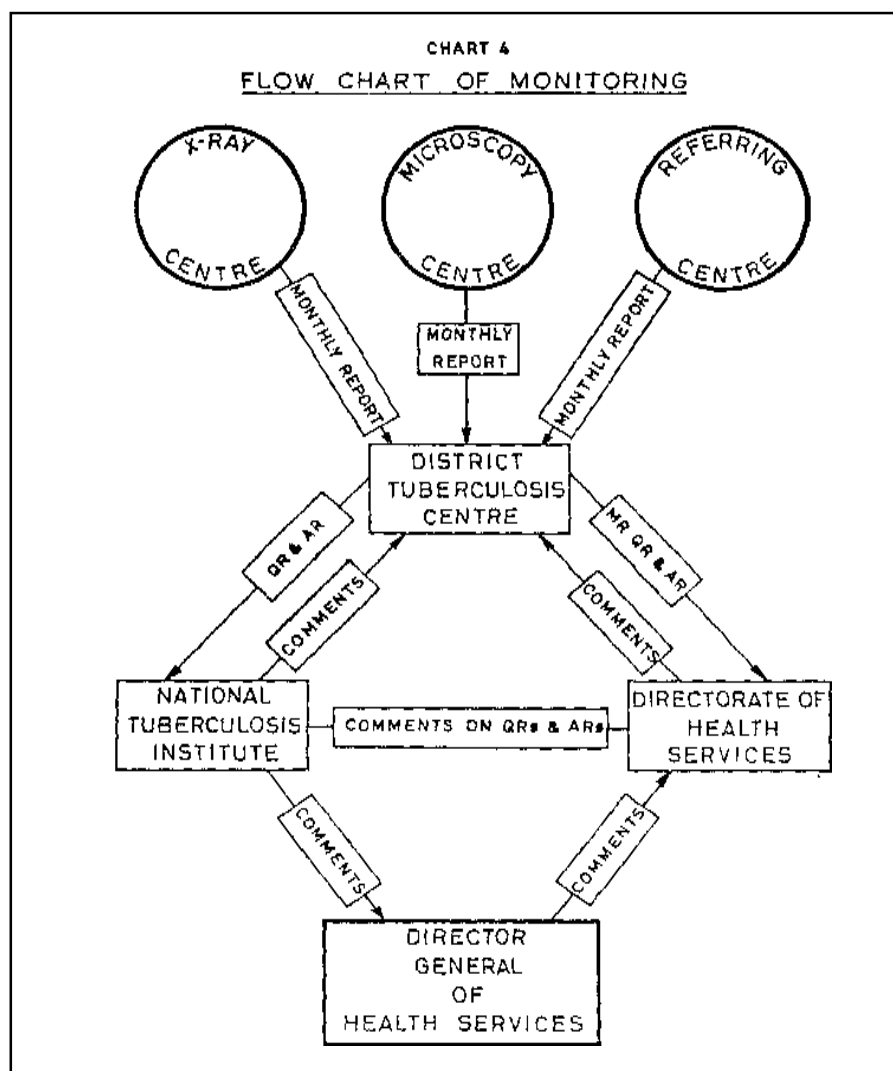
If freedom of action, according to discretion of DTOs was encouraged or flexibility allowed to an extent that different DTCs follow different procedures, then supervision and assessment of the NTP would be rendered difficult. As one progresses, changes for the betterment of the programme methodology or strategy may become necessary. These should be accommodated judiciously after considerable deliberations by the NTI or chosen centres.

The NTI's work, therefore, did not end in training of DTP key personnel, implementation and energising the concerned. It also had to keep a scientific eye on its actual functioning and growth. This task was to be executed in many ways. One was, work done in the various DTCs had to be recorded in standard cards, records and forms which were amenable for inferential statistical computing. In 1963, index cards, treatment cards, quarterly reporting forms were designed and distributed to certain districts on a pilot basis. These were then modified to be used for the national recording and reporting system. In 1964, these were printed with UNICEF assistance and distributed to all DTCs.

3.5.1. Monitoring/Reporting by DTCs

Based on the principles of NTP and in line with the "job-oriented" training given at the NTI, seven manuals were prescribed to programme workers. The first five were meant to guide the DTC key staff. The sixth manual was for

the staff of PHIs. The seventh was the BCG manual. These manuals were to facilitate the execution of activities. These were therefore to be referred too frequently. The DTO, being the team leader, had to be fully conversant with all manuals. The DTO, TO and LT should be conversant with the PHI manual, in addition to their own manuals in order to guide and supervise others. Familiarity with SA manual would be an advantage to every member of the DTC team. The work completed should be reported regularly in the prescribed periodic returns. Extreme caution should be exercised not to deviate from the manual. These should be registered as every form and procedure introduced in the working of NTP had origins in methodical operations research. Each would contain certain vital data which could be used for a variety of scrutiny and analyses. Initially, the NTP was not target oriented. Its working and functions embodied evolutionary seeds wherein both the structure and programme grew steadily under an ongoing evaluation process. The reporting system of DTCs facilitated



Flow chart of DTP Reports

measurement of achievements or work done and gave the necessary inputs for expectations. These could be used to critically review operational and technical performance. Hence, a technically trained SA assisted the DTO. He was not a mere clerk who could compute monthly data and file

periodic returns. In a certain sense, the SA at the DTC would be the evaluator of its functioning. She/he would receive reports of activity from all the PHIs of the district, consolidate them. She/he would assist the DTO in assessment and constructive analysis before filing periodic

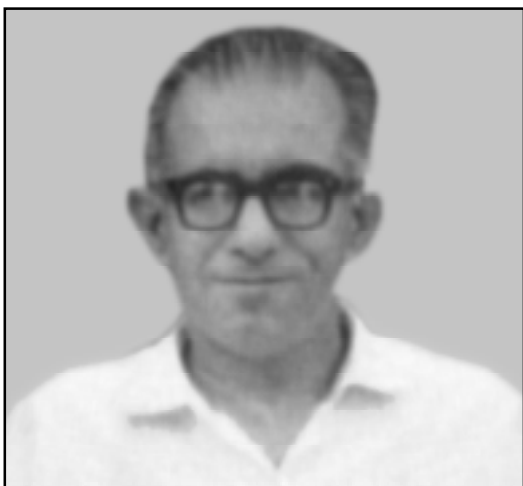
reports to the state and the NTI. The reports are analysed at the NTI which are then sent with comments to the DGHS, New Delhi, state authorities, individual DTCs, for corrective actions to be taken.

3.5.2. Birth of regional centres for monitoring of the programme

In 1965, the proposal was mooted to create two centres: *the Northern Regional Centre (NRC) at DGHS in New Delhi and the Southern Regional Centre (SRC) at NTI, Bangalore* to examine these reports systematically and to provide the necessary guidelines and assistance in assessment. The

SRC was asked to receive and analyse reports from 64 districts of the four southern states of Tamil Nadu, Karnataka (Mysore), Andhra Pradesh and Kerala besides Goa and Pondicherry. The number of sanctioned programmes stood at 47 and of these, 39 were functioning in 1966. As keen as ever in guiding every new effort, in October 1965, Dr Nagpaul initiated the work of the section. He was ably assisted by Dr Gothi as section officer in-charge, with a SA, LT, clerk, to help in this voluminous data processing work. The rest of the country's reports went to the NRC, New Delhi. Dr SD Maqbool was in-charge of it⁵⁴.

In January 1967, the SRC was



*Dr. BC Aarora
Officer I/c Southern Regional Centre*



*Mr. CV Shyamasundara
Statistician*

made administratively independent under the control of the Director, NTI. It was entrusted with the responsibility of comprehensive indexing, monitoring and supervision of the southern region. Dr Arora took over as Regional TB Officer (RTO) of SRC. Dr Nagpaul introduced a system of critical evaluation which encouraged improvement. This was greatly cherished by Dr Arora who began to work energetically in evolving a standard methodology, wherein the SRC would improve the functioning of DTPs under his charge. The section began to review every report critically and sent back educative and encouraging comments wherever necessary.

During March 1968, Dr. SD Maqbool, (RTO, NRC) came to the NTI along with his SA and LT for consultation and training. They attended the 16th training course, toured along with Dr Arora and his SRC team to consolidate their experiences. They developed a 'blue print' of activities of the regional centres⁵⁵. However, there were a myriad of practical details to be attended to besides paper work.

The NTP was a living programme replete with problems. For e.g., the DTC personnel keep on changing. They would have queries. The newly installed MMR (X-ray) machines were imported. If these developed problems, the X-ray work would stop. Occasionally, even the microscope may become defective. The drug supply line may develop a missing link. These problems had to be addressed. Since it was a policy of the NTI to extend as much help and guidance as possible, some of these jobs were assigned to the SRC. There were, as usual difficulties. For e.g., the staff allotted to the SRC was limited. It had only two technically competent persons viz., the SA and the LT besides the section officer. The LT was therefore trained as an XT so that he would be of some practical use at the DTC when he visited it. The LT, in addition to his normal duties also undertook fault repair work of microscopes. He brought back the irreparable ones to NTI for replacement. Since he was also trained as an XT, he assessed repair work/replacement parts needed for the X-ray machine. Upon return to NTI, the X-ray

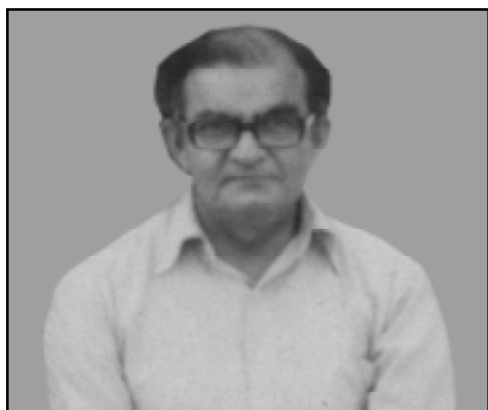
section was intimated for suitable action.

The budget allotted was also limited and the SRC had to plan team visits frugally. Therefore, Dr Arora had to study all the reports and arrange the teams itinerary so as to visit the ailing DTCs on priority or where the teams' personal guidance would be most useful. Sometimes, he would split the team into two so that more DTCs were covered by personal visits. During the visits, the team worked systematically, and even visited far flung PHIs to get the first hand knowledge of its working and problems. They offered solutions wherever possible and made lists of the unresolved ones. These were presented to the STO at the state headquarters. The teams also took note of a host of new ideas of a minor nature. These were brought to the notice of NTI for further discussions. If valid, these were kept in reserve to be included in the concerned manuals when revision took place. Till he attained superannuation, Dr Arora worked tirelessly. Like majority of the Central Health Services (CHS) MOs in those days,

he too retired without getting a single promotion. Thanks to Tikku Commission; today the MOs have time bound promotions. During his tenure he was in touch with every DTC under his charge either through correspondence or personal visits. He gathered voluminous data continuously some of which were fit for scrutiny and incorporation when the manuals were revised.

3.6. Milestones in BCG work

From 1951 onwards, India was covered by the BCG Mass Campaign. Approximately 170 (more than 190 at times) full-fledged teams, toured the country setting up BCG vaccination centres in both rural and urban parts, offering BCG vaccination to all. It was the first organised effort outside Europe and was the biggest campaign undertaken by any country in medical history. Even though jeeps were provided, it was to the credit of the teams that they set up camps in so many inaccessible places. India's vast network of rural areas had no pliable roads. Sometimes, even bigger towns could be reached



*Dr. Kul Bhushan
BCG Research officer,*



*Dr. Pyarelal, Medical Officer
Awarded gold medal for eradication of
last case of Smallpox in India*

with great difficulty. Infrastructure like lodges and hostels was inadequate.

Added to these difficulties was the cumbersome two step procedure of the vaccination itself: every one had to receive a pre-vaccination tuberculin test with 5TU PPD RT22 batch of the tuberculin, come back for tuberculin reaction measurement three to four days later and if her/his reaction was less than 8 mm in size, she/he would become eligible to receive BCG vaccination. The teams tuberculin tested 165 million and vaccinated 65 million⁵⁶. In 1964, as Dr Kul Bhushan recalls in “My experiences of Mass BCG Vaccination “.....Combined efforts of

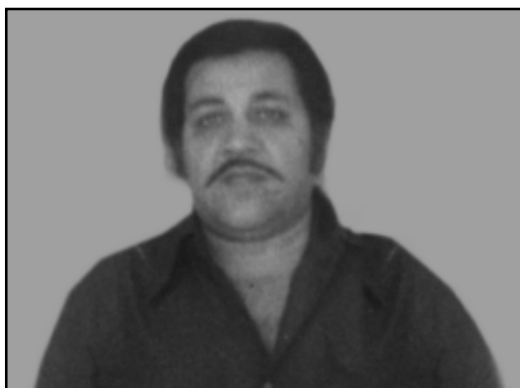
the teams...helped the campaign I saw dedicated workers busy for 18 hours a day... .I have known one who slept 16 hours a day and divided the remaining eight hours, judiciously into bits of two hours each between dressing, getting ready for the day's work, sipping tea, meeting friends and taking well earned rest and food! I cannot forget the technician whose woolen suits served as a mobile refrigerator for the vaccine... . Those who walked 8-10 miles a day to cover houses in hilly areas testing small two digit figures... . It was a pleasure to see systematic coverage of areas in some states... . In a few others...it was not so...I was disappointed to see teams leaving vast areas uncovered.... I realised how easy it is to convince the public but not administrators”⁵⁷...



BCG Mass Campaign team at work

Besides conferring the benefits of BCG vaccination, the campaign produced a wealth of data on the tuberculin sensitivity patterns prevalent in the country and indicated the hitherto unsuspected extent of the TB burden. There was an additional benefit as pointed out by Dr Benjamin. Besides making BCG available to anyone residing anywhere in the country either urban or rural, it also served as the biggest ever health education programme undertaken anywhere in the world. The masses of India became aware that the utilities provided by the Department of Health that could be used by them gratis⁵⁶.

However, an assessment of the campaign's methodology had to be made because of three major reasons. First, the teams had no option but to set up vaccination centres in some central place. Despite announcements and propaganda for people to avail of the facility, it was obvious that only action takers came to the centre. That left a large proportion of people uncovered. Second, the screening tuberculin test proved to be a deterrent. Because of fear of two pricks, absenteeism increased. It is not strange for people to question receiving two pricks for the same disease that they are not suffering from. The third was a technical



Mr. Vijay Singh, BCG Team Leader



BCG given by Multi Purpose Workers (MPWs) at Health Centres



*A milestone in Campaign's History
VI All India BCG
Workers Conference at Bangalore
on 13-14th Jan 1962
Benjamin addressing the delegates*

one. Evidence from the earlier campaigns indicated that a majority of people over 20 years of age were tuberculin positive and therefore, ineligible for vaccination. About 97% of children (0-9 years) were tuberculin negative. The teams, therefore, were burdened with a lot of redundant work. It would be beneficial to restrict BCG to 0-19 years⁵⁸.

The NTI studied these problem areas systematically. The 6th All India BCG Workers' Conference was held on January 13th and 14th, 1962, at the NTI premises. Over 100 delegates from various states attended. Doctors D'Silva (UNICEF) and RH Bland (WHO) also attended and represented their organisations. Dr PV Benjamin presided. Among others, Drs GVJ Baily and Kul Bhushan of NTI presented papers. Based on the NTI studies on door-to-door BCG vaccination, Dr Baily pointed out that the coverage of vaccination improved (up to 8%) by adopting house-to-house vaccination strategy. However, the procedure was slow and the output of work would be low due to time taken up

in registration of every individual of the household. Instead the team visits could be utilised as part of the DTP (such as assisting in diagnosing TB cases)⁵⁶. Presenting his paper on freeze-dried BCG vaccine produced at Guindy Laboratory in Madras, Dr Kul Bhushan stated that though liquid vaccine produced slightly higher allergy than the freeze-dried vaccine, the level achieved by the latter was quite adequate. Further studies would be undertaken to assess the qualities of the Madras vaccine, as it was new⁵⁹.

This led the GOI to create a DTC in each of the 318 districts. Based on the recommendations given by the conference, the GOI suggested integration of the BCG campaign with DTC. The conference was the most significant held so far. Firstly, because of the discussion regarding integration of the campaign with the GHS. Secondly, because of the presence of administrative MOs. Thirdly, because decision was taken to introduce house to house vaccination campaign during the Third Five Year Plan. Ultimately, in 1978 the BCG campaign was

integrated with GHS and became part of Universal Immunization Programme (UIP).

In 1964, Gothi found that BCG vaccination could be given directly without tuberculin test. There were not many large or untoward reactions to BCG⁶⁰. In 1965, Dr Kul Bhushan suggested that direct vaccination in 0-20 year age group could be carried out because it was the most vulnerable⁶¹. There were added advantages gained over the mass campaign method in terms of systematic coverage and proper record keeping. In accordance with these findings and studies, a manual for BCG workers was prepared and field tested. By 1966, 44 of the 189 BCG teams were integrated with the DTCs and gave satisfactory outputs.

However, another issue arose. Would there be any immunological interferences especially among children below one year, because they would be receiving both BCG and smallpox vaccinations? Dr Kul Bhushan found no evidence of immunological interference between the two vaccines

even when administered simultaneously. Surprisingly, the acceptability of the simultaneous procedure was higher than when BCG was given alone⁶¹. By the time this scheme could be fully implemented the smallpox vaccination was discontinued, as it got eradicated in 1975.

In 1973, Baily literally wound up the mass campaign approach by making the PHC personnel like Auxiliary Nurse Midwives (ANMs) and Basic Health Workers (BHWs) responsible. They would give BCG to new borns in their areas by vaccinating them once a month in nearby sub-centres. This had great operational advantages besides reducing vaccine wastage⁶².

Another problem emerged following the introduction of direct BCG vaccination. As the coverage of BCG vaccination increased in the population, tuberculin surveys would be progressively rendered difficult. One may not obtain sufficient number of unvaccinated persons to represent the population to carry out tuberculin surveys for assessing the prevalence of

infection. Are there ways in which information of prevalence of infection could be elicited from BCG vaccinated persons? For e.g., could BCG vaccination induration size be used as an indicator of infection with *M.tb*? In 1974, Gothi and others presented a paper showing that vaccination induration could be used as an indicator of tuberculous infection. Vaccination induration of 14 mm or more on fifth or sixth day appeared to be the best criterion for demarcating the infected from the non-infected. Even though there were other choices, e.g., 12 mm or 14 mm on second day etc., the choice of 14 mm on fifth or sixth day of vaccination satisfactorily demarcated persons infected with *M.tb* from those non-infected⁶³.

Under Dr Kul Bhushan, the All India BCG Assessment Team was instituted for assessment work of the mass BCG teams in different parts of the country. The team was small and had to tour extensively in the most adverse conditions. During the days of the steam engine, it would take three days for the team to reach a city or town

in Rajasthan from Bangalore. From there, the team had to reach its destination on whatever transport provided by the state government. It had the additional task of retesting groups of population vaccinated with two BCG vaccine strains: the Madras freeze dried vaccine and the Japan freeze dried (glutamate) vaccine. For the BCG vaccine laboratory, Guindy, it had to carry out a comparison of stock solutions of RT22 and 23 batches of tuberculins. It is to the credit of this small team that it conducted the two studies among 5-16 year old school children in West Bengal. The study was inconclusive but indicated that the increase in the storage temperature resulted in the higher loss of potency of the vaccines⁵⁹. In addition, Dr Raj Narain and others had also taken up the task of comparing the allergy producing capacity of the Madras and Danish BCG vaccines. They found that the allergy producing capacity of both the vaccines was not different⁶⁴.

3.6.1. Controlled clinical trial for efficacy of BCG vaccine

NTI was also concerned with the *efficacy of the BCG vaccine itself*. BCG vaccination was the only available protective measure against TB. Different trials had not revealed credible proofs quantifying its efficacy. Many, including late Sri C Rajagopalachari even thought that its efficacy was not fully proven and strongly advocated against its continued large scale use. It would be in the interest of the country to undertake a well designed trial to seek clear answers to the major issues confronting it. Therefore, as stated earlier in Chapter 2, the NTI had been vigorously planning to conduct a major BCG trial and had even reserved certain areas in the country as vaccination free zones. It was in touch with the international scientific community, various vaccine production centres and experts in the field. In January 1964, it initiated intensive discussions with the WHO experts and representatives from United States Public Health Service (USPHS). It was agreed that any

trial undertaken must not interfere with the progress of NTI and NTP; and because such a trial was expensive and prolonged, it would have to be designed with utmost care and efficiency.

After extensive discussions, the USPHS agreed to give a grant from the PL480 funds in India. WHO agreed to provide the services of Dr J Guld and some funds. The NTI decided to spare the services of Dr Raj Narain as its first Project Director; experienced field supervisors, investigators and provide other key staff requirements; office

accommodation; transport and some equipment so that this important work could begin immediately⁶⁵. Dr Guld began his regular visits to NTI and started several BCG vaccine and tuberculin related studies: effects of diluents, sterilising agents, ampoule to ampoule variations in the potency of tuberculin dilutions; comparative studies of different antigens and different BCG vaccine strains, etc. Besides Dr Guld, Dr G Weijsmuller and others from USPHS visited the NTI and started several feasibility studies.

Ultimately, the project named



*Feasibility Prevention Trial (Chingleput BCG Trial Team)
with Drs Raj Narain & Guld taken at NTI, in November 1967*

Feasibility Study for TB Prevention Trials became part of the ICMR and moved out of the campus to its own building⁶⁵. In time, its studies showed that the major BCG trial would be best if conducted in Chingleput district of Tamil Nadu than in other areas reserved for the purpose. Field work began and the office was moved to Madras. In spite of shifting of the project camp to Madras, NTI continued to assist the BCG Trial by providing technical guidance and replacement of staff. When Dr Raj Narain retired, Dr Baily joined as the Director of this study and continued to serve till the first report was published⁶⁶.

The BCG trial was completed as scheduled. After a period of twelve and a half years, it brought out a revolutionary report. It showed that BCG vaccination did not offer any protection against TB of the lung. Several expert committees appointed both by the authorities in India and by the WHO examined all the procedures followed up in the study and came to the conclusion that the study had been meticulously carried out and

vaccine used in the trial were the best available ones⁶⁶. The implications of this study was: Should BCG vaccination be given up in India? Another committee appointed jointly by ICMR and the WHO went into the epidemiological aspects of the causation of TB under Indian conditions. It concluded that though BCG may not protect against TB of lung which occurs mostly in adults, it **could provide substantial protection against childhood forms of TB** such as tubercular meningitis, TB of bones and joints, etc. The protective effect of BCG against these forms of TB was not studied in Chingleput Trial. In India BCG vaccination policy was revised and it was recommended to be given at an early age preferably before the end of the first year after birth by integrating under UIP⁶⁷. BCG vaccination policies in other countries were also revised as a consequence of the Chingleput study findings.

3.7. Expanding horizons of research

A careful review of Annexure II would surprise scholars of any

discipline as to the rich diversity of the protocols considered, research studies conducted, new paths traversed and papers published. Some of them, *Evaluating TB as a health problem (RP/74)* may look mundane. Was this study required when there were so many other pressing ones? Others, *Assessment of training at NTI (RP/99)* may appear daunting. Do you have to be self-critical already? Some, *Incidence of cases at shorter interval survey (3 months) (RP/101)* may raise eye brows. Can one really find new cases in such a short time? How many can be found? Even if found what can be done? Some, *Action taking study (RP/54)* may seem to possess utilitarian value. Some, the *Longitudinal survey (RP/33-45-73,80-89,93)* must be necessarily undertaken. Some, *Integrated records and reports for health institutions (RP/108)* may seem redundant. Why should a study of this sort be done here? The study, *The role of multiple sputum examination (8-10 specimens) (RP/103)* may seem unnecessary. Should you repeat the same examination time and again? Is it not going too far?

But this sort of over critical temper mellows when one is working with a disease like TB. Realistically, TB is a hardy and problematic disease. There may not be one single truth or a simple formula applicable in public health approaches. People in reality translate into groups or communities consisting of persons of different age, sex, backgrounds and customs. There can be ever so many constantly changing determinants. To determine what is required from such groups, demands great understanding and observational skill. Fortunately, from the operational studies conducted both in training and research fields, the NTI had acquired knowledge and experience.

Therefore, everybody concerned became flexible. Devotion to work became a byword. Team spirit was easily achieved because everybody did a bit extra till a goal was achieved. As a result, the total knowledge pool grew deeper and broader. Some of the best research studies completed, innovative methodologies discovered, implemented and papers published

were during the first 15 years.

Till they left, Dr Raj Narain and after him Dr Gothi, were piloting all research studies conducted by the EPS. There were many investigations too, of short duration, examining a specific issue. For e.g. the Tumkur prevalence survey published in 1963 had shown that 14% of the bacteriologically confirmed and 23% of radiologically active TB cases gave negative reactions to 1TU RT23 with tween 80 at less than 9 mm level. This was somewhat puzzling. How can such cases be tuberculin negative? A short study, therefore, was carried out among 131 patients in a TB sanatoria using the same tuberculin. The reactions were read successively on the following 10 days. A fresh X-ray was taken for the patients who were able to come to the unit. Their sputum was examined for acid fast bacilli (AFB). The results showed that a very small percentage of TB patients were tuberculin negative and readings beyond four days did not add much to the information content⁶⁸.

Several papers were published in the area of treatment. In 1965, V.Govindaswamy and D. Savic presented a paper which stated that there will be some difficulties among the DTC personnel themselves in accepting the principle of intermittent regimen due to personal prejudice. A considerable portion of patients were also lost due to irregularity in accessing treatment⁶⁹. In a paper on collection and consumption of drugs, published in 1971, it was found that among patients who collected the drugs regularly, 70% of them consumed and achieved a high degree of bacteriological quiescence⁷⁰. In the paper published in 1973, *Place of contact examination in a TB programme*, Nair and Gothi could not justify the inclusion of contacts of TB cases as screening population for case finding until the potential yield of cases from symptomatic out-patients was fully utilised. Contrary to the currently held belief, examining the contacts of cases for TB would yield small number of cases. It would add heavily to costs and therefore would not be an economically viable method⁷¹.

Several important papers were published on the programme development. In 1967, Baily and others published the paper, *Potential yield of pulmonary TB by direct microscopy of sputum in a district of south India*. The authors estimated that about 45% of the total estimated prevalent pulmonary cases in a district could be diagnosed in a DTP during one year, if all PHIs functioned according to the programme recommendations. The work load due to the TB programme could be managed with the existing staff⁷². The paper was so influential, several countries followed its design and conducted studies. Dr Jagota repeated it 30 years later. The findings were similar⁷³. Upon learning this Dr Baily commented: *"I am happy that the study was repeated 30 years later. But I am not happy because the findings remain the same which means that there is no improvement in the programme."*

Three years later, in 1970, two important operations research papers were published. Nagpaul and others conducted a socio-economic study of out-patients attending a

city TB clinic to judge the place of specialised centres in a TB control programme. They found that distance, socio-economic value of the patient to his family, quality of service rendered by the centre tended to be factors responsible for patient attendance, even if the patient was suffering from symptomatic discomfort and was aware of it. Rural dispensaries occupied a favourable position in the programme since they operated under a more coordinated system than city dispensaries⁷⁴. In the same year, Gothi and others published the paper showing that a fair number of old and new TB patients contact the GHS even in a city and therefore, the GHS could contribute to case finding activity⁷⁵.

The role of NTI with regard to treatment has always been to find a chemotherapy regimen with higher efficiency and acceptability for the programme. Therefore, its perspectives are larger and varied than that of TRC, Madras. Before a treatment regimen is recommended for mass use under a programme it undergoes evaluation in at least three stages.

At the first stage, controlled clinical trials of the drug regimen testify to its efficacy under ideal conditions after ensuring that every patient put on treatment consumes most, if not all, the prescribed doses of chemotherapy within the stipulated period. In the second and third stages of evaluation, regimens are studied for wide spread of applicability on a routine basis. The second tier consists of the potential efficacy, when all the programme recommendations are satisfied; efforts invested are no less and no more. In the third stage, the regimen is actually introduced in several units of the NTP on a pilot basis and carefully monitored with selected indices over a period of time to assess its success and shortcomings on a large scale.

In 1974, Baily and others measured the potential efficacy of two standard DTP drug regimens of one year duration, the daily self administered Isoniazid and Thiacetazone (TH) and supervised twice weekly Streptomycin and Isoniazid (SHTW). In this study, 60% of the patients who received treatment on TH and 68% of those

initiated on SHTW were bacteriologically negative at the end of one year. This was opposed as against sputum conversion rates of 82% and 94% respectively obtained in controlled clinical trials of these regimens. A loss in bacteriological conversion in about 20-30% of patients were observed in clinical trials to their use in the programme conditions⁷⁶.

Attention was also paid to the requirement of treatment for smear negative, radiologically active pulmonary TB cases (suspect cases). During 1979 Aneja and others reported the finding of a study of 457 suspect cases and found that only half of the suspect cases put on treatment actually required anti-TB treatment. The other half were either non-tubercular or had burnt out TB shadows in the chest. The study further revealed that for those suspect cases requiring treatment TH regimen was not sufficient and they needed a more potent regimen⁷⁷.

In addition to the voluminous studies in major fields, NTI also



*Dr D Savic SMO WHO
1965-1968**



*Dr T Olakowsky SMO, WHO
1970-1972**

* : Term of office



New lab.setting

conducted scores of limited objective pilot studies. For e.g., in 1964 it conducted tuberculin testing of cattle (300 buffaloes and cows) with both mammalian and avian tuberculins. A short report was published in the NTI Newsletter in 1964. The findings showed that the prevalence of positive reactions in buffaloes was 80% and in cows 0.5%. The results were not conclusive. However, very few humans had reportedly developed a disease from the *M.bovis* strain despite the observed close contact between humans and cattle. Not a single bovine strain was isolated from 300 positive cultures from another study carried out among humans in the neighbourhood⁷⁸.

The above study was made possible because of the induction of Dr N Naganathan as Jr. bacteriologist, who was a trained veterinarian. He rendered invaluable service to the work of that section through his tenure. He was responsible for shifting the entire laboratory from the cramped quarters of the main building, to its newly built premises. He also initiated

action in establishing an animal house to breed guinea pigs and other animals needed for experimentation.

During those early years, the bacteriology section undertook several studies and exercises to evolve a robust methodology suitable for a reputed lab of a large developing country. Robustness implies maintenance of high and accredited standards in laboratory procedures, processing of data and reporting. Since the functions also included teaching and field work, some investigations went beyond the four walls of the laboratory. For e.g., what will be the fate of the specimens collected in different locations at intervals of 24-48

hours? What guidelines are to be followed in the collection of a sputum specimen and its despatch to a central laboratory from distant locations? What would happen if the processing of smear and culture of specimen got delayed between 1-7 days? What would be the increased yield of cases by introducing culture examination over smear examination only? Is the cold staining method using carbol-fuchsin containing chloroform as efficient as Ziehl Neelson (ZN) method? Would there be inter and intra reader variation in direct microscopy casting influence on sensitivity and specificity? What is the prevalence of drug resistance to major anti-TB drugs in different



Lab at work



Sputum specimen collection

epidemiological situations - (i) sanatoria, (ii) urban TB clinic, (iii) rural GHS, (iv) mass case finding among select groups of population and (v) survey of general population? What would be the cost of establishing and operating a TB bacteriological laboratory? What are the likely costs of one smear examination vis-à-vis culture and sensitivity tests?

In 1970, a very important paper: *Bacteriological diagnosis of pulmonary TB – sputum microscopy*, was published⁷⁹. Some of the issues examined were: (i) different criteria adopted for examination, (ii) different epidemiological situations from where the sputum specimen was collected, (iii) sensitivity and specificity of sputum microscopy technique adopted, (iv) experience of the trained technician, etc. Observations revealed that several factors like: (i) quality of sputum smear, (ii) time spent on smear examination, (iii) type of sputum specimen, (iv) use of multiple smears, tended to influence the results⁷⁹.

The NTI laboratory was doing quality

work which matched national and international standards. In 1974, NTI laboratory work standards were comparable to the TRC, Madras. Specimen classification of the NTI laboratory was matched with the TB Laboratory of the Communicable Diseases Centre (CDC), Atlanta USA. The results showed that the standards of the NTI laboratory favourably compared with these two institutions. The same year, Dr Naganathan published an article: *Some guidelines for establishing a TB culture laboratory*.

3.7.1. Innovations in approach

Several innovations were constantly being made in field work. For e.g., the conventional method of measuring (reading) tuberculin indurations was the transverse method. Could this be done differently, for e.g., the longitudinal way? In field experiments conducted, experienced tuberculin reaction readers showed that they could fix the perimeter or the edges of the tuberculin indurations and align them to the mantoux ruler more accurately the longitudinal way than the conventional

transverse way. The longitudinal diameters were, on the average, slightly larger than the corresponding transverse diameters for all the ranges of reactions. However, considering 10 mm + reactions as infected, the prevalence of infection was similar in either method⁸⁰.

Yet another example was the development of film loading black boxes. As narrated earlier, the MMR X-ray units were used by the teams in randomly selected study areas. Some times these areas were very remote. The number X-rayed were about 80-100 on the average and touched 200 or more on some days. About 40 X-ray exposures could be made on a 70 mm roll of film. Therefore, on an average two and a half to five rolls would be needed for the day. After each roll was completely exposed, a new roll had to be inserted in the cassette. The imported mobile X-ray units had provided a black cloth bag film loading facility. These were too small for maneuverability. It took a long time for the XT to unload the exposed film and to load a new one. At the end of the day,

or on days when the work load was less, a partly exposed roll had to be cut to avoid wastages so that the unexposed film could be utilised the next day. This manoeuver was difficult with the black bag facility. It was modified and replaced by a film loading box.

Not content with the limitations of single picture interpretation of MMR chest, a comparison of the relative value of single and double picture technique was made two years later in 1964, under field conditions. Two mobile X-ray units were used (both had odelca cameras) and two thousand persons were X-rayed on these two units in succession and films were independently read by three readers. In the final analysis, the double picture technique did not offer advantage over the single picture technique. Perhaps it is how carefully the technician takes the X-ray chest and how carefully the radiologist reads and interprets the film that were more important than the number of X-ray films a patient had or the number of X-ray readers reading them⁸¹.

About 40-50% of the X-ray equipment were unused all over the country because of inefficient technical understanding, poor selection of equipment, poor planning in housing the unit, inadequate maintenance facility and lack of trained personnel. The estimated losses due to these reasons alone amounted to Rs 71 million in 1969. There was an urgent need for development of infrastructure and better utilisation of the costly and imported equipments. The NTI had gained vast experience and expertise by running its own mobile X-ray fleet and stationery X-ray units, as well as attending to the problems that arose with the stationery units at the DTCs and hospitals. The above is a mere tip of the ice berg of the problems related to the proper functioning of the sophisticated equipments in the country⁸².

3.8. Results of the longitudinal survey

As reported in the second chapter, about 60 NTI personnel worked directly and almost everyone

indirectly to complete the field work which began in 1961 and ended in 1968 on schedule. It took nearly as much time to analyse the data. Many experts came and assisted or interacted as short term consultants. A summary report was published in the WHO Bulletin in 1974. A fuller version is available in the library for reference⁸³.

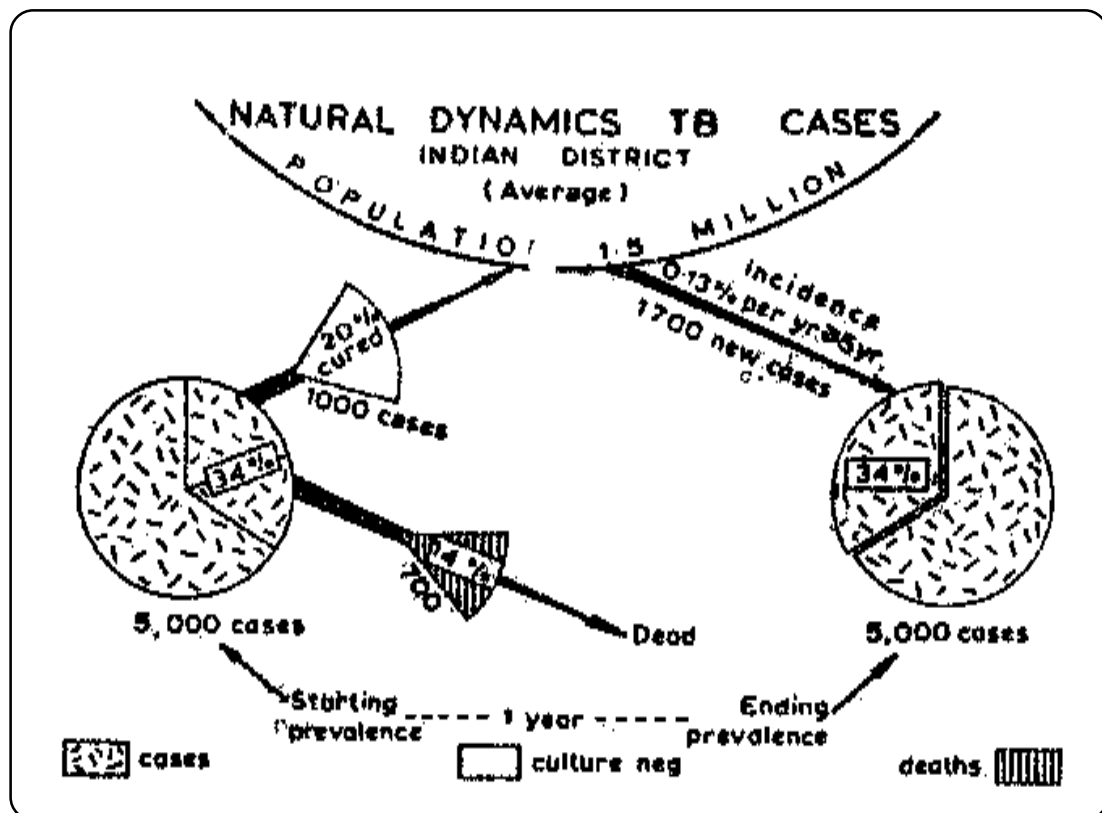
The paper, yielded vast credible information on the desired objectives. It provided insights into the disease dynamics and became a forerunner for new studies. The prevalence of tuberculous infection in the population was found to be about 30%. The annual incidence of infection was about 1%. The overall incidence of infection ranged from 1.61 to 0.85%; the incidence of infection continuously increased in the higher age groups. However, the prevalence and incidence of infection showed a significant decrease during the five years in the age group 0-24 and 0-34. The average annual incidence rate of disease ranged from 79 to 132 per 1,00,000 population. The incidence among the newly infected (between two

rounds) was seven times the rate for those already infected. Those with >20 mm reaction had higher annual incidence rate of disease. Out of the 126 cases followed up during the 5 years, 49.2% died, 32.5% got cured and 18.3% continued to remain sputum positive. The incidence cases showed a natural cure rate of 20% and a mortality of 14% over the immediate observation period of one and a half years. This showed a higher natural cure indicating

that TB cases were not a uniform entity. There could be gradations from the point of view of diagnosis and ability to benefit from treatment⁸³.

3.9. Outcome of longitudinal survey – natural history of TB

Longitudinal surveys are time and resource consuming without yielding the immediate results. It requires courage to assume this type of work. The foresight made



Disease Dynamics : Natural History of Tuberculosis

the NTI to take up the challenging and repetitive work of the longitudinal survey. Not that repeat surveys had not been done earlier elsewhere. Dr Frimodt Moller had done it in south India⁸⁴ and the NDTC had done it in north India⁸⁵. But the planning and approaches of NTI were different in that it included in-depth repeat surveys which were conducted at fixed intervals. Thus the natural history of the disease, as prevalent in a rural community, could be studied methodically.

In November 1977, Dr Gothi delivered the Wander-TB Association of India Oration: *Natural History of TB*. In the Oration, he had incorporated many of these new aspects culled out carefully from the longitudinal survey. He found that about 5-8% of the total infected persons may develop primary or post primary disease. He also drew on the valuable contributions made by a host of experts both from India and abroad. These insights added a new dimension to the thinking and sharpened prognosticating abilities as well. He stated that the

epidemic of TB spans into centuries. The anti-TB measures specially drugs in particular, have not only changed the outlook for individual patient but by reducing infectivity period have speeded up the decline of TB in the community as seen in Japan and Eskimos in Canada⁸⁶. Twenty five years later, in 1992, Chakraborty and others⁸⁷ used the data to deliberate the *23 year trend* and suggested an average decline of 3.2% per annum, a trend probably representing the natural dynamics. These were eye openers because it is not easy to escape from the text book definitions or narratives of famous clinicians rich in experience and to gain afresh unbiased picture. These insights impelled the NTI to plan newer studies: Incidence of pulmonary TB and change in bacteriological status of cases at longer intervals of 12 years (1974); and at shorter intervals of three months (1978). The latter study revealed that *cases converted or reverted even at shorter intervals and this appeared to be going on continuously in the community*. Incidence of cases over a period of three months was 0.99 per thousand which was not very

different from the annual rate of 1.03 per thousand. However, incidence of cases, cure and death from among the existing as well as fresh cases kept on balancing each other so that the prevalence rate of cases studied at shorter intervals did not show variations⁸⁸.

In 1979, Gothi and others presented the findings of a repeat survey conducted in Tumkur in the same set of villages and towns and town blocks of the initial survey 12 years later⁸⁹. The first survey was conducted in 1960-61 when there was no organised anti-TB programme in the district. Since 1964 the area was under the cover of NTP. A DTP was organised in the entire district in 1964. One of the objectives of this repeat survey was to determine if there was any

change in the prevalence rates of infection and disease following the implementation of the DTP. The findings were: over a period of 12 years no appreciable change in the overall prevalence rates of tuberculous infection was observed in the same area. The fate of sputum positive cases diagnosed at first survey was : about two-third dead, one-fourth negative and 8.1% were positive for M.tb. It appears that surveys conducted at intervals of 10-15 years may reveal little change in the prevalence rates, as TB is in endemic phase or follows a slow downward trend. One could conclude that 12 years period is too short an interval for natural dynamics of disease and the DTP has not shown any dent on the problem⁸⁹.

In 1978, KS Aneja and AK Chakraborty wrote the observations of many experienced clinicians that "TB has undergone a considerable change in its clinical presentation, specially over the last quarter of the century. Many retrospective studies have clearly brought out the gradual change from a comparatively more acute and extensive disease among the young to a more chronic, less extensive disease among the elderly. There is also consensus that there is a marked decrease in the concomitant problems of pulmonary TB like enteritis, laryngitis, lymph adenitis with discharging sinuses, etc. It is significant that very similar changes were noticed in the countries where TB had definitely declined".

In 1982, Chakraborty and others published a report on the population of the longitudinal survey resurveyed 16 years later (1961-77). The population sample was restricted to 22 villages of Bangalore district. Even this repeat survey showed that the prevalence of cases did not differ significantly from survey to survey. The variation from first survey to fifth survey was 3.96 to 4.92 per thousand. However, there was a shift in the mean age and better survival rate of cases diagnosed at later surveys⁹⁰.

3.10. Sub studies

Subsidiary papers began to be published from 1965 onwards (Annexure IV). Several penetrating investigations and studies within studies were carried out concomitantly to seek answers to a variety of pressing questions. A few examples: *Enhancing of tuberculin allergy by previous tuberculin test* (1966). *Resistant and sensitive strains of M.tb found in repeat surveys among south Indian rural population* (1968). *Prevalence of non-specific sensitivity to tuberculin*

in a south Indian rural population (1976). *Estimation of the number of repeat examinations required to detect all TB cases in the community* (1976). *Incidence of TB among newly infected population and in relation to the duration of infected status* (1976). *Relapse among naturally cured cases of pulmonary TB* (1976). *Use of 20TU RT23 and 5TU Battey antigen for estimation of prevalence of non-specific tuberculin sensitivity* (1977). *Incidence of sputum positive TB in different epidemiological groups during five year follow up of a rural population in south India* (1978). *A comparison of new cases (incidence cases) who had come from different epidemiological groups in a rural population* (1978)....the list steadily grows.

3.11. Accomplishments in knowledge dissemination

The steadily growing knowledge in TB control brought with it a type of pressure that urged the NTI to find newer paths to tread than lecturing, teaching, training, conducting seminars and writing papers because every path had its own objective oriented limitations. The NTI had ambitious plans to



Old Library in 'Avalon' Building



New Library in 'Dr. PV Benjamin' block

reach out. One thing it did on priority was the expansion of library facilities. By 1970, its annual budget was doubled to one lakh rupees and its floor area more than doubled. In addition to the regular services, the library started the following activities: current awareness service, indexing service, selective dissemination of information, compilation of mailing addresses, user education programmes and systematising information to different levels for e.g., programme supervisors, state TB demonstration and training centres, health institutions, academic institutions, functioning health centres, allied teaching and research institutions. The library and dissemination services rapidly became a cynosure for all the trainees, visitors and distinguished TB workers. In fact, its services contributed to the growth of the NTI by taking cues from contemporary events elsewhere and helpful to inform others.

A disease like TB cannot be tackled by a few, however dedicated. The methodology discovered by NTI had to be widely disseminated. Hence

an idea of starting a *new medium* to inform others began to germinate in 1963. Dr Nagpaul lost no time and brought out the maiden issue of the NTI Newsletter in May 1964. In the editorial he wrote the following memorable lines:

“Placing the first issue of the NTI

Newsletter in your hands has given a sense of achievement. Hereafter our energies will be directed towards making the Newsletter a worthy instrument of communication between the Institute and the growing circle of our well wishers and alumni. Through the Newsletter, the Institute becomes an open letter to you to comment upon, suggest, inform or criticise.”

NTI		
NEWS LETTER		
VOL. I	MAY, 1964	No. I
□ Tuberculosis is curable - P. K. Sen 1		
□ India's Tuberculosis Problem - Stig Andersen 5		
□ Planning A Tuberculosis Control Programme in India -R.C. Sharma 9		
□ NTI News 14		
□ Abstracts 17		
" If a man will begin with certainties he will end in doubts ; if he will be content to begin with doubts he shall end in certainties". - Francis Bacon		

*Facsimile of NTI Newsletter
Maiden issue*

The newly founded Newsletter was designed for administrators, research workers, policy makers, NGOs besides programme workers. Its users would be both medical and para medical personnel. It would not become too technical and high-brow. It would be a quarterly. Besides publishing what NTI wanted to report about programme information, it would contain popular articles, abstracts, select

bibliographies, news about the NTI, readers forum, question and answers. It would also contain messages. A sample:*

Set against odds, it broke new ground and traversed different paths. Therefore, its reputation spread far and wide. Especially, TB workers of long standing repute came from all over the world. A sample – Dr MD Deshmukh, Dr PK

**Dr Cheera Chamnanvanakit
Khon Kaen Chest Clinic
Thailand*

I am grateful to receive the NTI Newsletter as an alumnus and am especially happy to read the editorials. Having gone through the article, "Results of chemotherapy under programme conditions", I now feel that implementation of the TB programme needs to attend to many factors in order to reach the expected efficacy of chemotherapeutic drugs. How can this be done, when perhaps the greatest barrier is fear on the part of the medical professionals themselves? They are afraid of TB patients, of examining sputa etc., on account of infection. How can our programme go forward?

I am the editor of our Regional TB Newsletter. My main purpose is to sell new ideas, change old concepts and motivate the workers in the TB field for greater efforts. I feel that to influence the behavioural pattern of our doctors, including professors in medical colleges, one must decide conclusively on the endogenous exacerbation or exogenous superinfection controversy, to allay their fears of infection.



*Dr. Sushila Nayar
Union Health Minister 1964 &
Founder Director, MGIMS, Wardha,
Sevagram*

Sen, Dr BK Sikand, Dr J Frimodt Moller, Dr K Toman, Dr J Guld, Ms Leela Dushkin, Dr Gallagher, Dr SP Gupta, Mr A Billington, Dr Carroll E Palmer, Dr Shirlee H Ferebee, Dr Susheela Nayar, Dr KN Rao, Dr GM Berg, Dr Egger, Mr Garden Carter, Dr JB Srivastava, Dr SP Tripathy, Dr Stefan Grzybowski, Dr Karel Styblo, Dr F Polansky, Dr Johns Holm, Dr KL Hitze, Dr Olakowski, Dr Wallace Fox.

3.12. Disturbing developments

Two events deeply affected and touched the emotional chords of

NTI. The first was the untimely demise of Dr James O'Rourke in 1965. Dr O'Rourke joined NTI in October 1961 and was actively associated with the development of DTP in India. A pleasing and amiable personality, he donned the mantle of leadership of the WHO participation in NTI, from Mr Andersen in 1963. Till the day he died he worked for better deals for NTI under WHO and more effective functioning of DTCs. He died suddenly due to cardiac arrest. Dr D Savic took over from him as SMO. The second was a disturbing decision of a high powered, three member work study team under Mr TR Tiwari in September 1968. The work study team was instituted to review the functioning of NTI. Its recommendations on the technical functioning did not force major changes, but its administrative recommendations, especially with regard to cutting the staff strength of different technical cadres, had adverse consequences. The government which was eager on reducing costs did not comprehend the implications. There was also a ban on filling up posts falling vacant. Situated in the south, NTI

had no clout at all with Delhi. With proper persuasion, this could have been avoided. Retrenchment affected almost all technical sections. It was especially severe on EPS, transport and X-ray. Considering that promotions were non-existent in any cadre, the committee also recommended for a few promotional posts but these were too few.

There was also an additional problem. Recruitment rules for the technical cadres were ad-hoc and continued to be so. Perhaps when the NTI was established, the founders were in a hurry to start work and recruited the cadres on the basis of their earlier experience in TB work in UMTS or NDTC, as at that time qualified people were hard to get. The incumbents were chosen mostly on merit or experience and not on formal qualification required. This resulted in ad-hoc recruitment rules. As action was not initiated later to formalise or upgrade them to suit either job requirement or all India cadres, the staff continued to suffer despite excellent work in both research

and training.

In 1976, when the work study team's recommendations were implemented, neither the NTI nor the staff was satisfied. The NTI suffered additionally when posts of senior officers were also not filled up with the urgency warranted to fulfill the needs of the Institute. The staff discontentment rose with the result that the government had to send an expert committee headed by Mr Sharat Kumar to evaluate the situation and make suitable recommendations. But due to bureaucratic delays the committee's recommendations in upgrading the majority of technical posts were not implemented till 1986. When it was finally implemented, it again became a half-hearted affair. Only a few posts were created after abolishing some. Some posts could not be filled up because the recruitment rules continued to be ad-hoc. Many posts are still on temporary basis receiving annual renewal. This proved to be a major irritant resulting in loss of interest and commitment by the concerned staff in the coming years.

3.13. Memorabilia

Dr (Mrs) Prabha Jagota

Director

28-12-1998

My entry into the NTI, Bangalore, was in itself a memorable event. After waiting for three and a half years for my transfer, in 1975 during the emergency period when the GOI looked into my file and acceded to my request for transfer from Delhi to Bangalore and posted me to NTI, my happiness knew no bounds and I proceeded to meet the Director of this Institute. My first meeting with Dr Nagpaul was an explosive one. I thought of my clinical background amidst the drab settings of the Institute. From his facial expression, it was evident that the Director did not have a good opinion of me. I did not feel like working at NTI. Despite that, he made sure that I assumed charge the same day before leaving. During the course of the interview, on being asked for how long I intended to stay on the job, I replied that it was till the time I learnt all about Mycobacterium or till the time my husband would stay in Bangalore. In those days, my husband was working for a pharmaceutical company based in Bangalore. About 5-6 months after joining NTI, one day in the TCC meeting, the Director praised me for my good work and added that he had to change his opinion regarding female employees especially lady doctors. The experience I had gained from my earlier stint in Municipal Corporation of Delhi stood me in good stead in the field of public health and family planning. I also learnt new things with a lot of zeal. I was impressed with the team spirit and the complete freedom that I had. The Officer was free to choose between participating in training activities or doing research work. Due to the immense freedom I had at work, I was so deeply immersed in research and training activities that I lost track of the time; that very freedom enslaved me and 25-27 years of my service had passed without even realising. My attachment to Bangalore was so strong that my family started living like south Indians.

Dr Nagpaul was my source of inspiration. Even today he is a dynamic worker with the Indian TB Association. Several years later he disclosed to me that he was compelled to include me in the workforce of NTI, as at that time, more than half the posts of MOs were vacant. When I think of the long service I had rendered at this prestigious institution, I feel I was ordained to do so largely as a design of destiny.

संस्करण

डा. (श्रीमती) प्रभा जगोता
निदेशक

२७.१२.१९९८

राष्ट्रीय क्षयरोग संस्थान में प्रवेश होना अपने आप में मेरे लिए एक अविस्मरणीय घटना है। अपने ट्रांसफर हेतु साढ़े तीन साल इन्तजार करने के बाद सन् १९७५ में जब आपातकालीन स्थिति के दौरान मेरी फाइल खुली तो भारत सरकार ने मेरी दिल्ली से बेंगलूर के ट्रांसफर की याचिका मन्जूर करके एन.टी.आई. के लिए आर्डर भेजे।

मैं बहुत प्रसन्नचित होकर इस संस्थान के निदेशक महोदय से मिलने आई। डा. नागपाल से मेरी प्रथम भेंट के दौरान जो इन्टरव्यू हुआ वह काफी विस्फोटक रहा। एक तरफ मैं सोच रही थी कि कहाँ क्लिनिकल काम और कहाँ यह सार जैसी संस्थान। निदेशक महोदय के चेहरे से बराबर लग रहा था कि उनकी मेरे बारे में धारणा अच्छी नहीं है। मेरी भी इच्छा एन.टी.आई. में काम करने की नहीं रही। किन्तु इसके बावजूद उन्होंने मुझे उसी दिन कार्यभार ग्रहण करने के बाद ही आने दिया। इन्टरव्यू के दौरान उनके यह पूछे जाने पर कि मैं यहाँ कब तक काम करूँगी? मेरा उत्तर था, तब तक, जब तक माईकोबैक्टीरियम के बारे में जानकारी नहीं लेती अथवा जब तक मेरे पति यहाँ नौकरी पर हैं। उस समय मेरे पति अखिल भारतीय आयुर्विज्ञान संस्थान दिल्ली छोड़कर स्मिथ क्लिन फ्रन्च बेंगलूर में मेडिकल डायरेक्टर के पद पर सन् १९७२ से कार्यरत थे। एन.टी.आई. में कार्यभार सम्भालने के ५-६ महीने के बाद एक दिन टी.सी.सी. मीटिंग में निदेशक महोदय ने मेरे काम की प्रशंसा की तथा यह कह कर चौंका दिया कि मेरे काम को देखकर उन्होंने महिला कर्मचारियों के प्रति खास कर महिला डॉक्टरों के प्रति, अपनी धारणा बदल दी है। मैंने अपने पहले सेवा काल दिल्ली नगर निगम के परिवार कल्याण विभाग में काम करते समय जो अनुभव प्राप्त किया था उसका मैंने पूर्ण निष्ठा व लगन से यहाँ के शोध, फील्ड वर्क, ट्रेनिंग आदि में उपयोग किया व नया काम भी मन लगाकर सीखा। इसके अलावा एन.टी.आई. में काम करने की अद्भूत प्रणाली जो खास कर एक समूह के कार्य पर आधारित है मुझे बहुत भा गयी। दूसरी बात जो मुझे निराली लगी, वह थी यहाँ पर काम करने की पूर्ण स्वतंत्रता। ट्रेनिंग में भाग लेना है या शोध कार्य करना है? ऑफिसर स्वयं चुन सकता था। धीरे-धीरे पूर्ण स्वतंत्रता के कारण शोध कार्य व ट्रेनिंग दोनों में इतनी व्यस्त हो गयी कि मुझे वही स्वतंत्रता समय की कब गुलाम बना गई, और सेवाकाल के २५-२७ वर्ष यहाँ कैसे व्यतीत हो गये पता भी नहीं चला। बेंगलूर से मेरा रिश्ता इतना अटूट रहा कि हम परिवार जन दक्षिण भारत वासी बन कर ही रह गये।

महोदय डा. नागपाल तो तब भी मेरी प्रेरणा के स्रोत थे और आज भी हैं। वह इन दिनों भी भारतीय क्षयरोग संगठन में सक्रिय रूप से कार्यरत हैं। उन्होंने मुझे कई साल बाद यह राज बताया कि उस दिन मुझे कार्यभार ग्रहण कराने की उनकी मजबूरी थी, क्योंकि उस समय एन.टी.आई. में आधी से ज्यादा मेडिकल ऑफिसरों की पोस्टें खाली थी। इतनी गौरवशाली संस्थान में इतने लम्बे समय तक कार्य करने का सौभाग्य प्राप्त हुआ, आज यह सोचती हूँ तो लगता है हमारे जीवन में काफी कुछ विधि के विधान के निहित ही घटित होता है।

Mr Simeon Ratnadurai

former Laboratory Technician 1994

The building was inadequate to house the laboratory. The rooms were meant for some other purposes. For e.g., there was a huge grinding stone in one room, which happened to be a kitchen. This was so heavy it could not be shifted! So we chose to dig a pit, bury this grinding stone and re-lay the floor! We had to plan for the cold room, incubation room, sterilisation room and many other rooms to cater to special facilities. Equipment came from all over. With Dr K Padmanabha Rao, Mr Cobbold and Dr Nassau in the lead, we re-ordered the rooms, unpacked, installed the equipment. In March 1961, after eight months of grinding work, our laboratory became fully operational, except for the cold room. In place of the cold room, we used four huge Philco refrigerators.

We had to innovate as we went along. For e.g., the inspissator, which is used for cooking the media, was not available. We also used a type of water bath so as to obtain a determined texture of the media. We needed racks to array and keep literally hundreds of McCartney bottles, so that reading, fetching, etc., would be easy. We put our heads together, designed and got them done locally. We had to devise sputum boxes, which are used to transport tightly packed and ice protected sputum specimen from field to the distant laboratory, fully protected from jerks and jolts of a bumpy ride. We had other problems. We found the contamination rates very high. We checked every step of the procedure and finally identified that few water drops trapped in between the metal undersurface and rubber lining of the McCartney bottle caps. It was obvious that in this place, the sterilisation process was somehow incomplete. So we separated the rubber lining from the metal cap, washed, dried and sterilised them separately, then refitted them into the caps and sent them for sterilisation again. With this we were able to check avoidable contamination. Such operations finally led us to standardise many procedures in the laboratory, which we now adopt as a matter of course.

Previously the concept was to collect 24 hour sputum specimen. We found that the results were good enough if the specimen collection was made on the spot. However, the sputum collector has a special responsibility. The patient's posture while standing must be that he should place his arms on his hips while coughing to bring out the sputum. The collection must be done in shade and the sputum collector must have wind blowing away from him. I feel that the work done in the NTI laboratory is of high quality. For e.g., to prepare media, we do not buy eggs from the local market. A vehicle will go to Hesaraghatta, 26 miles away, where only fresh eggs are procured and brought for use in the media. The facilities are very good, as befitting a national laboratory.

Dr. Sujatha Chandrasekaran

former CMO

On 31.1.1995, Mr Simeon Ratnadurai retired from services. Here is what the head of section spoke of him at the felicitation function:

I feel honoured to work along with Mr Simeon Ratnadurai; so dignified he was; so unassuming. He never demanded anything for extra work or special tasks done... He knew all the machines in the laboratory and maintained them so well. There are some even now in running condition, some 30 years after commissioning! The machines will not forget him.

डा. सुजाता चन्द्रशेखरन

पूर्व मुख्य चिकित्साधिकारी

१९९५

३१ जनवरी सन् १९९५ को श्री. सिमियन रत्ना दुराई सेवा निवृत्त हुए । उनके विदाई समारोह में उनके विभागाध्यक्ष ने कहा, मैं सम्मान का अनुभव करती हूँ कि मैंने दुराई के साथ कार्य किया । श्री. दुराई अत्यन्त सम्माननीय व्यक्तित्व के थे जिन्होंने कभी भी अतिरिक्त कार्य के लिए कोई अतिरिक्त धन की मांग नहीं की । वह प्रयोगशाला की सभी मशीनों से भली भाँति परिचित थे तथा उसका अच्छा रख रखाव भी करते थे , इसलिए ३० वर्ष बाद भी मशीनों में से कुछ कार्य करने योग्य हैं । मशीनें उन्हें कभी भी नहीं भूलेंगी ।

श्री. सिमियन रत्नादुराई

भूतपूर्व प्रयोगशाला प्रविधिज्ञ १९९४

भवन प्रयोगशाला के लिए अपर्याप्त था । कमरे किसी और कार्य कि लिए बनाए गये थे जैसे एक कमरे में बहुत बड़ा पीसने का पत्थर लगा था था कमरा रसोई जैसा प्रतीत होता था । पत्थर इतना भारी था कि हटाना संभव न था । अतः उसे एक गड्ढा खोदकर दबाना पड़ा और कमरे को कार्य हेतु बना लिया गया । शीतकक्ष, इनक्यूवेशन कक्ष, विषक्रमण कक्ष आदि विशेष कार्य हेतु तैयार किया गया । कई उपकरण भी लाए गए । डा. के. पदमनाभा राव, श्री. कोबोल्ड एवं डा. नास्सू के नेतृत्व में हम लोगों ने उपकरणों को खोला और पुनर्रयोजित कक्षों में स्थापित कर दिया । मार्च १९६१ और बाद के ८ माह में अथक परिश्रम के बाद हमारी प्रयोगशाला (शीत कक्ष छोड़कर) पूर्ण रूप से कार्यशील हो गयी । शीत कक्ष के स्थान पर हम लोग ४ बहुत बड़े पिल्को शीत उपकरणों का प्रयोग करते थे । हम लोग यन्त्रों की कमियों को पूरा करने के लिये खोज करते रहते थे । उन दिनों इन्सुपीसेटर जो मीडिया पकाने में प्रयोग होता है उपलब्ध नहीं था । हम लोग एक प्रकार का वाटर बाथ भी मीडिया प्राप्त करने के लिए प्रयोग करते थे । हमें सैकड़ों मैककार्टनी बोतलों को रखने के लिए रैकों की आवश्यकता थी, जिससे रीडिंग आसानी से ली जा सके । हम सभी ने मिलकर सोचा और इसे स्थानीय व्यवस्था पर बनवाया । हमें बलगम रखने हेतु डिब्बों की खोज करनी पड़ी जिन्हे बर्फ में रखकर बलगम के नमूनों को क्षेत्र से दूरस्थ स्थानों में स्थित प्रयोगशालाओं में भेजा जा सके और ऊँचे नीचे झटको वाले रास्ते में खराब न हो । हमने यह भी पाया कि दूषितीकरण की दर अधिक थी । हमने प्रक्रिया को परखा और पाया कि मैककार्टनी बोतल के ढक्कन की रबड़ की पर्त के बीच में आने वाली पानी की बूँदे इसका कारण थी । यह स्पष्ट था कि विषक्रमण की प्रक्रिया अधूरी है । अतः हमने रबड़ को हटाया धातुकप को धोया, सूखाया ओर पूनः विषक्रमित किया । इस प्रकार अकारण आने वाले दूषितीकरण को समाप्त करने में सफल हो सके ।

पहले यह धारणा थी कि २४ घन्टे का बलगम नमूना एकत्र किया जाए । हमने यह पाया कि यदि मौके पर ही नमूना एकत्र किया जाए तो भी परिणाम अच्छे आ सकते हैं । हालाँकि बलगम एकत्र करने वाले के लिए विशेष दायित्व की आवश्यकता होती है , जैसे बलगम निकालते समय रोगी के दोनो हाथ कूल्हों पर हों , बलगम खुली हवा में एकत्र किया जाए तथा हवा का प्रवाह बलगम निकालने वाले व्यक्ति की दूसरी दिशा में हो । मैं महसूस करता हूँ कि राष्ट्रीय क्षयरोग प्रयोगशाला का कार्य उच्चकोटि का है । उदाहरणार्थ मीडिया बनाने हेतु हम लोग स्थानीय बाजार से अंडे नहीं खरीदते थे , बल्कि २६ मील दूर हैसरगटा से ताजे अंडे एक वाहन द्वारा मंगाए जाते थे । राष्ट्रीय स्तर की प्रयोगशाला हेतु यहां बहुत अच्छी सुविधाएँ हैं ।

Sri C Satyanarayana

former Statistical Assistant

26 & 27.1.1998

Initially, Dr Gothi was in-charge of the new Stat section. But, Dr Nagpaul was always there to guide the section. In 1966, when we went to Hyderabad to start the STC, he supported all of us. Through him we learnt every working line of the STC Manual and could give guidelines to state officers to carry out all tasks. If they implemented the tasks as guided, that STO could independently guide all the DTCs for the state just like the NTI. Dr Nagpaul was a great teacher... He would want everyone to grow. He made us understand that SRC is not a mere statistics gathering section. It is the real next step to training. We would be in touch with the state, the DTC and the centre. The SRC was fully operational when Dr Arora joined. He took guidance from Dr Nagpaul, understood the idea and the ideals.... trained himself and his staff thoroughly. He read all pages of every report from the DTCs personally and sent constructive comments to the respective DTCs rapidly. Our travel budget was small; so he carefully planned visits to cover vast areas economically and especially covered inefficient DTCs to boost up performance. During his visit, he went to every table in the DTC, met everyone and held discussions. He made note of all deviations, made a list for further consideration... All these voluminous notes came in handy when the manuals were revised in 1978...

Dr Nagpaul was a visionary. He wanted to have five regional centres for India. Problem solving would be rapid. He wrote to Delhi many times to create these regional centres... But, nothing came of it. We thought the regional centres would assist NTI in creating a better atmosphere for supervision. Till we, at the SRC, were taking action constantly, the NTP was functioning fairly well in the southern region. Once we stopped that the efficiency levels started declining. He gifted his Padmashree award to the NTI. He was truly a great leader. All the functioning DTCs of that time

had some problem or the other: no posting, no drugs, no vehicle, etc. Dr Arora listened, he wrote down everything. Some times there would be peculiar problems.

The SRC had complex functions. There were so many variations possible in different DTCs and states... It was like a research team with one leader and 20 workers. We could not order DTCs to function as research teams.... Situations were different. To have a uniform system throughout India, was not an easy task. Same is true today. The NRC in Delhi was not functioning like the SRC. Once Dr NK Menon, TB Adviser told us, we can use your reports for many scientific analysis...

I consider Dr Arora to be a 'Karma Yogi'. When both regional centres at Delhi and Bangalore were abolished, NTI was asked to do the monitoring of the whole country. We started getting the reports from all over the country. He perused every report and wrote his comments...He retired and others could not handle the work load... It then became a routine proforma reply. This is a great setback because the reports are really vital for the programme.. Somehow I feel the philosophy at NTI has also changed in the years...

श्री. सी.सत्यनारायना

भूतपूर्व सांख्यिकीयक सहायक

२७.१.१९९८

आरम्भ में डा. गोठी नए सांख्यिकी अनुभाग के इनर्चार्ज थे । परन्तु डा.नागपाल वहाँ पथप्रदर्शक के लिये सदैव व उपस्थित रहते । सन् १९६६ में हम एस.टी.सी. को आरम्भ करने के लिए हैदराबाद गये उन्होंने हम सबको समर्थन दिया । उनके द्वारा हमने एस.टी.सी. मैनवल की कार्य प्रणाली को सीखा और प्रान्तीय अधिकारियों का मार्ग दर्शन किया ताकि प्रान्तीय क्षयरोग अधिकारी राष्ट्रीय क्षयरोग संस्थान की तरह प्रत्येक जिला क्षय रोग केन्द्र का मार्ग दर्शन करे । निर्देश भेजें डा.नागपाल एक महान अध्यापक थे । वह प्रत्येक को बढ़ता हुआ देखना चाहते थे । हमें यह अहसास कराया कि सर्जन रीजनल सेन्टर सिर्फ (एस.आर.सी.) एक सांख्यिकी अनुभाग नहीं हैं बल्कि यह प्रशिक्षण का अगला कदम है । हमें प्रान्त, जिला क्षयरोग केन्द्रों तथा राज्य केन्द्र के सम्पर्क में रहना पड़ता था । डा.अरोरा के एस.आर.सी. का कार्यभार सम्भालने से पूरी तरह से आपरेशनल हो गया । उन्होंने डा.नागपाल से मार्गदर्शनकारी निर्देश लिए, अपने को प्रायोजित किया तथा अपने स्टाफ को प्रशिक्षण दिया । उन्होंने व्यक्तिगत रूप से जिला क्षयरोग केन्द्रों की रिपोर्ट के प्रत्येक पेज को पढ़ा और प्रत्येक क्षयरोग केन्द्रों को रचनात्मक टिप्पणी दी । हमारा यात्रा भत्ता बहुत कम था । इसलिए उन्होंने अच्छा कार्य करने के लिए सावधानी पूर्वक मुख्य कार्यक्रम बनाया जिससे कम खर्च में अधिक केन्द्रों का भ्रमण किया जा सके । निरीक्षण के दौरान वह जिला क्षयरोग केन्द्रों की प्रत्येक मेज तक गये तथा प्रत्येक से मिलकर विचार विमर्श किया । हर कमी को लिखा तथा पुनःविचार हेतु उनको सूचीबद्ध किया । सन् १९७८ में जब मैनुअल संशोधित हुआ तो यह सभी टिप्पणी बहुत कारगर साबित हुई।

डा.नागपाल दूरदर्शी थे । वह भारत के लिए पाँच क्षेत्रीय केन्द्र चाहते थे । जिससे समस्या समाधान जल्दी होगा। इन केन्द्रों को बनाने हेतु उन्होंने कई बार दिल्ली को लिखा । परन्तु इसके कुछ परिणाम नहीं निकले। हम सोचते थे कि क्षेत्रीय केन्द्रों से राष्ट्रीय क्षयरोग संस्थान को सुपरविजन का अनुकूल वातावरण बनाने में सहायता प्राप्त होगी। हम जबतक एस.आर.सी. में लगातार उचित कदम उठाते रहे दक्षिण भारत में एन.टी.पी. भलीभाँती चलता रहा और जब एस.आर.सी.बन्द हो गया तो कार्यक्रम की क्षमता भी नीचे गिरने लगी तो उच्च स्तर का कार्य प्राप्त नहीं हुआ । उन्होंने अपने पद्मश्री पुरस्कार को भी राष्ट्रीय क्षयरोग संस्थान को भेंट किया । वह वास्तव में एक महान नेता थे ।

उस समय कार्य कर रहे सभी जिला क्षय रोग केन्द्रों की कुध न कुछ समस्याएँ थी

। स्टाफ नहीं था, औषधियाँ तथा वाहन का अभाव था । डा. अरोरा ने प्रत्येक को नोट किया ।

एस.आर.सी.के कार्य बहुत गहन थे । जितने राज्य व जिला क्षय केन्द्र उतनी ही विभिन्नताएँ ! यह एक रिसर्च दल की तरह था जिसमें २० कार्यकर्ता तथा एक मुखिया हो । जिला क्षयरोग केन्द्रों को रिसर्च टीम की तरह कार्य करने का आदेश नहीं दिया जा सकता था । स्थितियाँ विभिन्न थी। पूरे भारत में एक जैसा कार्य करवाना कोई आसान कार्य नहीं था आज भी । यह सच है । दिल्ली में नार्दन रीजनल सेन्टर (एन.आर.सी.), एस.आर.सी. की भाँति कार्य नहीं कर पा रहा था। एक बार डा.एन.के. मेनन, क्षयरोग सलाहकार जो उस समय दिल्ली में पद नियुक्त थे, ने मुझसे कहा कि हम तुम्हारी रिपोर्ट को वैज्ञानिक विश्लेषण के लिए प्रयोग कर सकते हैं । मैं डा.अरोडा को एक कर्मयोगी की उपाधि देता हूँ । जब दिल्ली व बेंगलूर के दोनों क्षेत्रीय केन्द्रों को बंद कर दिया गया तो पूरे देश की मॉनिटरिंग का कार्य राष्ट्रीय क्षयरोग संस्थान को सौंपा गया और पूरे देश से रिपोर्ट आने लगी । वह हर रिपोर्ट को पढ़ते व अपनी टिप्पणी भेजते । जब वे सेवानिवृत्त हुए तो उस कार्यभार को संभालना कठिन हो गया था क्योंकि हर एक इतने विस्तार काम को न सम्भाल सके उसके बाद टिप्पणी एक आम प्रोफोर्मा में जाने लगी । यह प्रोग्राम के लिये बहुत बड़ा धक्का है क्यों कि रिपोर्ट प्रोग्राम की जान हैं । यह एक बहुत बड़ी कमी है कि ऐसे कार्यक्रमों की रिपोर्ट बहुत विस्वृत होती हैं ।

मुझे लगता है कि संस्थान की फिलौसफी ही भी बदल गई हैं

X-ray Technicians (46th training course 1982)



Sitting : P.K. Nair, D.E. Johnson, P. Chandrasekhar, R. Narasimha
rao, B.R. Ballal, E. Ramasamy, P.S. Ramamurthy, A.T.A. Rao

Standing : A. Khader (Karnataka), S. Mazumdar (Assam), G.P. Varma
(M.P.), M.L. Bhandari (J. & K.), N. Rajagopal (T.N.), K. Shereef
(Karnataka), R.C. Garg (H.P.), A. Barik (M.P.)

*III International & 63rd regular DTP training course
14th January to 22nd March 1991*



- Sitting Floor L to R : Mr. S.K. Mishra (U.P.), Mr. S. Kanagavelu (T.N.), Mr. P. Linga Raju (A.P.) Mr. M.M. Sadiq (J & K), Mr.R.S. Chauhan (U.P.), Mr. J. Raja Thinagaran (T.N.), Mr. M. Thangavelu (T.N.), Mr. V.D. masta (Kar)
- Sitting L to R : Mr. Z. Joseph (NTI), Mr J.A. Steaphen (NTI) Dr. V.K. Challu (NTI), Mr. M.M. Chauhan (NTI), Dr. V.H. Balasangameshwara (NTI), Dr. K. Chaudhuri (Director, NTI), Dr. (Miss) Samiha Bhagdadi (WHO-Syria), Dr. (Mrs) Maria-Da-Gloria (WHO-Mozambique), Dr. (Mrs) Sujatha (NTI) Dr. B. Mahadev (NTI), Dr. J.L. Jain (M.P.), Dr. Mir Azizullah Akghar (WHO-Afganisthan) Mr. Rajan Mathew (NTI)
- 1st Standing L to R : Mr. S. Sathyanarayana (A.P.), Mr. S.N. Reddy (A.P.), Mrs. S. Kousalya (T.N.), Mrs. Usha Kumari (Punjab), Mrs. E. Victor (NTI), Mrs. V.N. Saroja (NTI) Mrs. C. Rajamani (T.N.), Mrs. A. Korah (NTI) Miss. Mezhulhunono (Nagaland), Dr. K.N. Patni (U.P.) Mr. Bhaskar Chari (Karnataka), Mr. N.L. Narasimhaiah (Kar), Mr. G. Prabhakara Rao (A.P.), Mr. V.V. Dwivedi (M.P.) Dr. Ali Hamid Khaled Altalhi (WHO-Saudi Arab) Mr. D.P. Chaudhury (W.B.), Mr. Prakash Chand Duggar (Punjab)
- 2nd Standing L to R : Dr. F.A. Khan (U.P.) Dr. S.K. Sil (W.B.), Dr. D.P. Sharma (M.P.) Mr. I.A. Gogi (Karnataka)
- 3rd Standing L to R : Mr. G. Rajaram (A.P), Mr. R.M. Bindhnai (Orissa), Mr. M.H. Khan (U.P.) C. Bhadre Gowda (Karnataka), Mr. D.B. Rudrappa (Karnataka), Mr. C.K. Deshpande (A.P.), Mr. V.S. Bhaskara Rao (A.P.) Mr. D.P. Kurwade (Maharashtra), Mr. V.K. Sumant (Maharashtra) Dr. V.D. Murugesan (T.N.), Dr. Indirjit Aggarwal (Punjab), Dr. Ashok Shukla (U.P.) Dr. S.P. Burma (A & N Island), Dr. G.G. Kulkarni (Maharashtra) Mr. M. Balakrishnan (WHO-Malaysia), Dr. R. Lalthanga (Mizoram) Mr. Nagaraj (NTI), Mr. V. Thimmarayappa (NTI), Mr. Udhiya Kumar (NTI)