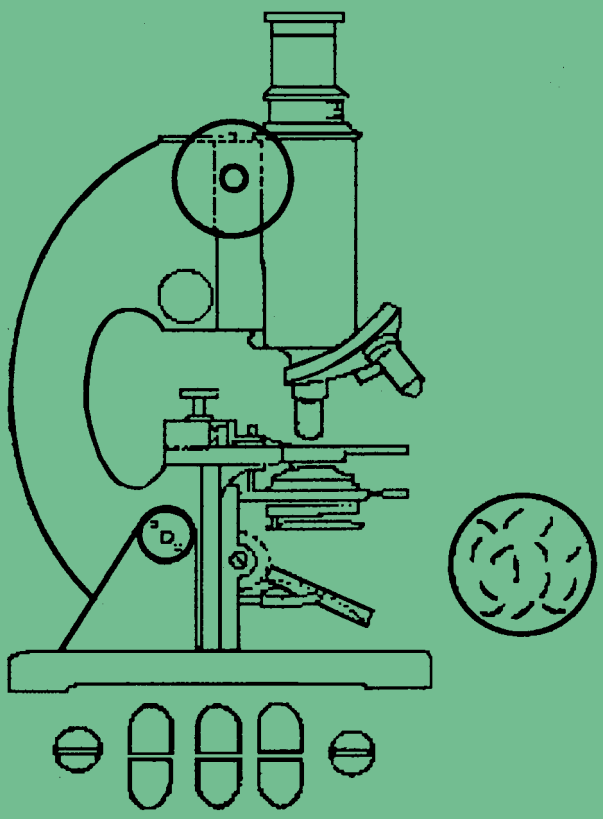
Website : http://ntiindia.kar.nic.in

ISSN No. 0047-9136

VOL. 38/1&2
JANUARY - JUNE 2002

NTI BULLETIN



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NATIONAL TUBERCULOSIS INSTITUTE
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Printers	:	Shiva Shankar Printers, Bangalore - 27.
Number of copies printed	:	1,000

INTERNATIONAL STANDARD SERIAL NUMBER
ISSN 0047 - 9136

e-mail	**:**	**ntiindia@blr.vsnl.net.in**
Website	**:**	**http://ntiindia.kar.nic.in**
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The "NTI Bulletin" is indexed by the (i) "ULRICH's International Periodical Directory", published by the RR Bowker Publishing Company (A Xerox Corporation) New York & London (ii) "Directory of Indian Scientific Periodicals" published by the INSDOC, New Delhi 110 067 (iii) "Regional Union Catalogue of Scientific Serials".

Editorial

The Tuberculosis (TB) Control Programme has been in existence in our country for four decades. The doyens of TB control in our country while formulating the TB Control Programme, formulated it on very sound technical basis, which was flawless. A review of the Programme in 1992 also concluded that it was not the technical basis but lack of managerial skills and other operational problems, which lead to the poor performance of the programme. Dr VK Chadha in his article on the technical basis of Revised National Tuberculosis Control Programme (RNTCP) has dealt in the form of Frequently Asked Questions, various aspects of the disease and the control programme from General Information, Symptoms, Diagnosis, Chemotherapy etc., to Evaluation.

It is a well-known fact that agricultural workers are more at risk in suffering from Respiratory diseases and more so from TB due to their poor nutritional status and poor housing conditions. These facts are highlighted in the article "Tuberculosis among agricultural workers and its control" by Dr VK Chadha and Dr P Jagota.

Management Information Systems play a crucial role in disease control. Prompt information on disease outbreak is very important for its containment and control. Health InterNetwork India has taken on the ambitious project of using Internet for Health Management Information Systems. As the recording and reporting system in TB being quite well established, TB is chosen for the pilot project. This Institute is actively involved in this project and update of the "Health InterNetwork India - Pilot Project - Tuberculosis" for the period January - June 2002, gives the details of the conception and implementation of the pilot project.

Implementation status and performance of RNTCP in India during the

decade 1993-2002 has been presented in an article by Sri KP Unnikrishnan and his team. Current status of the Survey to Estimate Annual Risk of TB Infection in different parts of India and also the current status of Drug Resistance Surveillance in Mayurbhanj, Hoogli and Nagaon are presented. Information on training and supervisory activities in the quarter January-June 2002 are also presented in this issue.

The other highlights of the issue include field experiences of Mr. Lakshminarayana, musings by Dr Chitra Nagaraj, Abstracts by Mrs SR Kusuma and Administrative News.

Happy Reading.

Editor.

NTI Bulletin 2002, 38/1&2, 3-10

TECHNICAL BASIS OF REVISED NATIONAL TUBERCULOSIS CONTROL PROGRAMME

VK Chadha*

The Directly Observed Treatment Short-course (DOTS) strategy adopted in the Revised National Tuberculosis Control Programme (RNTCP) has shown promise especially in increasing cure rates of infectious Tuberculosis (TB) cases. About half of the country has already been covered with RNTCP and the remaining half is expected to be covered in another five years. This article is intended to elucidate the technical basis for different operational aspects of RNTCP viz. case finding and treatment strategies, the necessity of Direct Observation of Treatment (DOT), follow up procedures and the policy of chemoprohylaxis. The article has been written in the form of answers to questions frequently encountered during the course of various training programmes, workshops and other interactive sessions with TB workers. The information has been compiled after extensive review of a very large number of articles and scientific material. Efforts have been made to keep the article concise and easily comprehensible. It is expected to benefit the TB programme managers as well as physicians to better appreciate the technical basis of RNTCP.

GENERAL INFORMATION

Q 1. What is the projected scenario of tuberculosis in our country?

Ans: Demographic changes like increasing life expectancy, population growth, deterioration of living conditions in urban areas like over-crowding and epidemiological factors like advent of HIV epidemic are expected to increase the incidence of TB, unless TB control efforts are intensified on a war footing. Poor treatment practices, if continued, may contribute to emergence of an epidemic of Multi-Drug Resistant TB (MDR-TB) making the disease virtually incurable.

Fortunately, the 'DOTS strategy' now being expanded in the country has shown promise in terms of cure of infectious cases and hopes of its control have been aroused provided the strategy is implemented with full vigour.

Q 2. Why is priority given to detection and cure of sputum smear positive cases?

Ans: Sputum smear positive cases of pulmonary TB are the main sources of transmission of infection. They are responsible for almost 95% of the transmission of infection in the community. They also suffer from more extensive disease and thus are at higher risk of dying. If not treated properly they become the sources of drug resistant bacilli.

SYMPTOMS

Q 3. What is the rationale for three weeks cough as the primary symptom of pulmonary TB?

Ans: About 84% of smear positive cases attending health institutions can be detected by screening of chest symptomatics of $\geq$3 weeks cough alone, as revealed in operational research studies. Subjecting patients with cough of less than 3 weeks or those with other chest symptoms to sputum smear microscopy may increase the workload of laboratory by almost three times while adding little to the case yield.

DIAGNOSIS

Q 4. What is the rationale of collecting three specimens for sputum microscopy?

Ans: Of the total smear positive cases presenting at health institutions, about 69% can be detected by smear examination of first sputum specimen and another 20% by examination of second specimen. The additional case yield by subsequent specimen is minimal. Therefore, a minimum of two specimens should be examined for obtaining acceptable sensitivity of smear microscopy as a case finding tool.

Further, there is likelihood, albeit small, of single positive sputum smears result to be false positive.

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However, the chances of two positive results to be false positive are practically non-existent. Therefore, the criteria of at least two smear positive results to label a case as smear positive increases the specificity of the test. Since the bacilli are not excreted consistently in all specimens, at least three specimens should be examined to satisfy the above criterion.

Q 5. Why should we examine at least 200 oil-immersion fields to declare a sputum smear as negative?

Ans: A sputum smear is spread over an area of 200 mm^2 and contains about 0.01 ml of the specimen. Each oil-immersion field has an area of 0.02 mm^2. Therefore, there are 10,000 fields on the slide. If a specimen contains 5000 bacilli/ml, there will be 50 bacilli distributed over entire smear and one bacillus over 200 fields. Considering that the bacilli are not distributed evenly over the smear, there must be at least 10,000 bacilli/ml to detect one bacillus over 200 fields.

Q 6. What precautions are needed to reduce false positive sputum smear results?

Ans:(i) Rinse mouth before sputum collection or collect specimen before food.

(ii) Use separate wooden stick for each smear preparation and stain each slide separately on a rack.

(iii) Use new slides. The scratches on the slide can be differentiated as these occur in parallel rows and are found deeper.

(iv) Use fresh stains and preferably filter the stains before use.

(v) Preferably, use distilled water to avoid false positive result from environmental mycobacteria.

(vi) Do not allow the objective of the microscope or the oil dropper to touch the slide.

(vii)Clean lens with a lens cleaning paper (not cotton) after examination of each slide.

Q 7. What are common reasons of false negative results?

Ans:(i) Improper guidance to the patient resulting in poor quality of the sputum sample is the most common reason of a false negative result.

(ii) Bacilli may loose acid fastness if exposed to excessive heat (over heating while fixing the slide), direct sunlight, or long period of storage in hot and humid conditions.

(iii) Smear not prepared from blobs that contain dead caseous tissue discharged from cavity.

(iv) Too thin or too thick smear

(v) Improper fixing

(vi) Too short Carbol-Fuchsin staining or boiling it

(vii) Intensive counter staining

(viii) Erratic and brief examination

(ix) Administrative errors

Q 8. What is the role of X-ray in RNTCP?

Ans: Chest X-ray has a role in differential diagnosis of pulmonary disease among chest symptomatic patients whose sputa are consistently negative on smear microscopy.

Q 9. Is it possible to detect cases early by X-ray or culture?

Ans: Smear positive cases do not necessarily pass through an early smear negative stage and only a few smear positive cases would be prevented by use of additional more sensitive methods for detecting pulmonary TB cases, which will also shift priority from detecting and treating most infectious cases.

Q 10. What is the role of culture?

Ans: A cavity of 2-cm diameter contains about 100 million organisms, easily detected by sputum smear microscopy. Almost the same number of new cases can be detected by the first two smears as by first culture examination. Therefore, the additional yield of cases by culture is small. Only nodular lesions discharging small amounts of bacilli are negative by microscopy. Moreover, only-culture positive TB cases (negative on microscopy) discharge bacilli intermittently, compared to smear positive cases, which discharge bacilli more consistently.

Nevertheless, culture has a role in drug sensitivity tests, diagnosis of extra-pulmonary TB like lymph node TB and for differential diagnosis in a few cases after carefully evaluating microscopy and radiology.

Q 11. Why are there so many grades of microscopy while treatment does not change with grading?

Ans: Grading assists in quality control and also saves time since fewer fields have to be examined for higher grades. It also assists in monitoring prognosis during course of treatment. A higher proportion of cases with 2+ and 3+ smears are likely to remain positive at the end of intensive phase and may require additional one month of intensive phase.

Q 12. Why should the grading vary from one sample to another in the same patient?

Ans: Bacilli are not evenly distributed in a specimen but are found in clumps. (Specimens consistently positive contain at least 10^5 to 10^6 bacilli per ml.)

Q 13. What should be done if the result of smear microscopy is scanty positive among chest symptomatics?

Ans: A scanty positive smear result should be supported by another positive smear (more than scanty positive) or by suggestive chest X-ray. Otherwise, repeat sputum collection and smear examination is preferable.

Q 14. Why is it important to examine smear within a week of its preparation?

Ans: In hot and humid conditions, the bacilli seem to loose their acid-fastness. Even the stained bacilli may loose the stain by osmosis in such climates. The slides labeled positive for Acid Fast Bacilli (AFB) by Laboratory Technician (LT) but negative by Senior Tuberculous Laboratory Supervisors (STLS) should be re-stained.

Q 15. It has been observed that false negatives are more common in sputum microscopy. On the other hand, only 10% random sample of negative slides is crosschecked in RNTCP?

Ans: The purpose of cross checking is to identify laboratory technicians who require retraining rather than identification of individual slide errors.

Q 16. What is the role of newer diagnostic tests?

Ans: (i) Serological tests have poor sensitivity and specificity. The sensitivity of the test is highest in patients with smear positive disease and much lower among TB cases not detectable by smear microscopy viz. sputum smear negative cases of pulmonary TB, extra-pulmonary TB, children diagnosed with TB and HIV infected TB cases. Also, these tests do not reliably distinguish active TB from dormant infection.

(ii) Amplification tests e.g. Polymerase Chain Reaction (PCR) are 95% sensitive in smear positive cases and only 50% sensitive in smear negative and culture positive cases. Though specificity is high, it is lower under field conditions. In addition, inability to distinguish viable from dead bacilli and high cost dissuade their use in developing countries.

(iii) The Assay of cell-mediated immunity is highly complex.

Q 17. What are the causes for a specimen to be smear positive but negative on culture?

Ans:(i) False positive smear result

(ii) Bacilli might have lost ability to grow in culture due to the following reasons:
- Bacilli killed or harmed by treatment
- Exposure to heat and sunlight
- Long storage of sputum specimen
- Excessive decontamination procedures while processing the specimen for culture

Q 18. Why a cut off point of one month is considered for labeling a patient as a new case?

Ans: Patients with history of treatment of less than one month have been found to respond similarly, as those never treated before. Also, the chances of development of drug resistance with less than one month therapy are remote.

Q 19. Is there a higher incidence of TB among contacts? What is the role of contact tracing under RNTCP?

Ans: Though relative risk of acquiring infection and developing TB is higher among contacts, the case

yield from contact tracing is low. However, the risk of breakdown is maximum during the period immediately following infection, especially among children. Therefore, all child contacts and symptomatic adult contacts of smear positive cases, irrespective of the duration of symptoms should be examined at the health centre, to identify and treat TB cases and to provide preventive treatment to children.

CHEMOTHERAPY / TREATMENT ACTIVITIES

Q 20. Why is it necessary to directly observe treatment?

Ans: At least one third of patients receiving self-administered treatment do not adhere to treatment. It is impossible to predict which patients will take medicines regularly. Therefore, directly observed treatment is necessary at least in the initial phase of treatment to ensure adherence and achieve sputum smear conversion. A TB patient missing even one attendance can be traced immediately and counseled. No method other than directly observed treatment has been able to achieve 85% cure rate of new smear positive cases.

Q 21. What is lag period and its use?

Ans: The tubercle bacilli when exposed to a drug do not multiply for varying duration, which is called lag period. This property of the bacilli is utilized as the basis of intermittent therapy.

Q 22. What is the basis of drug regimens?

Ans: Drug regimens are decided in consideration of the following aspects:

(i) Mode of action of individual drugs
(ii) The dose of each drug depends on minimum inhibitory concentration (MIC) i.e. the minimum drug concentration that inhibits bacterial growth in-vitro, and
(iii) Minimum Bactericidal Concentration (MBC) i.e. the concentration at which bacteria are killed. MBC is usually higher than MIC.
(iv) Prevention of drug resistance.
(v) Demonstrated efficacy during drug trials and field trials in terms of treatment success and relapse.
(vi) Minimal side effects.
(vii) Cost effectiveness.
(viii) Operational feasibility.

Q 23. What are the roles of individual drugs during intensive phase?

Ans: Isoniazid (INH) has very high early bactericidal activity (EBA) and acts on rapidly multiplying extra-cellular bacilli. It accounts for 95% kill in bacillary population. Remaining bacilli metabolize slowly and are killed preferentially by 'Rifampicin'. INH is also the most effective drug for preventing resistance to other drugs. On the other hand, other drugs are not so efficient in preventing resistance to INH, which is therefore more common.

Rifampicin also has high bactericidal activity but starts acting little later. It acts on rapidly as well as intermittently (found in caseous lesions) multiplying bacilli.

Pyrazinamide acts on intra-cellular bacilli that are particularly inhibited by acid environment inside macrophages. Ethambutol is the companion drug to prevent drug resistance.

Q 24. What is the role of INH and Rifampicin during Continuation Phase?

Ans: Rifampicin is the main sterilizing drug in this phase. The role of INH is mainly to prevent drug resistance to Rifampicin.

Q 25. Why Pyrazinamide or Ethambutol is not included in Continuation phase of Cat I?

Ans: Pyrazinamide has no additional benefit if given beyond 2-3 months, as seen in clinical trials. Ethambutol is not required because the chances for development drug resistance to INH or Rifampicin in the continuation phase are negligible as the number of bacilli is drastically reduced in this phase.

Q 26. Why Cat II cannot be given for serious extra-pulmonary cases like TBM?

Ans: Streptomycin, the additional drug has limited penetration to membranes. However it can be given intra-thecal in case of serious cases of TBM.

Q 27. Why 3 drugs are given during Continuation Phase of Cat II?

Ans: The re-treatment cases are more likely to harbor drug resistant bacilli, at least to INH.

Therefore, ethambutol is added to prevent drug resistance to INH or Rifampicin.

Q 28. Why only 3 drugs are given during Intensive Phase of Cat III?

Ans: Smear negativity means there are less number of bacilli and thus negligible chances of resistant mutant bacilli being present.

Q 29. Why does treatment fail?

Ans: The most common reason of treatment inability is the failure to observe drug administration, which results in treatment failure.

Q 30. What are the special precautions to protect Rifampicin?

Ans: Rifampicin should be protected since resistance to it results in much higher failure and relapse rates. Cross-resistance also occurs to all other Rifamycins. It should never be used without direct observation. Its use should preferably be restricted to public health institutions and experts. The regimens, which minimize risk of resistance to Rifampicin, should only be used.

Q 31. Why should we check sputum smear status at 2/3 months?

Ans: This information is essential for prolongation of intensive phase to reduce the risk of failure and relapse.

It is an important management tool and reflects the quality of lab, and treatment observation during Intensive Phase and proportion of defaulters.

The smear status at the end of Intensive Phase also predicts the probability of cure.

Q 32. What should be done if an error in smear microscopy is detected during cross checking, especially on follow up and at end of treatment?

Ans: If an error is detected at the time of diagnosis, check other smear results, X-ray and ascertain whether patient has been started on treatment. If the patient was missed on diagnosis, he should be traced and put on treatment.

If an error is detected on follow-up smear examinations, no change in treatment is undertaken based on the results of cross-examination. To some extent, there are built-in mechanisms to handle this problem for e.g., re-examination of sputum smears after 5 months of treatment among those who are smear positive at 4 months. However, all efforts must be made to keep the errors on follow-up examinations at minimum.

Q 33. What is the rationale of switching to continuation phase even if the follow-up smear examination at end of extended Intensive Phase shows presence of AFB?

Ans: With treatment of high efficacy, smears can be positive at 2-3 months due to presence of dead bacilli. Therefore, treatment failure based on smear examination is not considered until 5th month of treatment.

Q 34. Switching over to self-administered treatment in continuation phase carries a risk of non-adherence as it conveys relaxation in treatment at a time when patients' symptoms are telling that he no longer needs treatment?

Ans: The treatment during continuation phase is partially supervised and adherence is sustained by continued motivation of the patient and health education. Operationally, it may not be feasible to supervise each dose of continuation phase. However, all those patients who have a history of being irregular, alcoholics etc., should be fully supervised. Others who are willing to be fully supervised during continuation phase should be encouraged.

Q 35. Is there a higher risk of failure among those patients who continue to be smear positive at the end of Intensive Phase?

Ans: Assuming that the history of previous treatment was taken properly at the time of diagnosis, most patients who continue treatment get cured, though relative risk of failure among such cases is higher compared to those who are smear negative at the end of intensive phase.

Q 36. How valid is the policy of adding Streptomycin for re-treatment cases?

Ans: Only a small proportion of patients put on re-treatment regimen are failure cases and likely to be resistant to one or more drugs. Cohort analysis of

patients treated so far in our country shows that two-thirds of the patients remaining smear positive after 5 months of treatment on Cat I and subsequently treated with Cat II have been successfully treated.

Q 37. Efficacy of twice weekly (TW) regimen has been demonstrated in many trials. Would such regimen not reduce the workload on DOT workers?

Ans: In twice weekly regimen, if patient misses one dose, it amounts to once weekly medication, which is more than the lag period for most drugs and increases the risk of development of resistance. Twice weekly regimens are also more toxic because of immunologically mediated adverse effects.

Q 38. In what conditions can Treatment be prolonged?

Ans: Continuation phase may be prolonged up to 7 months with INH & Rifampicin in cases of TBM, Miliary and Spinal TB

Q 39. What are the precautions to be taken during Anti Tuberculosis Treatment?

Ans:(i) Pyridoxine supplementation to pregnant females, diabetics, chronic alcoholics
(ii) Discourage alcohol consumption during treatment
(iii) Monitor for symptoms and signs consistent with hepatic damage
(iv) Liver function tests every 2 - 3 months for those at high risk
(v) Streptomycin is contra-indicated during pregnancy
(vi) Monitor side effects of streptomycin specially in elderly: tinnitus, vertigo, hearing tests for higher frequencies, which are affected first, Romberg's Test
(vii) Avoid loop diuretics, which potentiate side effects of 'streptomycin'.
(viii) Analgesics for arthralgia which usually does not require withdrawal of anti-TB treatment.
(ix) In case of suspected pre-existing optholmological disease, assess visual acuity and colour vision before starting treatment
(x) Stop ethambutol in case of side effects, which are reversible
(xi) Avoid ethambutol among children less than 6 years of age
(xii) Avoid 'Streptomycin' and 'Ethambutol' in renal disease
(xiii) Avoid antacids that decrease drug absorption
(xiv) Women to use non-hormonal contraceptive methods
(xv) In case of hypersensitivity reactions, withdraw treatment completely and desensitize later
(xvi) Monitor steroids, oral anti-coagulants, anti-convulsants, oral hypoglycemics, tranquilizers, theophylline, beta-blockers, calcium channel blockers, digoxin when given concurrently with Rifampicin.

Evaluate each patient by interview and clinical examination for emergence of side effects at the end of each month.

Q 40. What is the role of Fluroquinolones in treatment of TB?

Ans: These drugs are moderately effective with other drugs for MDR-TB and should only be given if standard drugs are not tolerable.

Q 41. What are the problems in treatment with second line drugs?

Ans: (i) These drugs are less efficacious and more toxic.
(ii) They possess cross resistance to first line drugs
(iii) Most patients needing such treatment are difficult to hold e.g. alcoholics, drug addicts, migrants etc.
(iv) Hospitalization is a must for observation and regularizing treatment. Ambulatory treatment is possible only after tolerance and regularity is assured.
(v) It is irrational for any country to divert resources for treating with second line drugs until full potential of SCC regimen has been achieved.
(VI) Requirement of the reserve drugs indicates poor program.

Q 42. What are the guidelines for treatment of TB among children?

Ans: If a child is diagnosed to have tuberculosis, a full course of treatment has to be given. Children rarely suffer from smear positive disease. As a result, there are few bacilli in the lesions and no chance of resistant mutants being present. The recommended regimen is Cat III. The dose of drug has to be calculated in mg per kg body weight and given from loose drug stock. For patients with miliary or meningeal TB, a fourth drug, can be added during intensive phase and the total duration of treatment made to 9 months.

Q 43. Why is it necessary to carefully elicit history of previous treatment?

Ans: The history of previous treatment should be elicited clearly for deciding on the proper category of treatment for the patient. Otherwise, cases may be given wrong treatment, which may lead to treatment failure.

Q 44. How to treat TB patient suffering from liver disease?

Ans: In chronic liver disease, 2 EHRZ / 6 HR can be given unless there is severe liver damage. If ascitis and portal hypertension are present, treat with 2 SHE / 10 HE.

In case of acute hepatitis, the treatment may be deferred. If TB is serious, treat with 3 SE or 3 SE + ofloxacin followed by 6 HR when hepatitis is recovered.

Q 45. What should be done if jaundice develops in a case during treatment?

Ans: Stop all drugs and monitor serum transaminases. Usually treatment can be re-started with the same regimen after the serum levels of transaminases return to normal. In serious cases, Ethambutol and Streptomycin which are least hepato-toxic can be given.

Q 46. How to treat TB patients suffering from Renal Failure?

Ans: Drugs eliminated by non-renal routes - INH, Rifampicin, Pyrazinamide and Thioamides may be given in normal doses.

2 HRZ / 4 HR is safe. Decrease dose of Streptomycin & Ethambutol and adjust by renal function tests.

HIV & TB

Q 47. How does the presentation of TB differ in HIV positive cases?

Ans: Cough is reported less frequently among HIV positive TB cases, as there is less cavitation, inflammation and endo-bronchial irritation because of impaired cellular immunity. Majority of HIV positive pulmonary TB cases is smear positive though their proportion is less than among HIV negative pulmonary TB cases. The main types of Extra-pulmonary TB seen among HIV positive patients are - lymphadenopathy, pleural effusion, pericardial effusion, miliary TB and tuberculous bacteraemia.

Q 48. What are the general guidelines for treatment of HIV positive TB patients?

Ans: Same regimen is used, as for HIV negative TB cases, since sputum conversion rates and cure rates have been observed to be similar if effective chemotherapy is given. However, the treatment in continuation phase may also be fully supervised since lower rates of adherence and higher fatality rates have been observed among such patients.

PREVENTION AND CONTROL

Q 49. Is there any role for preventive therapy under RNTCP?

Ans: Risk of breakdown from infection to disease is maximum during the period immediately following infection especially among young children. So, the symptomatic child contacts less than 6 years old are routinely recommended chemoprophylaxis.

Q 50. In RNTCP, a symptomatic child contact of smear positive cases and less than 6 years of age are given preventive treatment without eliciting the infection status by a tuberculin test. On the other hand a very low cut off point of 6mm is chosen for continuation of preventive chemotherapy beyond 3 months? What is the rationale?

Ans: Tuberculin test may be negative in the

window period. Since the risk of breakdown is maximum during the period immediately following infection especially among young children, a symptomatic child contacts are recommended chemo-prophylaxis irrespective of the tuberculin test result.

INH given for 3 months reduces the tuberculin reaction size considerably and hence a low cut off is used for further continuation.

Q 51. How do you foresee the role of RNTCP in preventing MDR TB?

Ans: The only effective means of preventing MDR TB is to prevent emergence of such cases by DOTS. The proportion of cases with MDR has been demonstrated to have come down with implementation of DOTS, in a number of places all over the world viz. Texas, New York, Peru. In Botswana where DOTS is being implemented, the proportion of MDR TB is one twentieth of that in other African countries where DOTS is not being implemented. At RNTCP sites in India, the proportion of patients put on cat II has been seen to reduce gradually. Experience shows that if we ensure that patients receive every dose of drugs, the emergence of MDR TB can be prevented.

Q 52. What is the role of BCG in TB control?

Ans: BCG prevents childhood forms of TB like disseminated and miliary TB, but has no role in preventing TB in adults especially cavitary forms.

EVALUATION

Q 53. How can we evaluate the impact of RNTCP?

Ans: Because of high cure rates, the proportion of re-treatment cases should decrease. There should be a decline in prevalence of initial drug resistance.

In the community, the impact of any change in disease situation is first reflected in a change in Annual Risk of Infection (ARI) rates. Therefore, repeated ARI surveys along with age distribution of cases can be relied upon for assessment of disease trends in the community.

The decline in prevalence of disease occurs next and decline in disease incidence takes much longer.

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CHALLENGES AND STRATEGIES FOR CONTROL OF TUBERCULOSIS AMONG AGRICULTURAL WORKERS.

VK Chadha* & P Jagota**

Tuberculosis (TB) is the world's foremost cause of death from a single infectious agent and annually there are about 3 million deaths from TB all over the world with about 15% of these occurring in India alone[1-3]. The brunt of the disease is borne by those in the age group of 15-59 years[4]. Approximately 6.7% of all deaths and 18.5% of deaths in the above age group, in the developing world are attributable to TB[5,6]. An estimated one-third of the world population is infected by M. tuberculosis, with 95% of TB cases occurring in developing countries. Among more than 1000 million people in India today, every second adult is infected with the tuberculous mycobacteria and each year more than 2 million people develop active TB. India alone accounts for nearly one third of the global burden of this disease[6].

TB is largely a disease of adults. Within adults, it is prevalent more in older adults than younger adults and more among males than females[7]. Although morbidity and mortality in any age group have significant economic and social consequences, no community can afford to loose its citizens in prime years of life since these are not only the productive years in terms of wage earning but also a period of shouldering family and social responsibilities.

Before 1950, it was widely believed that the problem of TB was only localised to big cities. The first disease survey carried out by Dr Frimodt Moller in the villages of Madanapalle district revealed that TB was prevalent in rural areas also[8]. The strategic importance of TB control in rural areas of the country was recognised when the National Sample Survey (NSS) indicated that 70-80% of TB cases resided in rural areas since TB was as prevalent in rural areas as in urban areas[7]. Most of the later surveys carried out in various parts of rural India reveal that TB continues to be as highly prevalent in these areas as ever before[7-16] (Table 1) and that only a small proportion of rural population escapes infection through good luck or innate resistance.

Annually, more than three lakh TB deaths take place in rural areas out of the total 4.5 lakh TB deaths in the country[17]. About 5 to 6% of all deaths in rural India are contributed by TB[17]. The age and sex distribution of deaths due to TB in rural India is given in table-2[17].

Table 1: Prevalence of pulmonary TB in rural parts of India

Area & year	Sample size	Prevalence of pulmonary TB/1000 population	
		Bacillary	Abacillary
Madanapalle[8] (1950)	20,307 (all ages)	M - 3.2 F - 1.5	M - 5.8 F - 3.0
National Sample Survey[7]	1,22,907 (> 4 years)	3.44 (2.29 to 6.11)*	16.00
Tumkur district, Karnataka[9] (1960-61)	21,021 (>9 years)	4.1 M - 5.6 F - 2.5	19 M - 25 F - 12
Rural Bangalore[10] (4 surveys between 1961-68)	41,000-43,000 (>4 years)	3.4 - 4.0	-
Chingleput (Tamil Nadu)[11] (1968-71)	2,06,609 (>9 years)	10.68 M - 17.04 F - 4.39	14.29 M - 18.86 F - 9.78

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Area & year	Sample size	Prevalence of pulmonary TB/1000 population	
		Bacillary	Abacillary
Wardha[12] (1982-88)	4,87,654 (>4 years)	1.98	-
North Arcot (Tamil Nadu)[13]	18,688 (>4 years)	2.41 (by smear alone)	-
Rural Bangalore[14] (1984-86)	21,924 (>9 years)	4.4 M - 6.4 F - 2.3	-
Morena district, Madhya Pradesh[15]	11,097 (>14 years)	12.7	-
Raichur district, Karnataka[16] (1988-89)	40,000 (> 14 years)	10.7	-

* Prevalence varied from place to place in this range

Table 2 : Total TB deaths in rural India by age and sex (000s)

Age group	Rural areas	
	Males	Females
0-4	4.5	1.9
5-14	2.5	5.3
15-44	85.6	68.8
45-59	76.3	28.8
60 +	65.1	27.2
Total TB deaths	**234**	**132**

Though TB deaths are more common amongst males, it is pertinent to mention that TB kills more women than all other infectious diseases and maternal deaths combined[18]. An analysis of the TB problem among rural women requires understanding in an socio-economic context. The rural women are, often ignored in terms of preference and priorities in getting medical facilities. It is only when the situation worsens and they are unable to take up household activities that they are brought for the treatment. Women are also disadvantaged in terms of nutritional status, multiple responsibilities and specific household tasks such as cooking in the ill-ventilated enclosures. All these conditions make rural women more conducive to make them fall an easy victim of the disease.

In the rural areas of the country, TB is still considered to be a socially outcaste disease. The patients suffering from the disease often do not disclose it for a long time. It has partly to do with their lack of knowledge of the symptoms of the disease and also due to the negative reactions that they fear from the people around them.

In a study conducted in Pune district, one out of every three TB cases were found to be engaged as agricultural labourers[19]. In another study conducted among farm workers of Uttar Pradesh, one out of every five workers suffered from some kind of respiratory disease and one-fifth of the respiratory diseases was due to pulmonary TB[20].

The agricultural occupation is associated with an increased risk of TB because it attracts workers in a high-risk category for TB since most of them have poor nutritional status and live in poor housing conditions. Farm workers are often migrant labourers, they are often not in full time employment and are thus in a low socio-economic stratum. They may also be predominantly male. These characteristics are all associated with increased risk of TB. Many a time, the agriculture and farm workers have to work under dusty conditions leading to high incidence of silicosis among them. Since the patients with silicosis are at a higher risk of developing TB[21], the agricultural workers specially those exposed to dust storms comprise a high-risk group for developing TB. Humans usually acquire TB infection from their immediate environment rather than from an animal source. However, there is a real risk that agricultural people living in closer contact with cattle may acquire the infection from them.

In the survey carried out in the central Indian district of Wardha in Maharashtra, it was found that 42% of the rural population aged 5 years and above was engaged in agriculture. About 85% of the

working population in rural areas and 20% in urban areas were engaged in agriculture related activities[12]. One out of every two chest symptomatics found in the survey was an agricultural worker and a higher proportion of them (3.1%) had symptoms of cough with more than 2 weeks duration, chest pain, prolonged fever or history of haemoptysis compared to 1.9% of the overall population. About half (46%) of the total disease prevalence in the district was contributed by agricultural workers[12].

On extrapolating the above data nationally, it can be surmised that about four million agricultural workers suffer from TB at any given point of time, one million of them are infectious in nature and spread the disease to their family members, neighbours and co-workers. The time off from work prior to diagnosis and during treatment is an economic loss to their families and many of the caregivers also have to take time off from work to assist them. Therefore, the high prevalence of TB in India has serious and adverse consequences on the agriculture produce and thus on overall economy of the nation. Also, the deaths of these workers in the prime of their age have a particularly onerous burden and its consequences on children and other dependants can be disastrous. Being from lower socio-economic strata, they are also the people who are least able to cope up with the disease. Thus the effects of the disease on agricultural families can be devastating both financially and emotionally.

With the population growth, the absolute number of TB cases in the country has been on the increase. The advent of HIV epidemic has already facilitated the return of TB to wealthy nations. In the developing countries where the disease was never controlled, the situation is expected to worsen in the future as a result of the increasing HIV seroprevalence rates since HIV infection is the single most important risk factor for developing TB.

A National Tuberculosis Programme (NTP) has been implemented in the country as an integral part of the general health services since 1962. The programme was evolved by the National Tuberculosis Institute (NTI), Bangalore after the valuable research studies carried out by it threw light on the epidemiological and operational aspects of the programme. Earlier, it had been established by Tuberculosis Chemotherapy Centre, Chennai that the efficacy of domiciliary treatment was as good as treating them at the sanatoria. It was decided that the programme should be felt-need based since a majority of the patients seek treatment at various health institutions. The objectives of NTP were as under:

1. To reduce deaths due to TB.
2. To detect as large a number of TB patients as possible and treat them effectively so that the infectious patients are rendered non-infectious and active and non-infectious cases do not become infectious.

To achieve the above objectives, following components were considered necessary :

1. Sputum diagnoses of all cases at the primary health care level.
2. Domiciliary treatment of the detected cases.
3. Provision of basic facilities and basic record keeping at the Peripheral Health Institutions (PHIs) which include Primary Health Centers (PHCs) and Community Health Centers (CHCs).
4. Improvised referral services and the access to specialized services for more complicated cases.
5. Having a District TB Centre (DTC) at each district, which would not only be responsible for implementing NTP in the district but also provide referral services to the PHCs and CHCs, which form a part of the health service delivery system in the rural areas.

Case-finding activities in NTP are undertaken by examining the symptomatics attending the various Health Institutions. Under the programme, the treatment of sputum positive TB patients has been accorded priority over that of sputum negative cases in order to cut the chain of transmission. Treatment is decentralized and is offered on a domiciliary basis. Anti-TB drugs are issued free and retrieval action is taken in respect of TB patients who interrupt treatment. Management of NTP covers planning, implementation and maintenance of various activities under DTP and the responsibility of this rests with the District TB Officer (DTO) assisted by his key staff.

CONSTRAINTS IN TB CONTROL

TB still tops the list of causes of deaths and disease in this country and the problem in rural areas of the country has not declined from the situation 50 years ago in spite of the advent of anti-TB drugs and implementation of the NTP. Even the case fatality rates have remained high as shown by the surveys conducted by NTI before implementing the

programme and 20 years after implementation of the programme[22].

One of the most significant obstacles of achieving TB control is the challenge of implementing TB control activities in rural populations as the health care infrastructure in most rural areas of the country is still not fully developed. Accessibility is affected by the factors such as distance to the nearest place where the patient could go for treatment, which is usually far away in rural areas. It often takes one full day for the patient to make a single visit especially in view of general lack of transport facilities. Many of the rural TB patients do not present themselves to medical facilities in time with the result that there is a delay in diagnosis[23]. This delay may be because of financial barriers that include the cost of transportation and loss of wages besides the fact that a significant proportion does not feel sick enough to seek care[24]. Many of the cases are not even aware of the availability of treatment in public health services[19].

Many a time, the patients on approaching a medical facility are returned undiagnosed and some incur sizeable expenditure on general antibiotics before they are diagnosed as TB.

There has been an overemphasis on using X-rays for diagnosing TB, which leads to overestimation of cases. X-ray, as a case-finding tool has severe limitations and is about 7-10 times costlier than sputum microscopy, which is also a more reliable diagnostic tool[25].

Inability of the health providers to administer complete and regular treatment for 6-8 months has been a major impediment to controlling TB. Irregular supply of drugs especially to PHCs, low image of public health services, lack of patient-doctor rapport and high cost of care which include travel cost, loss of wages and doctor's fees and cost of drugs when taking treatment from the private sector are some of the important reasons.

The rural PHIs lacked the administrative and technical support from the DTC and implemented the TB programme in a perfunctory manner. Many a times, there has been shortage of basic supplies like sputum cups, slides, strain and drugs. Little attention was paid to patient's education and there was general lack of accountability of all categories of health persons.

Under the National TB Programme, antitubercular drugs were to be provided free of cost to the patients. However, there was perpetual shortage of drugs in the government pharmacies and the patients had to incur high cost of procuring drugs at the market price. Thus, even in a programme offering free service, there were direct and indirect costs to the patients, which encouraged drug defaulting in the long run.

Almost half of the patients depend upon public health services for relief[24]. However, the services were not satisfactory in many parts of the country with the result that patients have to seek relief from private health agencies. In addition to high service charges, these private agencies rely more on X-ray of the chest for diagnosis and may not adhere to the standard drug regimens[26], leading to financial losses for the patient and increased possibility of drug resistance. A high proportion of the TB patients incur debt being unable to bear the expenses of the treatment.

The key staff of the DTC seemed rather satisfied being engrossed in providing clinical services and paid little attention to management and supervision of the programme in the district. Recording and reporting under the programme was equally bad to give any reliable information on either epidemiology of the disease or efficiency of the case finding and treatment.

In the presence of inefficient case-finding and poor treatment completion rates, the problem due to the disease continued to be unabated. Less than 50% of the patients adhered to complete the course of treatment[27]. When the treatment is not completed, not only is the patient's life jeopardized but also the patient continues to infect others in the community and such infections have a greater likelihood of becoming multi-drug resistant. The cost of treating such patients is so enormous that it is beyond the scope of any health programme. One of the alternatives adopted to overcome the problem of drug default has been the gradual replacement of the 12-month long course treatment with a shorter and more effective six month Short Course Chemotherapy (SCC), which leads to better compliance resulting in higher cure rates.

Since the group of agricultural workers is one from lower socio-economic strata, many a times these workers have, to move from one place to another seeking livelihood. These characteristics pose particular problems especially when they migrate to

urban areas where they have to live in sub-standard housing conditions, which is a further risk for developing TB. Increased rates of TB have often been observed in migrant populations.

APPROACHES FOR IMPROVEMENT OF TB CONTROL ACTIVITIES

Several innovative approaches would have to be developed to overcome these problems in implementation of TB control activities especially for achieving and sustaining high cure rates for all rural patients with infectious TB.

The importance of prescribing appropriate anti-tubercular drug regimens and preventing treatment default cannot be over-emphasized. Effective TB treatment not only cures current cases but also prevents future cases, which are indirect benefits of chemotherapy. One of the major determinants for successfully treating TB is the level and intensity of supervision by the health care delivery system. The approach that has been adopted by TB programmes all over the world is to ensure that each dose is administered to the patient under the supervision of a health worker or a dedicated health volunteer. Direct observation of treatment is an essential component of DOTS strategy, and has yielded high cure rates of about 85% in many countries including our own.

DOTS is the only way of ensuring high cure rates and thus has the benefits of reduction in transmission of infection by rendering infectious cases non-infectious. There are additional savings in future due to lower numbers of relapses and preventing development of resistance to antibiotics in both of which situations, treatment is much costlier.

The Revised National Tuberculosis Control Programme (RNTCP) takes advantage of the technology revolution, which 'took place by the introduction of DOTS. In countries like Tanzania, it was shown that DOTS had enhanced the rate of reduction in infectors (diseased) and infected (potential) by 50% in 15 years[29]. The RNTCP also effectively utilizes the enhanced availability of infrastructure and manpower that has developed in the primary health care system over the years, but has not been utilised under the NTP.

The objectives of the revised strategy are as under :

1) To cure at least 85% of all newly detected cases of pulmonary TB with supervised SCC.
2) To detect at least 70% of the estimated incidence of smear positive pulmonary TB cases.

A chest symptomatic reports to the nearest health facility, where his sputum is tested. In case sputum examination facility is not available here, then the patient is referred to the nearest Microscopy Centre. After three sputum samples have been examined, the patient is put on anti-TB treatment in case at least two of the three samples are positive. If only one sample is positive, an X-ray is taken. The medical officer decides the treatment to be given on the basis of X-ray and clinical examination. If all the three sputum specimens are negative, then the patient is given a course of antibiotics for 7-10 days. In case symptoms still persist, then X-ray is taken and the medical officer decides on the subsequent treatment.

Anti-TB treatment is administered depending upon category of the patient. During intensive phase, DOTS is administered with the help of a peripheral health functionary; while in continuation phase a patient collects the drugs on weekly or fortnightly basis. Drugs are taken 3 times a week throughout. The provision and maintenance of uninterrupted drug supply of anti-TB drugs has contributed to improving compliance and cure rates.

Drug administration is appropriately recorded on the treatment cards, which are prepared and kept at the place of diagnosis and treatment. The information from the treatment card is transferred to the TB Register, which is kept at the sub-district level and is updated from time to time by the Senior Treatment Supervisor (STS). Quarterly reports on case-finding and treatment outcomes are prepared at the sub-district level and sent to the district level for compilation and onward submission to State and Central levels. Analysis of data would take place at district, state and central level and information would flow back to the sub-districts for corrective actions.

The RNTCP has already been extended to about 500 million and is expected to cover the whole country in the course of the next five years.

Other suggested inputs needed to intensify TB control efforts are as under.

TB mortality and morbidity would decline only if increased financial support is made available each

year to TB control programmes in developing countries. A strong political will and advocacy, is required to appreciate the enormity of the problems due to TB and to allocate appropriate budgets for TB control programmes. Enhanced finances are needed to enable the TB programmes to undertake training programmes, improve registration systems and monitoring tools, to finance medicines, microscopes and improve the modest infrastructure so that these programmes work efficiently. Additional resources are also required to cater to the increasing number of patients having HIV and TB as these patients may also require expenses due to hospitalization.

Accurate knowledge and increased awareness among the general public especially the high risk groups such as agricultural workers needs to be communicated to remove their misconceptions and modify their help-seeking behaviour favourably. They must be educated that TB is curable with complete and regular treatment and that sputum microscopy is the most reliable tool for diagnosing TB. Informing people about the programme must receive the top most priority, since a sustained awareness programme can go a long way in more and more people reporting for treatment. Community participation in the programme especially in detection and referral of chest symptomatics for sputum examination and supervising treatment must be encouraged.

Diagnosis of TB, its treatment and follow-up of patients till they are cured can all be effectively undertaken at the level of PHC. Therefore, PHCs must be strengthened in respect of leadership, management, drugs & supplies and record keeping.

Strengthening of operation research and improving the functioning of the existing health care systems, and roping in of NGOs and private practitioners to assist control programmes are other essential ingredients to successfully combat the menace of TB.

Improvement in socio-economic conditions of rural populations including agricultural workers will reduce the burden of the disease as had been observed in western countries where the incidence of the disease declined in the beginning of this century prior to the anti-tubercular therapy era.

As TB control programme evolves into the next millenium, the public health community should take all appropriate actions aimed at intensifying the TB control efforts in order to reduce the enormous burden imposed by this disease.

REFERENCES

1. World Development Report, 1993 : investing in health : The global burden of disease in 1990, 213, Oxford University Press.

2. Dollin RJ, Raviglione MC & Kochi A : A review of current epidemiological data and estimation of future TB incidence and mortality; WHO/TB/93.173.

3. Chadha VK : Global Trends of TB - An epidemiological review; NTI Bulletin, 1997,33,11-18.

4. Murray CJI, Styblo K & Rouillon A : TB in developing countries; burden, intervention and cost; Bull of IUAT & LD, 1990, 65, 2-19.

5. United Nations, 1986 : World population prospects, estimation and projections as assessed in 1984, New York.

6. TB control in India, Developing role of NGOs, ACTION AID India, 1996,10.

7. Indian Council of Medical Research : TB in India - A sample survey, 1955-58, Special Report Series No.34, ICMR, New Delhi.

8. Frimodt Moller J, Benjamin P & Mathew P : Results of Mass X-ray Surveys in a Village Population at Madanapalle; Proceedings of the 9th TB Workers Conference, Lucknow, 1952,133-43.

9. Raj Narain, Geser A, Jambunathan MV & Subramanian M : TB prevalence survey in Tumkur district: Indian J TB 1963,10, 85-116.

10. National TB Institute, Bangalore: TB in a rural population of south India - A five year epidemiological study; Bull WHO 1974, 51, 473-88.

11. TB Prevention Trial, Madras : Trial of BCG vaccines in south India for TB Prevention; IJMR, 72(suppl),1980,1-74.

12. ICMR Project Report: Field Trial of short term intermittent chemotherapy against TB; and ICMR project, Department of Community Medicine & Development of Microbiology, Mahatma Gandhi Institute of Medical Sciences, Savagram, Wardha, 1989.

13. Ray D & Abel R: Incidence of smear positive pulmonary TB from 1981-83 in rural area under an active health care programme in south India; Tubercle & Lung Dis 1995, 76,190-95.

14. Chakraborty AK, Suryanarayana HV, Krishna Murthy VV & Shashidhara AN: Prevalence of TB in a rural area by an alternative survey method without prior radiographic screening of the population; Tubercle & Lung Dis 1995, 76, 20.

15. Chakma T, Vinay Rao P, Pall S, Kaushal LS, Manjula Datta & Tiwary PS: Survey of pulmonary TB in a primitive tribe of Madhya Pradesh; Indian J TB 1996,43,85-89.

16. Gopi PG et al : A TB prevalence survey based on symptoms questioning and sputum examination; Indian J TB 1997, 44,171-80.

17. World Health Organization : The potential economic benefits of the DOTS strategy against TB in India; WHO/TB/96.218.

18. Maire Connolly & Paul Nunn : Women & TB; WHO State Qtly 1996, 49/2, 115-19.

19. Mukund Uplekar & Sheela Rangan : Tackling TB - the search for solutions; the foundation for research in a community health; 1996.

20. Agnihotri MS et al : Disease pattern among farm and construction workers of Uttar Pradesh - A brief summary; Indian J TB, 1991, 38/2, 107.

21. Narboo T, Angchuk PT, Yahya M, Kamat SR, Pooley FD, Corrin B, Ken IH, Bruce N, Ball KP; Thorax 1991, "Silicosis in a Himalayan village, role of environmental dust".

22. World Health Organization: "Prevalence and incidence of TB infection and disease in India"; WHO/TB/97.231.

23. Chadha VK & Deshmukh DB: Case-finding and related issues in TB; NTI Bull, 1995, 31,48-53.

24. Banerji D & Anderson S: A sociological study of awareness of symptoms among persons with pulmonary TB; Bull of WHO, 1963, 29, 665-683.

25. Naganathan N, Padmanabha Rao K & Rajalakshmi R: Cost of establishing and operating a TB bacteriological laboratory, 1974, Indian J TB, 21(4).

26. Upleker M & Sheela Rangan: Private doctors and TB control in India: Tubercle and LD, 1993, 74, 332.

27. National TB Institute: Performance of the National TB Programme for the year 1996, NTI Bull, 1997, 33/19-20.

28. World Health Organization; Treatment of TB, Guidelines for national programme, 2nd Edition, 1997, Geneva, WHO/TB/97.220.

29. World Health Organization: WHO report on the TB epidemic, 1995; WHO/TB/95.183.

NATIONAL SAMPLE SURVEY TO ESTIMATE ANNUAL RISK OF TUBERCULOUS INFECTION IN DIFFERENT PARTS OF INDIA

Progress Report : Jan - June, 2002

This is in continuation of reports published in previous five issues of NTI Bulletin regarding the survey, which is being conducted by the National Tuberculosis Institute as a nodal center. upto June 2002, 1,71,588 children were investigated. The fieldwork has been completed in north, south and west zones. It is currently under progress in the east zone and is likely to be completed by January 2003. The cumulative progress of the fieldwork till June, 2002 is as under :

Zone	District	No. of clusters surveyed till 31st December, 2001	No. of children test read (Approx)	Present status
North	Gurdaspur (Punjab)	63	5040	Field work completed and analysis under progress
	Rae Bareilly (Uttar Pradesh)	90	7138	
	Hardoi (Uttar Pradesh)	105	8400	
	Kangra (Himachal Pradesh)	47	3760	
	Delhi	168	13440	
	Jaunpur (Uttar Pradesh)	127	10160	
South	Dakshina Kannada (Karnataka)	91	7746	
	Medak (Andhra Pradesh)	74	6143	
	Belgaum (Karnataka)	119	10223	
	Kanyakumari (Tamil Nadu)	53	4440	
	Chingleput - M.G.R. (Tamil Nadu)	163	13040	
	Malapuram (Kerala)	100	8000	
West	Junagadh (Gujarat)	100	9145	Field work completed and analysis for one district is completed
	Kota (Rajasthan)	83	6640	
	Nagpur (Maharashtra)	114	9120	
	Jhabua (Madhya Pradesh)	53	4240	
	Thane (Maharashtra)	178	14240	
	Ratnagiri (Maharashtra)	71	4990	
East	Purbisinghbum(Jharkand)	48	3840	Completed
	Bardhamaan (West Bengal)	161	12240	Completed
	Cuttack (Orissa)	57	4651	Completed
	Sikkim	18	1469	Completed
	New Jalpaguri	46	3483	Under progress
Completed so far No.of districts completed = **22** No.of districts under progress = **1**		**2129**	**1,71,588**	

Data entry of the East zone is under progress. The field work is being supervised by officers and staff of NTI on day to day basis. The primary analysis for the North, South and West zones have been completed.

Dr VK Chadha
Sr. Epidemiologist
NTI, Bangalore

SURVEILLANCE OF DRUG RESISTANCE IN THE DISTRICTS OF MAYURBHANJ, HOOGLI & NAGAON

Progress Report : Jan - June, 2002

By the end of 2nd Quarter 2002, the total intake of specimens was completed in Hoogli, Mayurbhanj and Nagaon districts.

The number of specimens received for the period ending June 2002 is furnished below :

District	Total Specimens
Hoogli	352
Mayurbhanj	342
Nagaon	351

The laboratory cards for which bacteriological investigations have been completed has been sent to Statistics Section for data entry and further analysis.

Dr B Mahadev
Chief Medical Officer
NTI, Bangalore

NTI Bulletin 2002, 38/1&2, 20-21,

HEALTH INTERNETWORK INDIA
PILOT PROJECT - TUBERCULOSIS

Meeting of the project managers chaired by the Director was held at NTI on 25th January 2002 to review the progress and this was attended by Mr Ranjan Dwivedi, Project Manager, WHO, Dr Nirmala Murthy, Project co-ordinator, Foundation for Research in Health Systems, Dr L Suryanarayana, CMO, Dr VK Chadha, Section Officer Library and Publications; Mr KP Unnikrishnan, Chief Statistical Officer, Mrs Sudha S Murthy, Senior Librarian and Mr R Jitendra, Computor. The Director appraised the project Manager and Dr Nirmala Murthy about the formation of the local working committee, with Director, NTI as Project Director; Mr KP Unnikrishnan, CSO, as Project Co-ordinator & Dr L Suryanarayana, CMO, Dr VK Chadha, Senior Epidemiologist, Dr Lalitha Suryanarayana, CMO and Mrs Sudha S Murthy, Senior Librarian as members from NTI.

Detailed discussions were held with regard to inventory of Research carried out by Research institutions and individual researchers. It was decided to initiate this task as early as possible with the data available at the NTI library. For the data that are not available at NTI library, TRC, Chennai and other resource institutions will be contacted.

Quantification of published data on TB from 1980 has started. Mr Nandish Prasad, Computor has been deputed to do the same. A total of 896 documents have been identified not only from participating institutions viz., NTI, Bangalore, TRC, Chennai, VP Chest Institute New Delhi, New Delhi TB Centre, TB Association of India, New Delhi, but also from Medical Colleges, Non Government Organisation's, TB Hospitals/Clinics; District TB Centres, State TB Demonstration and Training Centres etc.

In the meeting held on 25th February 2002 to review the progress of work it was decided to make NTI, Bangalore responsible for content selection and development. It was also decided that details of the data quantified may be started henceforth and to follow acceptable international standard template for the data entry. Following decisions have been taken during the HIN meetings held on 14th and 27th March 2002.

1. An exhaustive database on TB to be created.
2. Five participating institutions to send data as soft copy.
3. Criteria to be applied for selecting the data mainly depend on the needs of users requirements. NLM's MeSH will be used for assigning key words.
4. Important articles to be selected from the data base for full text publication.
5. The NTI, Bangalore to be the Nodal Centre for selection of articles into the database and digiti zation.

Need Assessment Survey

A decision was taken to conduct a need assessment survey for the project in Doddaballappura and Kanakapura taluks of Karnataka state, and separately in Orissa State. The investigators from NTI, Bangalore and Orissa were imparted training at NTI on data collection, by Dr. Nirmala Murthy, local programme co-ordinator of the project. Dr. (Mrs) Sophia Vijay, Senior TB Specialist took active part in preparation of the questionnaire for the need assessment survey. The NTI faculty, Dr. Nirmala Murthy, Mrs Chinappa, Dr. DK Srinivasa and faculty of MS Ramaiah Medical College discussed the questionnaire in the meeting held on 3rd January 2002 at NTI, Bangalore. The field work was started on 22nd January 2002 by the team consisting of Health Visitor Mr BA Eswara and Mr NK Hemanth Kumar and one Social Worker Mr HS Mallikarjunaiah led by Dr. (Mrs) Lalitha Suryanarayana, CMO. Interviews were conducted with the Government Medical Officers, Private Medical Officers, Pharmacists (Private and Government), Laboratory Technicians and X-ray Technicians of Doddaballapura and Kanakapura Taluks.

The list of respondents were as under :

State Level :

Programme Administrators :- 5
Director Health Services
Director Medical Education
Joint Director (TB)
Joint Director (Public Health)

Faculty and Researchers :- 12

Faculty from Department of Medicine
Department of Chest Disease
Department of Community Medicine
at St. John's Medical College, Bangalore Medical College and two faculty members from NTI, Bangalore.

Medical Officers of Private/Public Hospitals :- 10

Bowring Hospital	-	2
St. Marthas Hospital	-	4
Sds Sanatorium	-	4

Professional Association :- 5

Indian Medical Association	-	4
State TB Association	-	1

District Level :

Administrators :- 6

District Health Officer (Urban & Rural)
Taluk Medical Officer (Kanakapura & Doddaballapur)
District Health Education Officer and
District Tuberculosis Officer

DISTRICT LEVEL DATA

	KANAKAPURA TALUK	DODDABALLAPURA TALUK
Taluk Hospital, PHC & PHI Govt. Medical Officer	15	15
Health Workers/ Para Medical Workers /Supervisors	30	30
Pharmacist/Technicians Lab-Technician & X-ray	7	8
Private Medical Practitioners	15	15
Total	**67**	**68**

Workshop On Need Assessment Survey

HIN-India in collaboration with Rajiv Gandhi University of Health Sciences (RGUHS), Bangalore and the Foundation for Research in Health Systems, Ahmedabad organised the HIN-Planning workshop at the National Tuberculosis Institute, Bangalore from 2nd - 3rd May 2002. Approximately 40 participants, all potential beneficiaries viz., State and District level Health Administrators from Bangalore and Orissa, Medical and Para-medical staff from Primary Health Centres, Pharmacists, Private Practitioners, senior faculty from 4 resource Research institutions viz., NTI-Bangalore, TRC-Chennai, LRS-New Delhi and VP Chest Institute-New Delhi attended the workshop. The workshop began with Dr. L Suryanarayana, Director I/c welcoming the Chief Guest, Dr. Chandrashekhara Shetty, Vice Chancellor of RGUHS, Bangalore. Dr. LS Chauhan, DDG (TB) and Dr. (Mrs) Prabha Jagota, Ex-Director, NTI, attended the workshop. Dr. VH Balasangameshwara, CMO, Mr KP Unnikrishnan, CSO, Dr. Lalitha Suryanarayana, CMO and Mrs Sudha S Murthy, Sr. Librarian, actively participated in the deliberations. Mrs Sudha S Murthy introduced the NTI website to the participants and explained the importance of website in information retrieval on the research and training activities, performance of NTP and public health education.

Staff of X-ray and Statistics sections provided supporting services viz., generator backup, computer assistance, audio etc. Mr R Jitendra, Computor prepared consolidated statement of quotations received for procurement of hardware, software, networking, ISP etc., under the HIN. Preprint version of the HIN workshop received from Dr Nirmala Murthy, Project Co-ordinator was circulated among the concerned faculty.

Budget Proposals

Mr R Jitendra, Computor provided technical clarifications to Mr Ranjan Dwivedi regarding the quotes forwarded by NTI. First installment of Rs. 1,03,500/- as agreement for performance of work was received from the Project Manager, WHO-SEARO, New Delhi.

TRAINING & SUPERVISORY ACTIVITIES DURING JANUARY - JUNE 2002

Training

National TB Programme (NTP)

Regular Training course (8 weeks)

The 87th training course on Tuberculosis (TB) control of 8 weeks duration for DTP key personnel was conducted at the Institute from 15th January 2002 to 8th March 2002. In all 58 trainees consisting of 11 Medical Officers and 46 Para medicals from different states of the country/other countries, participated in this training programme. This includes two fellows from Bhutan sponsored by WHO for 8 weeks. The break up of trainees is as follows:

Sl.No.	Category	Number
1.	Medical Officers (MOs)	11
2.	Laboratory Technicians (LT)	15
3.	X-ray Technicians (XT)	08
4.	Treatment Organizers (TO)	13
5.	Statistical Assistants (SA)	11
	Total	**58**

As a part of the training programme, trainees were taken to Devanahalli, Bangalore Rural, Bangalore Mahanagara palike, Anekal TB unit, DTC Tumkur, DTC Mandya, DTC Mysore, Hoskote PHC and General hospitals of Doddaballapur, Kunigal, Kanakapura, Ramanagara and Nelamangala. Patient interviews by trainees were conducted at the above centres and also at the residence of patients.

Orientation training for undergraduates, medical/Para medical students

Sl. No.	Category & Organization	Nos.	Period
1	Nursing Students, Victoria Hospital Nursing School, Bangalore	42	3.1.2002
2	Nursing Students, St.John's Medical College, Bangalore	22	4.1.2002
3	B.Sc Microbiology students, Islampur College Sangli, Maharashtra	9	9.1.2002
4	B.Sc Microbiology students, Rajajinagar parents Association College, Bangalore	18	16.1.2002
5	B.Sc Microbiology students, Gautam College of Nursing, Bangalore	22	17.1.2002
6	B.Sc Final year students, Willington College, Sangli, Maharashtra	14	18.1.2002
7	B.Sc Microbiology students, Arts & Science College, Bangalore	19	22.1.2002
8	Microbiology Students, Shivaji University, Pune	9	9.2.2002
9	B.Sc Microbiology Students, Gandhi University, Kottayam, Kerala	22	12.2.2002
10	Microbiology Students, Indian Academy Degree College, Kalyannagar, Bangalore	11	1.3.2002
11	Microbiology Students, Vishveshwarapuram College of Science, Bangalore	13	11.3.2002

Sl. No.	Category & Organization	Nos.	Period
12	Microbiology Students, East West College of Science Rajajinagar, Bangalore	12	13.3.2002
13	Medical Assistants, Medical Training Centre, Air Force, Domlur, Bangalore	50	20.3.2002
14	B.Sc. Nursing students, MS Ramaiah Institute of Nursing Education & Research, Bangalore	40	30.4.2002
15	Senior Health Assistants, Vani Vilas Hospital, Bangalore	32	07.5.2002
16	I Year Nursing students, MS Ramaiah Institute of Nursing Education & Research, Bangalore	33	13.5.2002
17	II Year Nursing students, St. John's College of Nursing, Bangalore	15	15.5.2002
18	III Year B.Sc. students, Faran Education Trust (R) College of Nursing, Bangalore	33	17.5.2002
19	III Year Nursing students, MS Ramaiah Institute of Nursing Education & Research, Bangalore	50	23.5.2002
20	III Year B.Sc. students, Faran Education Trust (R) College of Nursing, Bangalore	32	24.5.2002
21	II Year B.Sc. students, Father Muller College of Nursing, Mangalore	24	26.6.2002
22	I Year B.Sc. students, Hill Side College of Nursing, Bangalore	30	26.6.2002
23	I Year GNM students, Hill Side College of Nursing, Bangalore	32	27.6.2002
24	Nursing students, Jayanagar Nursing College, Bangalore	33	27.6.2002
25	DTO's and NGO's of Karnataka	35	27.6.2002
26	I Year GNM students, Hill Side College of Nursing, Bangalore	30	28.6.2002

Special Training :

Mr Sonam Wangchuk, Medical Technologist (WHO fellow) from Public Health Laboratory, Department of Health Services, Thimpu, Bhutan, has undergone training in Mycobacterial Isolation, Identification and Sensitivity Testing for 8 weeks.

Miss S Shilpa, II year M.Sc. Microbiology student from St. George College of Management and Science, Bangalore has also undergone 8 weeks training in Mycobacterial Isolation, Identification and Sensitivity Testing as part of her project work.

A special training for DANTB recruits to conduct the Annual Risk of Tuberculosis Infection (ARI) survey in Orissa was conducted from 11th March to 20th April 2002 at National TB Institute, Bangalore. The training programme comprised of lectures and discussions on various epidemiological aspects of TB Control in addition to exhaustive field training on the conduct of tuberculin survey.

Three postgraduate students in Microbiology from Dr BR Ambedkar Medical College, Bangalore observed isolation, identification and sensitivity testing of mycobacterium tuberculosis and microscopy from 1st to 19th April 2002 at the Bacteriology section of the Institute.

Dr (Mrs) GS Vijayashree, II year MD (Microbiology) student from Karnataka Institute of Medical Sciences (KIMS), Hubli was imparted training in Microscopy, Isolation, Identification and

Sensitivity testing of M. Tuberculosis from 21st to 31st May 2002.

Workshop :

Sensitization workshop on HIV-TB was conducted on 19th March 2002 for the stakeholders at state level in collaboration with Karnataka State AIDS prevention society. In all 55 participants took part in the workshop. Dr. L Suryanarayana, Director, NTI, Dr. D Thimmaiah, Addl. Project Director, Karnataka AIDS prevention society, Dr. V Ravi, Addl. Professor and Head of Department of Neurovirology, Dr James Blanchard, Resident Project Co-ordinator, Indian Chapter, Bangalore, Dr. HG Narayanamurthy, Jt. Director (TB) LWSTC, Bangalore and Dr. (Mrs) Sarojamma, TB Co-ordinator, Bangalore Mahanagara Palike, participated as resource persons. The officers and staff of the institute actively participated in the workshop. A report is being prepared .

Revised National Tuberculosis Control Programme (RNTCP)

Training :

The NTI faculty and concerned staff as facilitators actively participated in the following Training Programmes held at National TB Institute, Bangalore.

Sl.No.	Period	No. of participants	Details
1	7th to 19th January 2002	28	Modular Training in RNTCP for the Medical officers of the states of Madhya Pradesh, Karnataka, Goa and Chattisgarh. As a part of the training the participants were taken for a field visit to Hanumanthanagar, Broadway and Neelasandra RNTCP TB treatment Centres.
2	11th to 23rd February 2002	21	Modular Training in RNTCP for Medical Officers of the States of Madhya Pradesh, Andaman & Nicobar and Karnataka. As a part of the Training the Medical Officers were taken to Broadway TB Unit on 20th February 2002 for field demonstration and training.
3	4th to 13th March 2002	7	Modular Training in RNTCP for the Sr. Treatment Supervisors of Karnataka.
4	4th to 15th March 2002	6	Modular Training in RNTCP for the Sr. TB Laboratory Supervisors of Davanagere, Bagalkot and Bangalore rural districts of Karnataka.
5	18th to 30th March 2002	10	Modular Training in RNTCP for MO-TCs of the state of Karnataka.
6	24th March 2002	38	Orientation Training on RNTCP was given to the Medical Officers working in the Public Sector undertakings in connection with the observance of World TB Day.
7	8th to 20th April 2002	18	Modular training in RNTCP for the MO-TC's of districts of Karnataka.
8	29th April to 10th May 2002	17	Modular training in RNTCP for the MO-TC's from districts of Karnataka.
9	27th to 31st May 2002	7	Modular training on RNTCP for MO's of BMP, Bangalore.
10	27th to 29th May 2002	4	Modular training on RNTCP for TB Health Visitors of BMP, Bangalore.
11	27th May to 7th June 2002	8	Modular training on RNTCP for Laboratory Technicians of BMP, Bangalore.
12	27th May to 14th June 2002	3	Modular training on RNTCP for STLS Technicians of BMP, Bangalore.
13	3rd to 14th June 2002	27	Modular training on RNTCP for District TB Officers of Chattisgarh, Madhya Pradesh and Karnataka.
14	24th June to 5th July 2002	11	Modular training on RNTCP for Laboratory Technicians of Karnataka.

Supervision/Appraisal/Meetings/Discussions/Lectures/Training on RNTCP

Sl.No.	Name of Officer / Staff	Period	Place / Purpose
1	Dr VK Chadha, Sr.Epidemiologist	2nd - 3rd Jan 2002	Supervision visit (RNTCP) to Bardhaman District.
2	Mr BA Eswara, Health Visitor	8th - 9th Jan 2002	Supervision visit to Lucknow DTC and Kamalnagar PHC.
3	Dr VK Chadha, Sr.Epidemiologist	20th Jan - 18th Feb 2002	Supervision visit of DTC Cuttack and PHI's of Baideshwar and Bharam.
4	Dr VH Balasangameshwara, CMO Dr (Mrs) Chitra Nagaraj, CMO	1st - 12th Apr 2002	National level Modular Training in RNTCP for District TB Officers of North Eastern States of India conducted by State TB Officer, Imphal, Manipur.
5	Dr VK Chadha, Sr.Epidemiologist Dr B Mahadev, CMO, Dr Preetish S Vaidyanathan, SMO Mr KP Unnikrishnan, CSO Mr Zacharia Joseph, Sister Tutor Mr N Srikantaramu, SA Mr S Ravindra, XT Mr HD Surendra, LT Mr K Mohan, UDC	15th -27th Apr 2002	Participated as facilitators and trainers in the RNTCP Sensitization Programme for the Medical Officers and Para-Medical staff of A & N Health Services, Port Blair, Andaman and Nicobar islands.
6	Dr B Mahadev, CMO	5th - 24th May 2002	Participated as facilitator in Master Trainer's Training Programme under RNTCP at Regional Training Centre, Indore.
7	Dr (Mrs) Sophia Vijay, Sr.TB Specialist	27th May - 2nd June 2002	Participated as facilitator in Modular Training of MO-TC's, DTO's and Officers of STC, STDC, Trivandrum.
8	Dr VK Chadha, Sr.Epidemiologist	1st week of June 2002	Supervision visit to review the progress of ARI Survey, District TB Centre, Mayurbhunj.
9	Dr (Mrs) Chitra Nagaraj, CMO	13th - 24th June 2002	Participated as facilitator in the Trainer's Training Programme on RNTCP for the District TB Officers of North Eastern States, District TB Centre, Dibrugarh.

Appraisal visits under RNTCP

Sl. No.	District	Period	Chairperson & Team Members	Details
1	Ramanagaram	11th January 2002	Director, NTI	Reappraisal visit to initiate the service delivery by the second week of February 2002
2	Bangalore Rural	11th January 2002	Director, NTI; Dr L Suryanarayana, CMO; Dr HG Narayana Murthy, STO; Dr. Sarojamma, Project Co-ordinator, BMP; Dr KN Prasad, WHO RNTCP Medical Consultant ; 1 SA and 1 computor	Reappraisal of the preparedness of Bangalore Rural RNTCP District. The report for approval of Director, NTI and other members was finalized on 24th January 2002

Sl. No.	District	Period	Chairperson & Team Members	Details
3	Guntur, Andhra Pradesh	4th to 6th February 2002	Dr VH Balasangamesh -wara,CMO; Dr Venkateshwarulu STO; Dr Anshu Banerjee, DIFD Consultant; Dr Surma, WHO RNTCP Medical consultant	Reappraisal of the preparedness of Guntur RNTCP district. Report submitted to DDG (TB) through Director, NTI
4	Cuddapah, Andhra Pradesh	5th to 7th March 2002	Dr Preetish S Vaidyanathan,SMO	RNTCP appraisal
5	Medinipore, West Bengal	12th to 16th March 2002	Dr VH Balasangamesh -wara, CMO; Dr Barun Bhattacharya, STO; Dr Malini Kar; Dr Anand Das & Dr Anand Lakshman WHO RNTCP Medical consultant; Dr Barai & Dr AB Das, DTOs	Appraisal of the preparedness of West and East Medinipore RNTCP districts. Report submitted to DDG (TB) through Director, NTI
6	North 24 Parganas, Murshidabad, Malda, West Bengal	17th to 23rd March 2002	Dr VH Balasanagmesh -wara, CMO; Dr Barun Bhattacharya, STO, WB; Dr Sharma, STO Manipur; Dr Alka A Singh, Dr Rita Bose, Dr. Ambarish Dutta WHO RNTCP Consultants and DTOs	Internal Assessment of RNTCP was carried out and report handed over to Dr. Alka Singh for submission to Central TB Division.
7	Villupuram & Namakkal, Tamilnadu	17th to 22nd March 2002	Dr B Mahadev, CMO and Team	RNTCP internal evaluation was carried out and report submitted to DGHS, Central TB Division, New Delhi.
8	Hamirpur, Himachal Pradesh	18th to 20th March 2002	Dr VK Chadha, Sr Epidemiologist and Team	RNTCP internal evaluation as per the protocol designed by the Central TB Division and report submitted to Central TB Division, New Delhi.

Participation in Conference/Seminars/Meetings/Workshops/Training etc

Sl. No.	Faculty	Period	Details
1	Dr (Mrs) Prabha Jagota, Director	4th to 5th January 2002	Dr K Nagappa Alwa oration award for the paper "Genesis of Directly observed Treatment Short Course (DOTS)" delivered at the 12th Karnataka State TB & Chest Diseases Conference held at Bidar, Karnataka.
2	Dr B Mahadev, CMO, Dr (Mrs) Chitra Nagaraj, CMO & Mr HD Surendra, LT	4th & 5th January 2002	Participated as guest speakers at the 12th Karnataka State TB & Chest Diseases Conference held at Bidar, Karnataka.
3	Dr (Mrs) Sophia Vijay, Sr TB Specialist	4th & 5th January 2002	Delivered a talk on "Role of X-ray as Diagnostic Tool in the National Tuberculosis Control Programme at the 12th Karnataka State TB & Chest Diseases Conference held at Bidar, Karnataka.

Sl. No.	Faculty	Period	Details
4	Dr Preetish S Vaidyanathan, SMO	4th & 5th January 2002	Delivered a talk on "Problem of TB (epidemiological aspects) and Tuberculin Test" at the 12th Karnataka State TB & Chest Diseases Conference held at Bidar, Karnataka.
5	Mr KP Unnikrishnan, CSO; Mrs VN Saroja, Sr PHN; Mr BA Shivashankara, HV	4th & 5th January 2002	Participated as panelist in the panel discussion on "Organization of NTP & RNTCP at the 12th Karnataka State TB & Chest Diseases Conference held at Bidar, Karnataka.
6	Mr KP Unnikrishnan, CSO	4th & 5th January 2002	Delivered a talk on 'Recording, Reporting & Supervision of National TB Programme' in the 12th Karnataka State TB and Chest Diseases Conference held at Bidar, Karnataka.
7	Dr (Mrs) Sophia Vijay, Sr TB Specialist; Dr VH Balasangameshwara, CMO	14th to 16th January 2002	Participated in the International symposium on current development in Drug Discovery for Tuberculosis held at National Science Seminar Complex, Indian Institute of Science, Bangalore, Organized by Astrazeneca Research Foundation, India. The Global Alliance for TB Drug Development and World Health Organization Tropical Diseases Research.
8	Dr B Mahadev, CMO	28th January 2002	Briefed the staff of Microbiology Department of St. John's Medical College, Bangalore on Role of Smear Microscopy under RNTCP held at St. John's Medical College, Bangalore.
9	Dr (Mrs) Prabha Jagota, Director	29th January 2002	Attended the meeting of the Academic Council of the Rajiv Gandhi University of Health Sciences, Karnataka in their Syndicate Hall, 4th T Block, Jayanagar, Bangalore.
10	Dr VH Balasangameshwara, CMO	2nd February 2002	Participated in the Annual Symposium of Indian Association of Medical Microbiologist (IAMM), Karnataka chapter organized by IAMM, Karnataka chapter and Bangalore Medical College.
11	Dr VK Chadha, Sr.Epidemiologist	5th & 6th February 2002	Participated in the Joint meeting of WHO/GOI Collaborating centres (WHOCC) in India held at Jaipur.
12	Dr L Suryanarayana, Director in charge; Dr B Mahadev, CMO & Dr VH Balasangameshwara,CMO	17th February 2002	Participated in the CME on TB -HIV for Medical Officers of Mysore organized by District TB Centre, Mysore at Indian Medical Association Mysore.
13	Dr (Mrs) Chitra Nagaraj, CMO	26th February 2002	Attended a clinical session on DOTs services being provided by the hospital at St. Martha's Hospital, Bangalore.
14	Dr L Suryanarayana, Director in charge	13th March 2002	Delivered a talk on RNTCP at the urban Health Research Institute, Vyalikaval, Bangalore to the para medical workers working in the city corporation of Karnataka.
15	Mr R Jitendra, Computor	4th to 12th March 2002	Attended training on VB-6 at Computer Maintenance Corporation, Bangalore.
16	Mrs Sudha S Murthy, Sr Librarian & Mr Nandish Prasad, Computor	8th to 10th March 2002	Attended three days workshop on "E-Publishing of Scientific Information" held at Indian Institute of Science, Bangalore.
17	Mr KP Unnikrishnan, CSO; Miss PA Mini, Statistical Officer	21st March 2002	Attended the Karnataka State TB Co-ordination Society meeting held at MS Building, Bangalore.
18	Dr B Mahadev, CMO	31st March to 5th April 2002	Attended a Workshop on Excellence in Scientific writing held at Tuberculosis Research Centre, Chennai.

Sl. No.	Faculty	Period	Details
19	Dr Preetish S Vaidyanathan, SMO	1st to 5th April 2002	Participated in workshop on Excellence in Scientific Writing Course held at TRC, Chennai.
20	Dr VK Chadha, Sr.Epidemiologist, Dr Preetish S Vaidyanathan, SMO	12th April 2002	A meeting chaired by Dr VK Chadha, Sr Epi., was attended by Dr Preetish S Vaidyanathan, SMO, officials from TRC, Chennai, present and former staff members of NTI, to discuss the results and methodologies of analysis of the NSS-ARI Survey in North and South zones was held at NTI, Bangalore.
21	Dr VK Chadha, Sr.Epidemiologist Mr KP Unnikrishnan, CSO	19th April 2002	Attended Consultative meeting on Census Data Dissemination Strategy held at Kendriya Sadan, Bangalore.
22	Dr Prahlad Kumar, Director	30th May 2002	Attended a review meeting at DGHS, Nirman Bhavan, New Delhi, to review the Research Protocols for the Baseline Studies on Acceptability and Utilization of RNTCP services by special groups (women, SC/ST and people living with HIV/AIDS).
23	Dr L Suryanarayana, CMO (NFSG)	9th June 2002	Attended as faculty member the CME for the Consultants and Faculty of Medical Colleges on RNTCP held at Calicut,
24	Dr L Suryanarayana, CMO (NFSG)	16th June 2002	Attended as faculty member the CME for the Consultants and General Practitioners on RNTCP held at Udupi (North Canara).
25	Dr L Suryanarayana, CMO (NFSG)	21st June 2002	Attended as faculty member the CME for members of the Indian Medical Association of Nelamangala Branch.
26	Dr VH Balasangameshwara, CMO (NFSG)	27th June 2002	Delivered a lecture on the technical aspects of TB & HIV positive patients to the participants (DTO's of Karnataka) of the orientation training held by Karnataka state and AIDS Prevention Society, Bangalore.

SUPERVISORY VISITS

Visits under NSS-ARI Survey Planning, Initiation and Supervision

Sl. No.	Place of Visit	Purpose	Name(s) of Officers / Officials	Period
1	Bardhaman	Supervision	Dr V K Chadha, Sr Epidemiologist	30th Dec 2001 to 4th Jan 2002
			Dr Preetish S Vaidyanathan, SMO	11th Mar to 16th Mar 2002
			Mr Sanjay Singh, FI	12th Mar to 27th Mar 2002
			Mr Joydev Gupta, FI	1st Jan 2002 to 30th April 2002
			Mr R K Srivasthava, FI	1st Jan 2002 to 30th April 2002
2	Ratnagiri	Supervision	Mr Jameel Ahmed,FI	8th Jan to15th Jan 2002
3	Cuttack	Planning & Initiation	Mr Lakshminarayana, Investigator	20th Jan to 18th Feb 2002
			Mr Jameel Ahmed,FI	16th Jan to 24th Apr 2002

Sl. No.	Place of Visit	Purpose	Name(s) of Officers / Officials	Period
3	Cuttack	Supervision	Dr V K Chadha, Sr Epidemiologist	17th Feb to 22nd Feb 2002
		Supervision	Mr Sanjay singh, FI	28th Mar to 14th Apr 2002
4	East District Sikkim	Initiation and Supervision	Mr V Magesh, Investigator	26th Apr to 30th Jun 2002
		Supervision	Dr V K Chadha, Sr Epidemiologist	8th May to 10th May 2002
		Initiation and Supervision	Mr Sanjay Singh, FI	26th Apr to 30th Jun 2002
5	Jalpaiguri	Supervision	Dr V K Chadha, Sr Epidemiologist	6th & 7th May 2002
		Initiation and Supervision	Dr Ramakrishna Goud, Contractual M.O	5th June to 30th June 2002
		Supervision	Mr Narayan Prasad Investigator	5th May to 24th May 2002
		Supervision	Mr Joydev Gupta F.I	1st May to 14th May and 2nd June to 30th June 2002
6	West Garo Hills	Planning	Dr Ramakrishna Goud, Contractual Medical Officer	9th to 13th June 2002

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IMPLEMENTATION STATUS AND PERFORMANCE OF REVISED NATIONAL TUBERCULOSIS CONTROL PROGRAMME IN INDIA DURING 1993-2002

KP Unnikrishnan[1], PA Mini[2] & PS Jagannatha[3]

Summary:

The Revised National Tuberculosis Control Programme (RNTCP) with Directly Observed Treatment Short-course (DOTS) strategy was begun on a pilot basis in 1993 with the help of WHO in five selected states in India covering a population of 2.35 millions. The expansion of the programme started in 1998. By June 2002, 49 percent of the population had access to high quality TB treatment. Owing to this rapid expansion, India now has the distinction of having the second largest health programme of this kind in the world after China. Along with the rapid expansion, it has sustained the excellent results. The diagnosis of cases through sputum examination has been given adequate emphasis. This aspect is reflected in the ratio of smear positive to smear negative cases in RNTCP, which was approximately 1:1. Under the DOTS strategy, more than 80% of patients have been successfully treated. Most notably, death rates among diagnosed TB case have dropped substantially compared to earlier programme. The challenge is to maintain the quality on the one hand, and on the other hand to continue the expansion of the programme to the remaining population and to improve the case finding from the current rate of 50-60% to at least 70%.

In spite of the implementation of National Tuberculosis Programme (NTP) since 1962, no significant epidemiological impact on disease situation has been observed. Every year, more than 2 million new cases are added and nearly 500,000 TB deaths occur. TB remains by far, the leading infectious cause of death in the country. The emergence and spread of HIV and drug resistant TB threatens to further complicate the TB situation. In the year 1992, the Government of India together with the World Health Organization (WHO) and Swedish International Development Agency (SIDA) reviewed the NTP in depth. The review brought out certain inadequacies in the programme, mainly on the methodology of diagnosis of cases as well as completion of treatment. The Revised National Tuberculosis Programme (RNTCP) was accordingly designed with a new management strategy in consultation with State governments and World Bank. It is based largely on research done in India in the field of TB over the past 40 years. The goal of RNTCP is to cure more than 85% of new sputum smear positive pulmonary TB patients and to achieve at least 70% detection of such cases. The RNTCP strategy shifts the responsibility for cure from the patient to the health system.

RNTCP builds on the very substantial strengths and accomplishments of NTP. The programme has created an extensive infrastructure for tuberculosis treatment and has raised public awareness on TB. The RNTCP was begun on a pilot basis in 1993 with the help of WHO in five selected states (Delhi, Kerala, West Bengal, Maharashtra and Gujarat) covering a population of 2.35 millions. Though RNTCP is also fully integrated with the overall health system, several managerial innovations including a fullproof recording and reporting system have been introduced. The State TB headquarters, State Tuberculosis Training & Demonstration Centres and the District Tuberculosis Centres were strengthened for efficient implementation of RNTCP. In addition, dedicated Tuberculosis Units (TUs) were established at the sub-district level, covering a population of approximately five lakhs. At the TU level, posts of one Senior Tuberculosis Supervisor (STS) and one Senior Tuberculosis Laboratory Supervisor (STLS) were newly created. A designated Medical Officer-Tuberculosis Control (MO-TC) is responsible for all the programme activities at the TU level. It has been ensured that the peripheral level medical officers coordinate closely with these three key staff in their area. The STLS is primarily responsible for supervising all the laboratory activities including checking of all sputum positive slides and at least 10% of sputum negative slides. The STS on the other hand takes care of Direct Observation of Treatment (DOT) and programme logistics. Directly Observed Treatment short course (DOTS) is the mainstay of RNTCP strategy. It has the 5 major components viz., (a) Political commitment, (b) Diagnosis of cases by sputum microscopy, (c) Adequate supply of the right drugs, (d) Directly observed treatment and (e) Accountability.

1. Chief Statistical Officer, 2. Statistical Officer, 3. Statistical Assistant, National Tuberculosis Institute, Bangalore - 560 003.

Population Coverage under DOTS

India has 35 states/union territories and nearly 600 districts with a population of 1027 millions in 2001. The programme was expanded to a population of 13.85 millions in 1995 and stepped up to 20 millions in 1996. The scale of expansion was stepped up substantially since 1998. The coverage was increased by more than 100 millions population in 1998 itself. There has been more than 25-fold expansion in DOTS coverage after 1996 (Fig 1). By the end of June 2002, 49% of total population has been covered under RNTCP[2]. The states of Rajasthan, Kerala, Delhi, Himachal Pradesh, Tamilnadu, Manipur, Sikkim and UT of Chandigarh have achieved 100% RNTCP implementation by March 2002 (Table 1). More than 80% of the population of Gujarat and two third of the population of Maharashtra and West Bengal have been covered under DOTS already. For efficient implementation of the programme, a few high-populated districts having substantial urban population have been divided into rural, urban and municipal corporation areas. There were 248 RNTCP districts in all as of June 2002.

Fig 1: RNTCP expansion

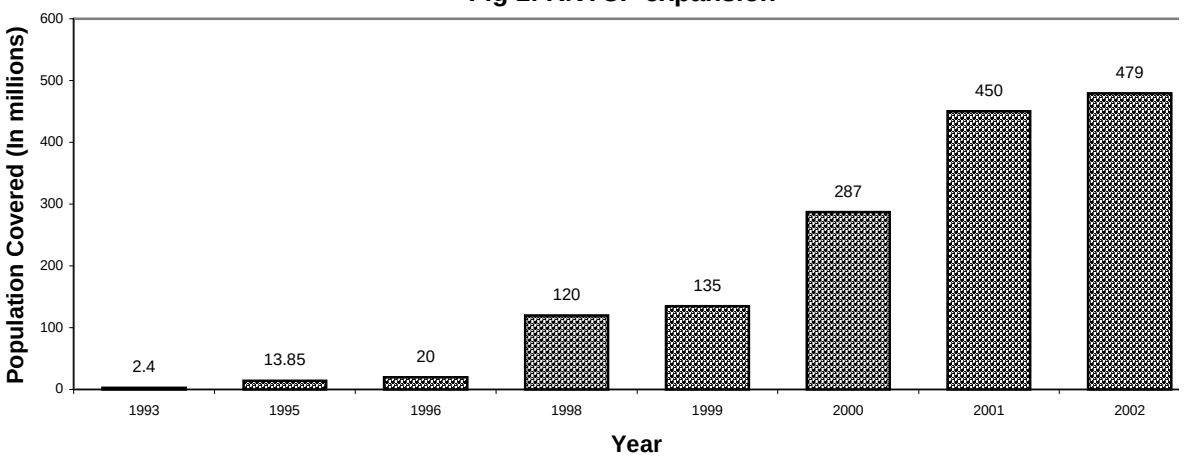


Table 1: Population covered under RNTCP by states as on second quarter 2002

State/Uts	Population in lakhs	Total No. of Disticts	No. of Districts implementing RNTCP	Population covered under RNTCP (%)
1. Andhra Pradesh	757	23	8	34
2. Assam	266	23	1	5
3. Bihar	829	37	3	14
4. Chandigarh	9	1	1	100
5. Delhi	138	20	20*	100
6. Gujarat	506	31	24*	95
7. Haryana	211	19	3	24
8. Himachal Pradesh	61	12	12	100
9. Jarkhand	269	18	2	18
10. Karnataka	527	28	11*	41
11. Kerala	318	14	14	100
12. Madhya Pradesh	604	45	5	11
13. Maharashtra	968	48	32*	76
14. Manipur	24	8	8	100
15. Orissa	367	30	14	38
16. Punjab	243	17	1	7
17. Rajastan	565	32	32	100
18. Sikkim	5	4	4	100
19. Tamilnadu	621	29	29	100
20. Uttar Pradesh	1660	70	9	12
21. West Bengal	802	18	15	90
Total	**9750**	**527**	**248**	**49**

* includes Municipal Corporation

Performance of RNTCP :

a) Case finding Activities:

The number of smear positives treated under DOTS in 2000 and 2001 were twice that of the corresponding preceding year, which was due to the rapid expansion in DOTS coverage. During the year 2001, 185178 smear positive patients were put on DOTS. More than seven lakh patients have been treated under RNTCP since 1993 (Table 2)[3].

Table 2 : Case finding under RNTCP from 1993-2001

Year	New			
	Smear Positive	Smear Negative	Extra Pulmonary	Total patients
1993	392	603	13	1008
1994	1060	1179	288	2527
1995	2144	1945	606	4695
1996	6365	6198	1814	14377
1997	7747	7129	2186	17062
1998	12354	11268	4015	27637
1999	53332	43783	16251	113366
2000	95091	75525	28440	199056
2001	185178	147515	52777	385470
Total	363663	295145	106390	765198

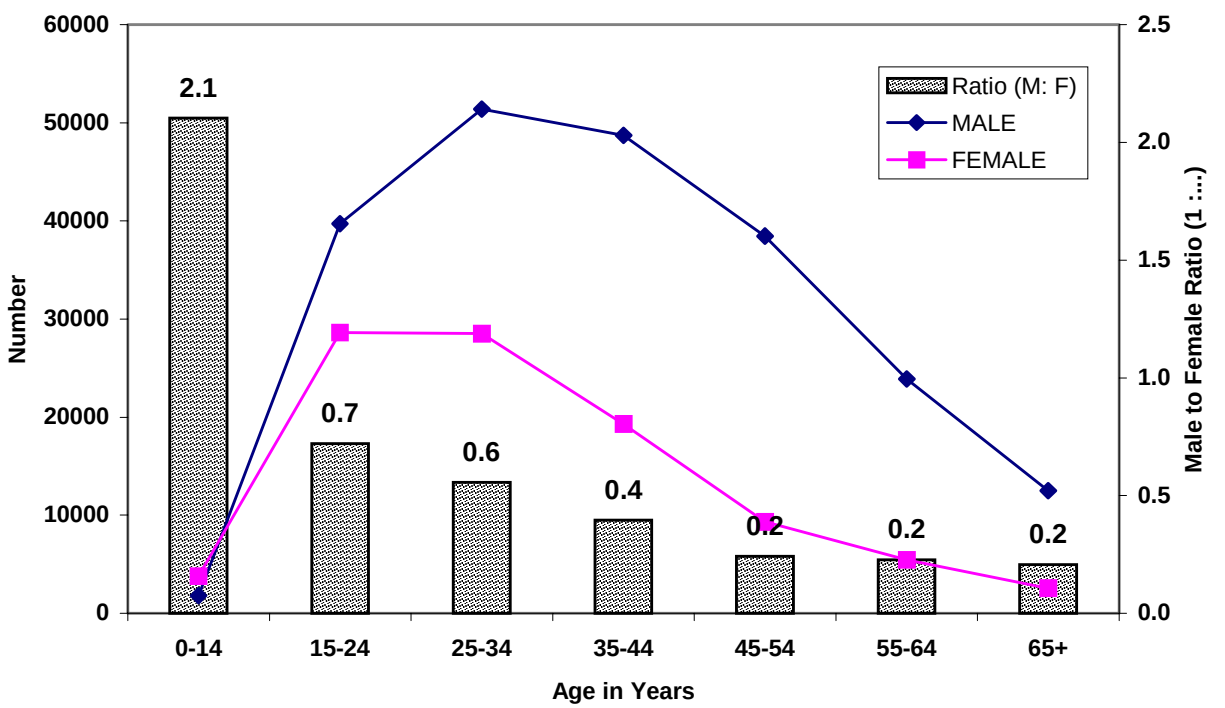
The total number of smear positive TB cases registered for treatment in the country during 2001 was 3,84,728 (NTP & RNTCP). In this, 48% of cases were under RNTCP.

b) Age sex distribution of Smear Positive cases :

Fig 3 depicts the age sex distribution of new smear positive cases treated under RNTCP during 1996-2001. It may be observed that male to female ratio was 1:2.1 in the age group of 0-14 years. This ratio has decreased drastically in the subsequent age groups. Overall male to female ratio in smear positive cases was 1: 0.5[4].

Majority of new smear positive cases detected belonged to the productive age group of 15-44 years. There has been a wide gap in the number of male and female smear positive cases in the age group 25-54.

Fig 2: Smear Positive Tuberculosis Cases according to Age & Sex from 1996-2001



c) Ratio of Smear Positive to smear negative Cases :

The ratio of smear positive to smear negative cases in RNTCP was approximately 1:1 in comparison to 1: 2 observed in NTP[5]. This shows that diagnosis of cases through sputum examination is given more emphasis and X-ray examination is used only as a secondary tool of diagnosis in RNTCP.

d) Treatment Success Rate and Detection Rate :

During 1996-2001, treatment success rate was observed to be around 84%, which is near to the RNTCP global target. It may be observed that smear positive case detection and the success rate achieved were nearer to the global targets even during the rapid expansion phase from 1999 to 2002 during which the coverage achieved was four fold (Fig 3). The case detection rates in RNTCP areas however were only 55-60% of the estimated new infectious cases, which is below the global target of 70%. The fully implemented states of Rajasthan, Delhi, Kerala & Himachal Pradesh are close to achieving the global targets (Fig 4)[2] in case detection and success rates.

Fig 3 : Smear Positive Case Detection rate & Treatment Success Rate during the year 1996-2002

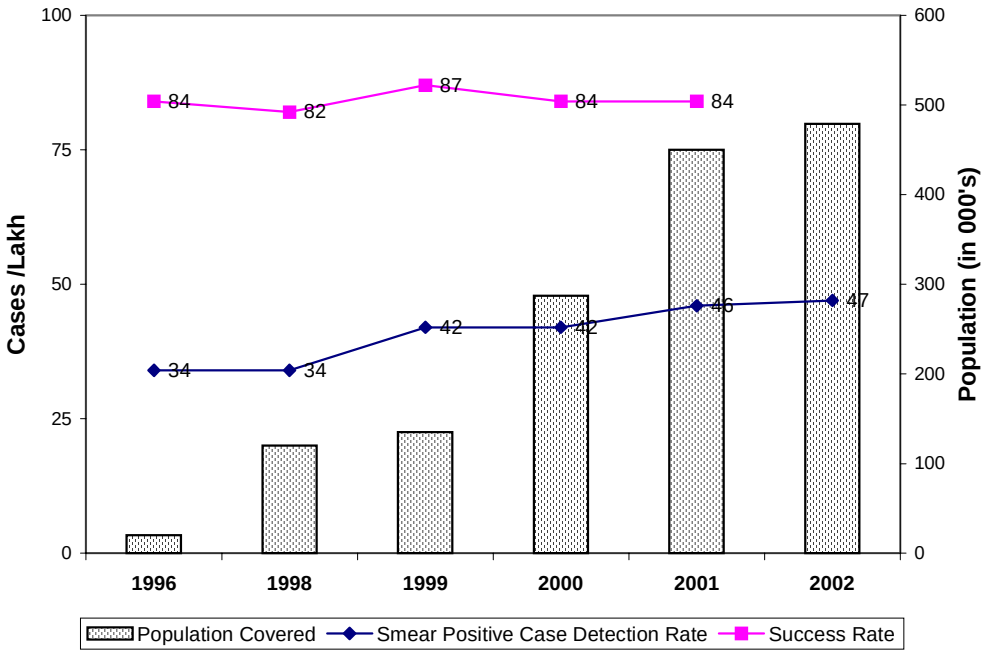
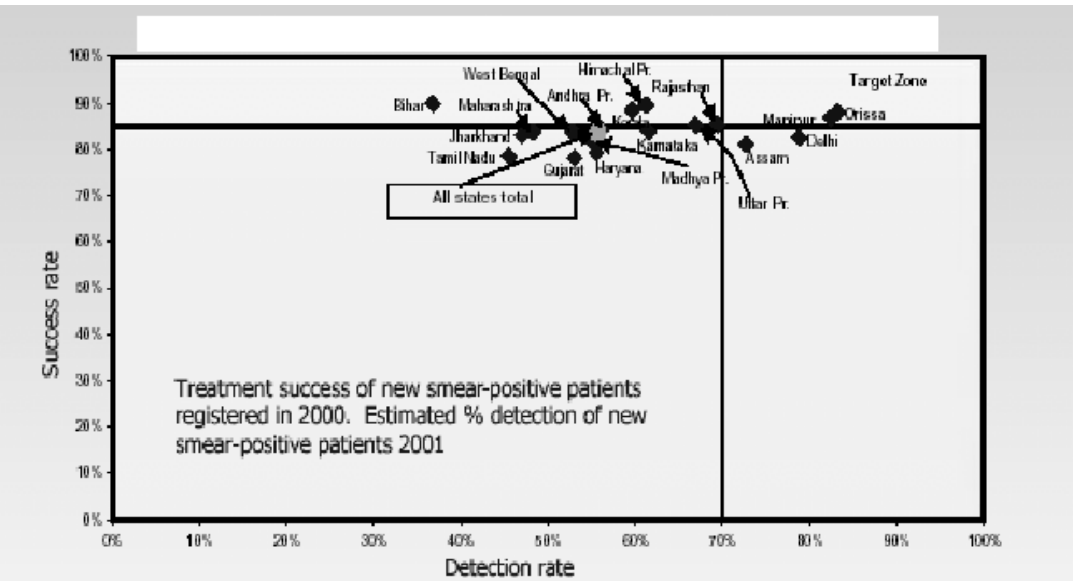


Fig 4 : Case-detection (2001) and treatment success rates (2000) in RNTCP areas



Review of RNTCP :

A joint review of the Tuberculosis programme was carried out, by a team comprising of the partners in financing and implementation in Feb.2000. The review found that the implementation of the RNTCP was successful with assured drug supply, accurate diagnosis and a striking increase in the proportion of patients cured. The review committee recommended to i) increase the effective political commitment, ii) expand the RNTCP to cover the entire population of the country by 2005, iii) decentralize the key aspects of implementation and monitoring of the programme to the states in a phased manner iv) increase intra and inter-sectoral coordination for the TB control and iv) optimize diagnosis and treatment of TB cases in areas not yet covered by the RNTCP[6].

Partnerships in Programme Management

An amount of Rs. 750 crores (Rs. 7.5 billions) was the cost envisaged for a period of five years for the project. A soft loan of US $ 142.4 millions has been negotiated with the World Bank for this project. Project funds are being released directly from the Union Ministry of Health to District TB Societies formed in the project districts. The releases of these funds are channelized through the state level TB societies in some states. These societies will also monitor and oversee the project implementation. Success of RNTCP is attributed to the co-ordination and participation of various national and international organizations. Technical guidance for implementation of DOTS is provided by WHO. About 70 local consultants have been deployed in different states to assist and oversee the programme management in the districts. The Department for International Development (DFID) has also been strengthening the implementation of the programme since June 1995. It has supported three RNTCP projects at Medak district in Andhra Pradesh, Nehru Nagar and Moti Nagar in Delhi. The DFID is now funding the RNTCP implementation in the State of Andhra Pradesh. Danish International Development Agency (DANIDA) on the other hand assists the RNTCP project in the state of Orissa. Government of India has joined hands with Non-Governmental Organizations (NGO), private sector, community health volunteers, armed forces, Medical colleges and railways for furthering the objectives of the programme. More than 300 NGOs have entered into agreement to serve as DOTS centers. RNTCP programme in India demonstrate how adequate resources can be mobilized effectively to address the Tuberculosis problem.

Conclusion :

DOTS is a systematic strategy which has five components. It envisages political and administrative commitment at all levels, starting from the national to district level and even below; good quality diagnosis using top quality microscopes; good quality drugs supplied in patient wise boxes; right treatment given in the right way (i.e. ensuring the consumption of drugs by the patients in the presence of a health worker or trained person who is not a family member) and systematic monitoring and accountability at all levels. The essential principles of DOTS are the products of India's long and distinguished tradition of tuberculosis research[7,8,9,10,11.] DOTS is the classic example of a research finding which could not be immediately applied where it was most needed and where it was originally discovered. Forty years after the discovery of the principles of DOTS in India, it has been adopted as a treatment strategy[12]. The performance reporting of the RNTCP districts are satisfactory and this reflects the quality of training given to the staff and monitoring. Under the DOTS strategy, more than 80% of patients have been successfully treated. The reported death rate of 4% in RNTCP areas is remarkably lower than the observed mortality in non-RNTCP areas, where 29% mortality[12] has been documented among smear-positive TB patients. After the introduction of RNTCP, there has been a marked reduction in the proportion of TB cases diagnosed on X-rays and the cure rate has almost tripled in comparison to the NTP. The challenges now facing the RNTCP are how to push towards nationwide DOTS coverage and to improve case finding from the current rate of 50-60% to at least 70% within areas where DOTS is already implemented without compromising the quality of service. To achieve this level of expansion and case finding, the programme will need to reach out to all clinics, dispensaries, and hospitals, including those in the private sector.

References :

1. World Health Organization: Tuberculosis Programme Review - India 1992; WHO, Geneva : 1992

2. TB India 2002 - RNTCP Status Report, Central TB Division, Directorate General of Health Services, Min. of Health & Family Welfare, New Delhi - 110 011.

3. Khatri GR & Frieden TR - The status and prospects of tuberculosis control in India, Int J Tuberc Lung Dis;2000; 4(3) : 193-200

4. Global Tuberculosis Control, 1998,1999,2000 http://www.Who.int

5. Unnikrishnan KP & Jagannatha PS - Performance of National Tuberculosis programme 1992-2001- A Report, NTI Bulletin, 2001,37/1-4

6. World Health Organization: Joint TB programme review India- Feb.2000; SEARO- New Delhi:2000

7. Tuberculosis in India - A Sample Survey 1955-1958. Special Report Series No.341, Indian Council of Medical Research, New Delhi, p.1, 1959.

8. Tuberculosis Chemotherapy Centre, Madras : A concurrent comparison of home and sanatorium treatment of pulmonary tuberculosis patients in south India. Bull World Health Organ 21: 51, 1959.

9. Fox, W Self administration of medicaments. A review of published work and a study of the problems. Bull Int Union Tuberc 31:307, 1962.

10. Tuberculosis Chemotherapy Centre, Madras. A concurrent comparison of intermittent (twice weekly) isoniazid plus streptomycin and daily isoniazid plus PAS in the domiciliary treatment of pulmonary tuberculosis. Bull World Health Organ 31: 247, 1964.

11. Baily, GVJ, Savic, D, Gothi, GD, Naidu, VB and Nair, SS Potential yield of pulmonary tuberculosis cases by direct microscopy of sputum in a district of south India. Bull World Health Organ 37: 875, 1967.

12. ICMR Bulletin: Directly Observed Treatment Shortcourse- Tuberculosis Cure for all, Vol. 31(3): March 2001.

13. Datta M et al: Critical assessment of smear positive pulmonary tuberculosis patients after chemotherapy under the District Tuberculosis Programme; Tubercle & Lung Dis 1993, 74, 180-186.

NTI Bulletin 2002, 38/1&2, 36-38,

MUSINGS FROM MY VISITS TO HARDOI AND JAUNPUR

Chitra Nagaraj*

Supervision of National Sample Survey to estimate Annual Risk of Tuberculosis Infection (NSS ARI) survey gave me an opportunity to see my country literally at the grass root level. But for the survey I would never have got a chance like this to see the remote villages in my country. Hardoi and Jaunpur were two of the three districts selected for the ARI survey in Uttar Pradesh. Hardoi is just 110 Kms. from the capital of Uttar Pradesh 'Lucknow' and Jaunpur can claim fame, by being just 40 Kms. away from the holy city of Benaras. Uttar Pradesh is one of the largest states of India and in terms of Indicators for Health it is the 'U' in the BIMARU list.

Compared to the Southern states, Uttar Pradesh is very backward in almost all aspects. The first thing which stuck me in Hardoi was, common people were walking with big guns on the roads at all times - at first this was a big shock. I have read and was also told caste and gang wars were common and people did not have faith in the law enforcing machinery. Such a sight was not seen in Jaunpur, might be the people are more peace loving there. As my visit to Jaunpur was during the Kumbh Mela, it was a sea of humanity everywhere. It was a sight to see such huge crowds on railway platforms, trains, buses and roads. It proved the saying in Tamil, which describes the crowds that 'the crowd was so much that even a grain of gingelly would not fall to the earth' and also I could now believe that India was really home to more than one billion people.

In the South one does not find many people walking on the highways, it is more of vehicular traffic, but this was not the case in Hardoi and Jaunpur, there were a large number of people on foot and on bicycles, along with the vehicular traffic. Also the roads leading to the villages were in very poor shape, almost non-existent and in monsoons their condition becomes even worse.

Working water pumps were in plenty. At least safe water had been provided to almost all the villages. Even the high ways were dotted with water pumps. The International Water Supply decade seems to have made some inroads in supplying water, but the sanitary conditions were very poor. It was a very pathetic sight to see line of women attending natures call, all along the Lucknow-Hardoi highway in the darkness of the night.

Power supply to most villages was not there and Television had not made its presence felt. Most of the villages had Kutcha houses. My impression was that the houses in the villages of Karnataka and Tamilnadu are much better. Sanitation also was very poor. According to the 2001 Indian census, literacy rates have shown good improvement both in terms of percentages and absolute numbers, but in the places I visited, after interacting with the people, I felt we still have to travel a long way to improve the literacy and health awareness. People still desired large families, many times it was ironical that mothers could not identify or remember the names of their own children! Personal hygiene and nutritional status of the children left much to be desired. The Government wants that each and every child born in India should receive all the immunizations in their first year of life. The Government is committed to this, but unfortunately more than 40% of the children were without BCG scars. We have entered the 21st century but have not been able to protect large numbers of our children. The Health workers have to work against all odds. They trudge long distances on foot carrying heavy luggage (registers, vaccine carriers etc.) under extreme and unpleasant climatic conditions. We should make them feel that they are doing a very important job, like the jawans protecting our borders, they are protecting the health of our people, their job is tougher because they are fighting against an enemy, which is invisible. Their contribution should be recognized, only then they would be motivated to do a better job.

There was still a silver lining in this bleak scenario. Unlike in the cities and bigger towns, I could not find any fat people in these villages. I could attribute this to the hard physical work these simple villagers were putting, and the lack of junk food in these parts. Lack of transportation made these

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villagers walk long distances, which also contributed in large measure in keeping them physically trim.

Unlike the city folk, the warmth and hospitality shown by these village people was tremendous. The hot boiled potatoes garnished with coriander and fresh sugarcane juice, which I had in Abbopur village in Jaunpur district was one of the tastiest foods I have eaten in my life. After an initial reluctance, the cooperation of these people in coming forward to get their children tested was very good.

The greatest resource in India is its people. India is not just Delhi, Kolkata, Chennai, Mumbai and few other big cities. The real India is in thousands of villages, like the ones I visited. Till now, I had only book knowledge of the condition of our villages and it seemed something very far off, the first had experience of visiting these villages and seeing their backwardness was very depressing. Five decades after independence, we have not been able to provide compulsory primary education, basic health care, safe water, basic sanitation, good roads and affordable and available transportation. TVR Shenoy in one of the issues of 'The Week' magazine quoted a politician "Jis din is desh ke log angrezi akhbar padne lagenge, tab se humko vote nahin milegi" so it serves the politician's interest to keep the large number of the people of this country illiterate and ignorant.

Everything is not bleak, inspite of being such a vast country with, so many religions, castes, languages and different cultures we have remained a united democracy, the elections are conducted in a fair manner, we have shown a lot of tolerance to this diversity and achieved more than our neighbour who also became independent at the same time. We have become self sufficient in food and also have enough reserve stocks, Life expectancy had gone up, Infant Mortality Rates have come down, we don't have epidemics like before, we have eradicated smallpox and Guinea worm and are on the verge of eradicating polio. If only, the people of this country get a 'LEADER' in the real sense, who can inspire the people and motivate each and every citizen to feel his/her job is very important and that he/she should do it sincerely and in a timely manner, we would be leaving for our children and grand children a wonderful Developed India.

एन टी आई बुलेटिन 2002, 38/1&2, 38-39,

मेरी हरदोई और जौनपुर भेंट के कुछ चिंतन

चित्रा नागाराज

ए.आर.आई सर्वेक्षण के पर्यवेक्षण ने मुझे अपने देश को अक्षरशः मूल स्तर पर देखने का अवसर प्रदान किया। बगैर इस सर्वेक्षण के, शायद ही मुझे अपने देश के इन सुंदर गॉवों को देखने का मौका मिलता । उत्तर प्रदेश में ए आर आई सर्वेक्षण के लिए चुने गए तीन जिलों में से दो हरदोई और जौनपुर हैं। हरदोई उत्तर प्रदेश की राजधानी लखनऊ से केवल **110** कि.मी. की दूरी पर है और जौनपुर प्रसिद्ध धार्मिक स्थल बनारस से केवल **40** कि.मी. की दूरी पर है। उत्तर प्रदेश भारत के बडे राज्यों में से एक है और स्वास्थ्य संकेत के आधार पर **BIMARU** सूची में **"U"** है।

दक्षिण राज्यों की तुलना में उत्तर प्रदेश सभी पहलुओं में अत्यंत पिछडा है। सर्वप्रथम हरदोई की इस बात से मैं चकित रह गई कि आम आदमी सडकों पर हर वक्त बंदूक लिए घूमते रहते है, जिसे देखकर मैं स्तब्ध रह गई। मैने पढा और सुना भी है कि जाति और गिरोहों से संबंधित संघर्ष यहाँ सामान्य हैं और कानूनी व्यवस्था में लोगों को विश्वास नहीं है। ऐसा दृश्य जौनपुर में नहीं देखा गया, प्रायः वहाँ के लोग ज्यादा शांतिप्रिय हैं। चूकि मैने कुम्भ मेले के दौरान जौनपुर की भेंट की, वहाँ सर्वत्र लोगों की भीड थी। रेल्वे प्लैटफार्मो, रेलों, बसों और सडकों पर की बृहत् भीड देखनेलायक थी। यह दृश्य भीड के वर्णन में तमिल के इस कहावत को सिद्ध करता है कि भीड इतनी थी कि तिल का एक दाना भी जमीन पर गिर नहीं पाया। साथ ही मुझे अब विश्वास हुआ कि भारत सचमुच एक अरब से अधिक लोगों का घर है।

दक्षिण में राजपथों पर अधिक लोग चलते नजर नहीं आते हैं, वह अधिकतर वाहनों के लिए है, किंतु हरदोई और जौनपुर की बात अलग थी, वहाँ वाहनों के साथ पैदल चलते तथा साइकिल पर जाते बहुसंख्यक लोग नजर आए। साथ ही गाँव की तरफ जानेवाली सडकें बहुत खराब हालत में थीं, प्रायः अस्तित्वहीन और बरसात के मौसम में उनकी हालत और भी खराब बन जाती है।

काम करते जलपम्प अनेक थे। कम से कम सभी गाँवों को शुद्ध जल उपलब्ध कराया गया था। राजपथों पर भी अनेक जलपम्प देखे गए। लगाता है कि अंतरराष्ट्रीय जल की आपूर्ति दशक के कारण सडकों पर जल की आपूर्ति हुई, लेकिन सफाई की व्यवस्था बहुत खराब थी। लखनऊ हरदोई के मार्ग पर रात के अंधेरे में शौच करती महिलाओं की कतर का दृश्य अत्यंत दयनीय था।

अधिकांश गाँवों में विद्युत की आपूर्ति नहीं थी और टेलीविज़न का ज्यादा प्रभाव नहीं था। अधिकांश गाँवों में कच्चे घर थे। मुझे लगा कि कर्नाटक और तमिलनाडु के गॉवों के घर काफी बेहतर हैं। सफाई का प्रबंध अत्यंत खराब था। अद्यतन **2001** की भारतीय जनगणना के अनुसार, साक्षरता दर के प्रतिशत और संख्या दोनों में उत्तम सुधार हुआ है, किंतु जिन जगहों का मैने दौरा किया, वहाँ के लोगों से बातचीत के बाद मुझे लगता है कि साक्षरता और स्वास्थ्य की जानकारी को सुधारने में हमें अभी लम्बा सफर तय करना होगा। लोग अभी तक बडे परिवारों की अपेक्षा रखते थे, कई बार यह व्यंग्यात्मक लगता था कि माताएँ अपने ही बच्चों का नाम याद नहीं रख सकती थीं व उन्हें पहचान नहीं सकती थीं ! बच्चों की व्यक्तिगत स्वच्छता और पोषण की स्थिति में काफी अभाव था। सरकार चाहती है कि भारत के प्रत्येक बच्चे को एक वर्ष की आयु के अंदर प्रतिरक्षण टीका दिया जाए। सरकार इस ओर प्रतिबद्ध है, किंतु दुर्भाग्यवशा **40%** से अधिक बच्चे बीसीजी निशान रहित हैं। हमने **21** वीं सदी में कदम रखा है लेकिन अपने अधिकांश बच्चों को बचाने में विफल रहे हैं। स्वास्थ्य कर्मियों को विषम परिस्थितियों में काम करना पडेगा। विषम तथा प्रतिकूल जलवायुविक स्थितियों में उन्हें भारी सामान (रजिस्टर, टीका-द्रव्य आदि) उठाकर पैदल लम्बी दूरियाँ तय करनी पडेगी। आवश्यक है कि हम उन्हें यह एहसास दिलाएँ कि वे एक अत्यंत महत्वपूर्ण काम कर रहे हैं, जैसे हमारी सीमाओं की रक्षा जवान कर रहे है, वैसे ही हमारे लोगों के स्वास्थ्य की रक्षा ये कर रहे है, उनका काम कठिनतर है, क्योंकि इनकी लडाई अदृश्य शत्रु से है। उनके योगदान को मान्यता मिलनी चाहिए, तभी उन्हें बेहतर काम करने की प्रेरणा प्राप्त होगी।

इस निरुत्साहजनक परिवेश में भी एक आशाजनक बात यह थी कि शहरों व बडे नगरों की अपेक्षा, इन गाँवों में कोई मोटा व्यक्ति मुझे देखने को नहीं मिला। प्रायः इसका कारण है, इन सरल गाँववालों द्वारा किया गया शारीरिक परिश्रम तथा इनका संतुलित भोजन। परिवहन के अभाव में इन्हें काफी पैदल चलना

पडता है, जो इनकी शारीरिक स्वस्थता का एक और ठोस कारण है।

शहरी लोगों की अपेक्षा इन गाँववालों ने जो स्नेह और आतिथ्य दिया वह अत्यंत आश्चर्य जनक था। जौनपुर के अब्बोपुर गाँव का धनिया लगे गरम आलू और ताजा गन्ने का रस मेरे जीवन का सबसे स्वादिष्ट खाना था। प्रारंभिक अनिच्छा के बाद अपने बच्चों के परीक्षण में इन लोगों ने उत्तम सहयोग दिया।

भारत का सबसे बडा संसाधन उसके लोग हैं। भारत केवल दिल्ली, कोलकत्ता, चेन्नै, मुम्बई तथा कुछ एक बडे शहरों में नहीं है। असली भारत उन हजारों गाँवों में बसा है, जिनमें से दो का दौरा मैने किया था। अब तक मुझे अपने गाँवों की हालत का किताबी ज्ञान ही था जो बहुत हटकर लगता है, इन गाँवों की भेंट से उनके पिछडेपन का जो प्रत्यक्ष अनुभव मुझे प्राप्त हुआ वह बहुत निराशाजनक था। स्वतंत्रता के पचास वर्षों के बाद भी हम उन्हें अनिवार्य प्राथमिक शिक्षा, मौलिक स्वास्थ्य व स्वच्छता की व्यवस्था, शुद्ध जल, अच्छी सडकें तथा कम लागत का परिवहन उपलब्ध नहीं करा पाए हैं। टी वी आर शिनॉय ने दि वीक पत्रिका के एक अंक में एक राजनीतिज्ञ के वाक्यों को उद्धत किया है जिस दिन इस देश के लोग अंग्रेजी अखबार पढने लगेंगे, तब से हमको वोट नहीं मिलेगी। अतः राजनीतिज्ञ चाहते हैं कि इस देश के अधिकांश लोग अशिक्षित और अज्ञानी बने रहे।

सब कुछ निराशाजनक ही नहीं है, अनेक धर्मो, जातियों, भाषाओं और विभिन्न संस्कृतियों से युक्त एक विशाल देश होते हुए भी हम प्रजातंत्र है, हमारे चुनाव न्यायिक ढंग से किया जाता है, इस विभिन्नता की ओर हमने अत्यंत सहिष्णुता दिखाई है और अपने पडोसी से, जो हमारे साथ साथ आजाद बना, ज्यादा उपलब्धियाँ हासील की है। खाद्यान्न में हम आत्म निर्मर बने हैं तथा पर्याप्त आरक्षित खाद्य संग्रह भी है, आयु सीमा बढ गई है, शिशु मृत्युदर घटी है, पहले जैसे संक्रामक रोग नहीं हैं, हमने चेचक और गिनीकृमि का उन्मूलन किया है और पोलियो उन्मूलन की स्थिति में है। हमारे देश के लोगों को वास्तविक अर्थ में अगर एक नेता मिले, जो उन्हें प्रोत्साहित कर सके और प्रत्येक नागरीक को प्रेरित करें कि उसका काम अत्यंत महत्वपूर्ण है और वह उसे निष्ठा के साथ समय पर करे, तो हम अपनी आनेवाली पीढियों को एक अद्‌भुत विकसित भारत दे सकेंगे।

NTI Bulletin 2002, 38/1&2, 40-44,

GLIMPSES OF MY FIELD EXPERIENCE IN THE NATIONAL SAMPLE SURVEY TO ESTIMATE ANNUAL RISK OF TUBERCULOUS INFECTION

Lakshminarayana*

I work as an Investigator/Team Leader in the Epedemiology Section which was given the task of conducting perhaps the most ambitious nationwide tuberculin survey planned in recent times. I was watching my section getting energized by both the Director and Senior Epidemiologist who were working over time to conduct the survey as per stringent schedule.

Field work of the survey began in the month of February, 2000 in Junagadh district of Gujarat State. I was lucky to participate as a trainer in the very first batch, which was sent to Junagadh. It was not easy for me to become a trainer. I really worked hard by studying all the materials required for the purpose. This gave me great insight into certain practical aspects of the survey, in which I was sure that I would also be sent for supervision.

I did not have to wait for long. The very next month, i.e. in the month of March 2000, I was asked to go to Rae Bareli (Uttar Pradesh) which was the first district selected for the survey in the North zone.

I was pleased that I would go to a nice place because Rae Bareli was ex-Prime Minister's Constituency. I expected it to be a place with a modern look with decent civic amenities. However, when I went there I was aghast with what I saw. I did not find anything worth mentioning other than a branch of Indian Telephone Industry (ITI) and a park named after late Indira Gandhi. Rae Bareli is full of narrow roads, congested houses with no proper drainage system. The district is also quite backward with agriculture being the main occupation of the people.

The schedule of our survey starts from pre-planning & planning followed by registration, testing and reading.

Pre-Planning

Dr VK Chadha, Sr Epidemiologist and the Chief Investigator of the survey visited Rae Bareli and met the state officials like CMO, DTO, ADMO, discussed the survey aspects to elicit their co-operation. In this connection he also met the Hostel Warden, Department of Rural Development (Govt. of UP) where we had accommodation for the field staff. He also accompanied us to search for private accommodation; sometimes DTO and Hostel warden have been invited for get-together party to develop harmony and necessary rapport with them.

He has visited the field till the completion of fieldwork. He has observed all the field activities and assessed each and every member's discipline, nature of work involvement, performance, honesty, commitment to the cause, team co-operation among each other, behavior with community, harmony with team leaders, team spirit and motivation. He has also observed the Team Leader's ability to organize the teamwork. During evenings he used to visit the camp to meet all the field staff & discussed many problems experienced by them and used to give further direction to team leaders to set right the problems within the framework of the rules.

I had two challenges to face - (i) to extract work from a newly trained team without field experience and (ii) to establish social rapport with local state authorities who were less serious and indifferent to attend to our basic requirements.

For instance, I made four visits to Chief Medical Officer's (CMO) office to get a permission letter to depute Auxiliary Nurse Midwife (ANM) Multi Purpose Workers (MPW) to assist our team. **I had to struggle hard even to get a vaccine carrier and refrigerator to preserve tuberculin used in the survey.**

Somehow, we got accommodation in a State Government Hostel. When we occupied the

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premises, it was full of dust. Toilets and bathrooms were filthy. Added to it, window glasses were broken and there was no electricity. We could not get sleep because of high temperature, mosquito menace and the traffic disturbance every now and then.

However, there was no water scarcity. We tried to get private accommodation but we could not succeed because we were 12 persons and needed two houses that too for only 3 to 4 months duration and also needed a place for vehicle parking. We faced these problems in almost all districts where survey work was conducted.

I had to use all my organizational skills to extract co-operation from the two BCG Technicians deputed from District TB Centre. In the beginning, I had to understand the local set-up and so I planned to take up two villages, which were not included in the selected list.

Planning

During planning, we found out the location of the selected clusters with the help of local health worker. I met Pradhan, Up-Pradhan, Social Worker and a few active youngsters in the village, Medical Officer In-charge of the concerned PHC/PHI, explained them our programme, requested for their co-operation and convenient date for testing. Since meeting the village leaders is mandatory, we made more than two visits to meet the leaders, as they were not readily available.

Registration

For house to house registration, we have to commence the census work in the selected lane using a rough sketch map prepared earlier by the planning team. The presence of Local leader and ANM/MPW is a must, since we are strangers to the villagers. Estimating the correct age from the illiterate villagers and many times without the head of the family was real Herculean tasks.

Tuberculin testing

It is done among children of 1-9 years age group by injecting 1 TU RT 23 with Tween 80 on the midvolar aspect of the left fore arm. Testing centre was set up adjacent to the selected lane and our target was to cover 85 children in a cluster. **Some of the children did not report to the testing centre** due to (i) long distance from their house, (ii) community feelings, (iii) different political backgrounds and (iv) personal problems.

At the testing centre, 98% of the parents were willing to give their consent to test the children. **Most of the children cried and screamed and were shaking their hands at the time of testing. Children were scared at the site of syringes and a few even ran away from the centre, because of fear psychosis.** However, distribution of chocolates attracted the children. We checked for the presence of the BCG scar on both the shoulders of the children before administering the test, since they would never allow us to examine them after the test because of the fear of being pricked again.

A few parents enquired about whether (i) we are using disposable syringes, (ii) children will get fever after test, (iii) they can bathe the children, (iv) any diet restriction etc. The team answered to all their queries politely. **After all community as a whole are masters and we are its servants**. In some clusters, we were able to meet our target just in two lanes while in some other clusters we were forced to move to the adjacent village.

When I went along with the testing team on a particular day, in the absence of Panchayat Leader and the ANM, the village that was dominated by a particular community blindly resisted for the setting up of testing centre. They were afraid that we had gone to propagate birth control and our tuberculin test may make their children childless in future. I, however, talked to them patiently and explained to them about our survey and to got their cooperation and achieved our objective.

Reading

I was thinking that reading would be easy because no pricking was involved. However, I found that children being children, a few ran away at the sight of us fearing that we would prick them again. We had to give high coverage and so it was not easy task to trace panic stricken and hiding children.

In one such instance, 20-25 eligible children

ran 1½ kms away from the village to hide. I spotted 2 smart boys, and made them leaders to bring back the children for reading, and I am happy to express that I succeeded in my effort.

Roads

Roads were very narrow, most of them were country mud roads and were very difficult to access. Even the inter-state connecting roads were bad. In rainy season vehicles could easily skid. **One particular day** I walked along with the team more than ½ km by carrying furniture, vaccine carriers, child cards and other miscellaneous materials to reach the rural cluster .

Team

The Contractual Health Workers who were appointed and trained at TRC Chennai were from the nearby district of Lucknow. They were honest, well behaved and hard working. However, at times they quarreled among themselves for petty reasons.

For instance, we used to carry drinking water to field every day. There used to be difference of opinion amongst them as to who should fill and carry the water. To solve this problem, I prepared a roster and they were asked to shoulder this responsibility in turns. I also constituted a mess committee. I used to conduct weekly meetings to have better interaction and understanding among team members.

The team has used every skill and its power to get the required number of children for testing. It was mandatory that day's work would end only after testing 85 children. The team had to go in hot sun and work throughout the day so that one cluster is completed. Added to this hard work, upon return from fieldwork, every member had additional task of filling of forms, sorting out child cards, filing of the cluster file and other work as required by the work instructions.

Nagpur

My second assignment was at Nagpur of Maharashtra State, which is a central city of India. It is also called Orange City. It was the first district of the East zone selected. What a contrast Nagpur was with its wide roads, buzzing shops, busy railway station, several industries, even an Ayurvedic medicine manufacturing plant, from Raebareli! When I saw Deekshabhumi and beautiful parks I felt astonished. Even the government authority was extremely helpful and extended their co-operation. In contrast to Raebareli not only the roads to the village were better, but somehow we could get the maximum co-operation from the community as well. I found that here everything was better organised and there was no lack of educated persons in any village I visited in the district.

Dr Authkar, the Chief Medical Officer, District TB Centre, was taking personal interest to oversee the smooth functioning of our survey. He deputed Mr Gajanan Jagatap, Senior Health Assistant, DTC to assist our team. I was astonished at **Mr Jagtap's** in-depth knowledge of entire district. He was well-experienced, honest and enthusiastic worker.

The field work in the district was organised and supervised by **Dr (Mrs) Pratibha Narang**, Professor and Head of the Department of Microbiology, Mahatma Gandhi Institute of Medical Sciences (MGIMS) Sevagram, Wardha. The team selected by her was extremely good and she was taking care to provide all requirements, so that the survey work could proceed without any problem. She had deputed **Mr Rajendra Naik** an eminent Team Leader who was an honest, well experienced and a capable person to organise the teamwork.

There was also **Mr AN Shashidhara**, Retired Investigator, NTI who was deputed to initiate the survey work. He introduced some new techniques in fieldwork to boost up the study. Being a very well read person and disciplinarian, he was always our friend, philosopher and guide. Though old in age he was always young in spirit.

Once I visited a rural cluster near Ramtek, a well-known religious place. In the absence of Local Health Worker/ANM/MPW for testing, the local people were unwilling for the tuberculin test. Again, the next day I made a second visit to the same cluster and negotiated with the village leaders but could not succeed. Later, we convened a meeting with a local religious leader and explained them the purpose of our programme and its benefits. Through him, we were able to convince the community and complete our work. Motivation by the team was excellent.

Team

The Contractual Health Workers who were appointed and trained at TRC Chennai were from a nearby district of **Nagpur** and **Wardha**. They were all graduates and a few were postgraduates. They were well determined, honest, disciplined and hard working Team. They lived in the camp like one family. They were professionals in fieldwork. I was surprised that they would not take their lunch without achieving their fixed target. I am happy to say that I have lead such a team.

Delhi

My third assignment was at Delhi. I went with **Mr Venkatachalappa**, Statistical Assistant to initiate and supervise our work in Delhi City, the capital of India. I was unusually scared when I saw in the cluster list the names of areas like Jumma Masjid, Chandini Chowk, Chanukyapuri, RK Puram, Sisganj, M.P Servant quarters, Jantar Mantar, Rastrapathi Bhawan servants quarters etc.

I wondered as to how our team would face the people living in big Bungalows, multistoried buildings and in narrow lanes in and around Jumma Masjid. I thought it was a challenging work for me, a great opportunity to prove my organizational skills and to develop self-confidence to do the survey work in urban areas. I was also inspired by **Dr VK Chadha, Sr Epidemiologist** and **Mr Shashidhar Savanur, Statistical Officer,** who visited Delhi for supervision of the survey. I gathered courage and made a plan of action for the team to face the people who were living in Juggis and Bungalows. Fortunately the team members belong to Delhi and **Dr SK Agarwal, Director of New Delhi TB Centre (NDTC)** helped by deputing two health workers to assist our survey.

I encountered the following additional problems there.

1. Addresses were not traceable in some clusters.

2. The fieldwork was hampered due to heavy traffic and by the Bandhs & Demonstrations held by various governmental/non-governmental organisations.

3. There used to be too many checking by traffic police. Big vehicles like Tata Sumo could not reach some clusters and we were forced to engage cycle rickshaws/auto rickshaws to reach the clusters.

4. In old Delhi, most of the selected clusters were very congested and we were even unable to set-up a testing centre.

5. There were too many commercial establishments and offices where almost no children available for registration.

6. While census taking, a few people spoke through microphones and refused to provide necessary information saying that they are busy and in few houses they asked us to visit again since head of the family / children were not available.

7. Admission was restricted in some of the posh areas, where watchman and pets came in the way of our registration.

8. In multi storied buildings lift facilities were not available, we were forced to climb up 6 to 7 storied buildings. It was a real challenge to achieve the planned target.

9. We took prior permission while doing testing in Parliament Street, President's servant quarters and a few apartments.

10. A few families refused tuberculin testing on pretext that their children may get fever and may have after effects and doubted about the testing ability of the team.

11. A few vigilant households checked the tubercu lin vials, syringes, study cards, authorization letters and identity cards to confirm about the authenticity.

Thane

My fourth assignment was at Thane of Maharashtra State. It is a vast district. The city of Thane with its apartments and commercial shops resembles Mumbai. Local health worker **Mr Yeshwantha Rao,** retired District Health Supervisor was very helpful to our survey.

On one occasion when I went to **Mumbai**

airport along with Mr Rajendra Nayak, Team Leader to pick up **Dr Preetish S Vaidyanathan**, Senior Medical Officer (SMO) and the Co-Investigator of the survey on the way police caught our vehicle and ceased the documents. We were forced to pay the fine and collect back our vehicle. A rich experience indeed. This was a lesson, which made me to be extra careful while hiring the private vehicle.

On another occasion while collecting tuberculin vials from the airport, our consignment was checked by commercial tax authorities and they asked us to produce authorization slip and other documents.Dr Preetish, SMO convinced them by showing his identity card and the consignment was released.

To put it in a nutshell, through this survey I have developed self-confidence and my organisational skills have improved. As I was usually sent to supervise or initiate survey work in new districts like Raebareli (UP), Nagpur (MH), Delhi, Thane (MH), Purbhisingh Bhum (Jarkhand), Ratnagiri (MH), Cuttack (Orrisa), I had to develop additional communicational skills to maintain public relations with state authorities. Since I had to lead different teams, I slowly developed motivational skills. The challenges I faced in big cities like Thane, Nagpur and Delhi have made me fit to face any eventuality with a planned approach. Since most of the time I was living with the teams it gave me opportunities to develop team building and co-operative spirit.

I did not take this as a job to be performed because I held a job at the NTI, but something deeper in me appreciated the importance this ambitious project has to the nation. I am therefore indebted to **Dr (Mrs) P Jagota** Ex Director and **Dr VK Chadha**, Sr Epidemiologist of **NTI** for providing me this opportunity.

276. Delays in the diagnosis and treatment of hospitalized patients with smear positive pulmonary tuberculosis.

Yilmaz A, Boga S and Sulu et al, SSK Sureyyapasa Centre for Chest Diseases and Thoracic Surgery, Istanbul, Turkey : **Respiratory Medicine 2001, 95/10, 802-805.**

Tuberculosis (TB) remains one of the deadliest diseases and continues to be one of the major public health problem worldwide. Multi Drug Resistance (MDR) tuberculosis has also significantly added to this havoc. According to WHO, 8 million people suffer from TB and 3 million die every year. Among the different types of tuberculosis, smear positive pulmonary tuberculosis is of major concern. People who are exposed to these smear positive pulmonary tuberculosis cases, the medical personal involved in the treatment and follow up of the cases are at high risk of tuberculosis infection. Delays in diagnosis and treatment of tuberculosis among hospitalized patients and those who visit outpatient clinics have been reported.

Yilmaz et al, conducted a survey to study the different reasons for delays at SSK Sureyyapasa Centre for Chest Diseases and Thoracic Surgery. One hundred and thirtyfour hospitalized patients with smear positive pulmonary tuberculosis were selected for this study. Their clinical files were analyzed and a questionnaire was completed. Several intervals and delays were calculated. Median application interval was 17.5 days (95% confidence interval 21.3-32.4 days), median referral interval was 3.5 days (95% CI 6.8-11.4 days), median diagnosis interval was 3 days (95% CI 3.3-4.5 days) and median initiation of treatment interval was one day (95% CI 1.1-1.6 days). Patients delay was present in 28.4% of cases. The referral interval was longer than 2 days in 82 patients (institutional delay). 93 patients (69.4%) had delays in the diagnosis and 34 patients (25.4%) had delays in the treatment. There were doctors' delay in 119 of 134 patients (88.8%) and clinics' delay in 98 patients (73.2%).

The data thus collected suggested that hospitalized patients experienced several delays which in turn resulted in the increased rate of infection transmission. The authors have thus concluded that by preventing the delays, the transmission of infection can be greatly reduced and thus improve the tuberculosis control programme.

277. A preliminary study of the influence of HIV infection in the transmission of tuberculosis.

Mohammad Z and Naing NN, Department of Community Medicine, Universiti Sains Malaysia; **Southeast Asian J Trop Med Public Health, 2002, 33/1, 92-98.**

Tuberculosis is the most dreaded disease of the mankind, claiming 3 million lives each year. With HIV also on steady rise, more lives are being claimed. The deadly combination of HIV- TB is playing a major havoc. The potential of HIV-associated TB patients to transmit M. tuberculosis and to produce secondary increase in TB morbidity is unknown. If alterations in the TB mediated by HIV infection result in increased transmission or behavioral factors result in the exposure of more contacts or if HIV infection is prevalent among the contacts themselves, then there is the potential for accelerated epidemic spread. It is not known whether these phenomena were due to the increased infectiousness of the index cases or enhanced susceptibility of the contacts or both.

This study was therefore conducted to identify the influence of HIV on the epidemiological transmission of TB and to compare the prevalence of M. tuberculosis infection among the household contacts of HIV positive and HIV negative pulmonary tuberculosis patients. Records of tuberculin tests administered during routine contact investigations at the Chest Clinic Hospital, Kota Bhanu, from 1999 to 2000 were reviewed. The HIV status of the patients was based on the results of ELISA tests. The information on household contacts was gathered during visits to their homes. Ninetyfour contacts of 39 HIV positive patients, and 44 contacts of 17 cases of HIV negative patients were included in this preliminary study. Thirty percent (12/40) of the contacts of HIV positive TB cases had a positive tuberculin reaction compared with 52.8% (47/54) of the HIV negative patients. The difference was still significant after performing multivariate logistic regression analysis to HIV negative adjust for variables associated with informed of TB. The results showed that HIV infected pulmonary TB patients were less infectious to their contacts than HIV negative patients.

The authors intend to continue and extend study as a multi-centered study until an adequate sample size has been obtained.

278. Comparison of Microplate hybridization with Gel

Electrophoresis and Dot Blot Hybridization for the rapid detection of Mycobacterium tuberculosis PCR products.

Tansuphasisiri U et al, Department of Microbiology, Mahidol University, Bangkok, Thailand; **Southeast Asian J Trop Med Pubic Health, 2002, 33/1, 136-146.**

The importance of Tuberculosis as a global public health concern has been emphasized by the high incidence rates and the recent outbreaks of multi drug resistance Tuberculosis (MDR TB), particularly in HIV positive individuals. Thus resurgence of TB has stimulated the development of a large number of molecular diagnostic procedures for the rapid diagnosis of TB, including numerous methods based on the PCR and other amplification methods. The authors in a hope to develop a possible alternative assay that would be reliable for the rapid detection of Mycobacterium in sputum specimens, have developed and optimized a Microplate ELISA hybridization assay for the detection of the IS6110 PCR products of Mycobacterium tuberculosis. The efficacy of the assay was further evaluated by comparison with agarose gel electrophoresis (AGE) and Dot Blot Hybridization (DBH), using acid-fast staining and culture as the gold standard for the diagnosis of TB.

One hundred ninety sputum specimens of newly diagnosed TB patients were selected for the study. The DNA from these sputum specimens were extracted. DNA of Mycobacterium tuberculosis H37 RV and Mycobacterium flarescens ATCC 230 3b were used as positive and negative control. TB1, TB3 and TB5 were used as primers. The DNA was amplified by PCR and then detected by AGE and DBH as well as by Micro plate ELISA hybridization. The PCR results detected by ELISA and AGE showed close agreement, with sensitivity, specificity and accuracy of 90%, 100% and 96% respectively. The same values for DBH were 92%, 98% and 96% respectively. The validities of these methods were not statistically significantly different. The agreement rates of PCR produced detection by AGE comparing with DBH or ELISA hybridization 10 pg to 1pg of purified DNA/reaction; that is from obtained 30 to obtained 3 organisms. The amount of PCR production detected by ELISA was only one half of that detected by other methods.

The final advantages of the Micro plate assay over AGE and DBH include rapidity, ease to use, greater safety, and cost effectiveness. The authors opine that this technique is suitable for use in epidemiological studies for the analysis of large number of samples, in less time.

279. Clinical aspects of tonsillar tuberculosis.

Srirompotong S et al, Department of Otolaryngology, Faculty of Medicine, Srinagarind Hospital, Khon Kaen University, Khon Kaen, Thailand: **Southeast Asian J Trop Med Public Health, 2002, 33/1, 147-150.**

During the pre-chemotherapy age, 6.5% of all tonsils, removed from asymptomatic patients were infected with tubercle bacilli. The infection was usually due to Mycobacterium bovis which was present in the consumed infected milk. With the advent of ATT and pasteurization of cow's milk a considerable reduction is seen.

The pathological database of 6 patients from Srinagarind Hospital were selected for this study. The subjects comprised 3 men and 3 women in the age group of 20-74 years. All the patients presented with a sore throat and 5 showed caseous granuloma with positive AFB and one showed chronic granulomatous inflammation with negative for AFB. Four of the six patients had pulmonary tuberculosis. The 3 patients who received complete ATT were cured.

Tonsillar TB commonly presents with a sore throat and cervical lymphadenopathy. This presentations as well as the common abnormal tonsillar finding, make it difficult to differentiate tonsillar tuberculosis from a malignant tumour. Since AIDS patients are prone to Mycobacterium tuberculosis infection and an increased number of extrapulmonary tuberculosis infection the authors recommend that a chest X-ray and HIV screening should be conducted whenever a patient is diagnosed with tonsillar tuberculosis.

280. Tuberculosis osteitis of skull; A case report.

Agarwal N et al, Dr Ram Manohar Lohia Hospital, New Delhi: **Ind J Tub, 2002, 49, 105-106.**

Tuberculosis is a disease commonly affecting the lungs. However, the infection of skull though not frequent does occur and is quite deadly. The disease affects bones and is quite deadly. The disease affects bones in 1% of cases and involvement of skull occurs in 0.2%-1.37% of these.

A female aged about 30 yrs, with low-grade fever and dry cough for one month was taken up for the study. She had been prescribed several antibiotic courses. 15 days after the symptoms, she noticed a

gradually increasing swelling in scalp, following a minor trauma. It had a smooth surface, well-defined margins and there was loss of hair over the swelling. The routine chest roentgenogram was also normal. However Contrast Enhanced Computerised Tomography (CECT) of chest showed mediastinal and left hilar lymphadenopathy with internal necrosis, compression of bronchi. Although pulmonary parenchymal lesion was not seen, the findings were highly suggestive of extra pulmonary tuberculosis. The needle aspiration cytology examination of the swelling revealed an epithliod granuloma. On culture, the aspirate was positive for Mycobacterium tuberculosis. The patient was put on ATT and CECT of chest was done after 3 months and satisfactory progress was recorded.

Circumscribed tuberculosis osteitis of skull is a rare condition, often associated with trauma. Strauss was the first to review 223 cases of bone tuberculosis and observed that tuberculosis bone lesions occurred mainly in cancellous bones. Since flat bones of skull contain little cancellous tissue, there is comparative rarity of the disease in skull. Also, skull osteitis is often associated with tuberculosis elsewhere, example in lung, cervical lymph nodes or other bones.

Traditionally, surgical curettage was advised as a part of test, but now ATT alone is a treatment of choice.

281. Tuberculosis inpatients receiving prolonged treatment with oral corticosteroids for respiratory disorders.

Pal D et al, Department of Pulmonary Medicine, Post-Graduate Institute of Medical Education and Research Chandigarh: **Ind J Tub, 2002, 49, 83-86.**

With increase in number of collagen disorders arcoidosis, interstitial lung disease, asthma and other respiratory disorders there is and increase in the use of oral steroids. This in turn poses a danger of reaction of tuberculosis. These steroids by impairing the antibody production and CMI blunt the patient's response to infection.

The following study was taken up by Pal D et al, to evaluate the possible role of steroids in causing tuberculosis in patients with respiratory diseases that necessitate the use of systemic steroids over long periods. 143 patients taking oral steroids and 141 patients suffering from similar respiratory disorders but not requiring steroids were followed up for one year (20 cases on steroids were followed up for 2 yrs.) to study the incidence of tuberculosis. Seven patients (4.9.2) receiving steroids developed tuberculosis compared with none amongst the controls. Of these, 4 had pulmonary lesions, 2 had tuberculous pleural effusion and one were treated with standard anti-tuberculosis drugs; 6 patients improved whereas one died due to complications of the disease.

Steroids predispose patients to a variety of secondary infections including reactions of latent tuberculosis foci and reaction infection with Mycobacterium tuberculosis. These effects are most evident if steroid doses exceed 0.03mg/kg/day. Therefore, the authors conclude that it is worth considering whether patients who receive corticosteroids, should receive chemoprophylaxis for TB or not. It is perhaps better to follow such patients carefully to detect TB early and treat them accordingly.

282. Evaluation of PCR - based methods for the diagnosis of tuberculosis by identification of Mycobacterial DNA in urine samples.

Kaffwabulula. M, Ahmed. K, Nagatake. T, Gotoh. J; Department of Internal Medicine, Institute Of Tropical Medicine, Nagasaki University, Nagasaki, Japan; **Int J Tuberc Lung Dis; 2002; 6/8; 732-737.**

Tuberculosis remains a global problem today despite the fact that effective treatment has been available for over 50 years. The reason is that the accurate diagnosis of TB in adults and children remain difficult and in many cases the etiological agent M. tuberculosis is not detected by conventional microscopy or culture and treatment is commenced on emperical grounds. Culture on solid media requires up to 8 weeks of incubation to achieve the maximum growth. It has also been seen that HIV patients with pulmonary TB have a lower bacillary load in sputum. Furthermore, the diagnosis of TB in children is especially difficult, as they cannot easily produce sputum and clinical features are non - specific. Hence a need was felt for the development of more sensitive and specific tests for the rapid diagnosis of TB. The microbial examination of urine can yield M. tuberculosis on culture in patients with or without renal/ genitourinary or disseminated TB. As urine can easily be collected from patients of any age group and as it is a non-invasive sample, it could be used for the identification and diagnosis of M. tuberculosis. PCR being a rapid laboratory test, it could well be used for rapid diagnosis of TB and thus initiate treatment as quickly as possible.

For the above study, the authors collected the urine samples from 63 adult Zambian patients with culture - confirmed pulmonary TB. The early morning urine sample was collected and stored at -70^{0}C. The urine sample was then subjected to PCR by Sechi method and Githui method for the identification of M. tuberculosis DNA. The sensitivity and specificity of the two methods are as follows; the sensitivity and specificity of the Githui method were 55.6%(35/63) and 98.4%(62/63) respectively. The sensitivity and specificity of the Sechi method were 28.6%(18/63) and 98.4% (62/63) respectively.

Hence, the authors opine that neither of the two methods was sensitive enough to be recommended for routine use in clinical practice. They conclude that PCR - based assays for the detection of M. tuberculosis DNA in urine needs further refinement before they can be recommended for use in clinical practice in Africa.

283. Hepatotoxicity of tuberculosis chemotherapy under general programme conditions in Singapore.

Chee C.B.E., Teleman M.D., Earnest A. Wang Y.T., Department of Respiratory Medicine, Tan Tock Seng Hospital, 11 Jalan Tan Tock Seng, Singapore; **Int J Tuberc Lung Dis; 2002, 6/8; 699 -705.**

According to RNTCP, the ATT is for 6 months with two phases, the intensive phase and continuation phase. In the initial phase the regimen includes PZA, INH and Rif while in the continuation phase only INH and Rif is recommended. These drugs are highly effective in curing TB in almost all people. However, the most serious side effect attributed to these drugs is Drug - induced Hepatitis (DH). In 1998, three patients who were treated at Singapore TB Control Unit (TBCU) died of DH. This prompted the authors to conduct a retrospective study to determine the incidence, clinical course and outcome of TB, DH and the risk factors associated with DH under general programme conditions.

A total of 1036 patients who were started on ATT between 1st Jan and 31st Dec 1998 at the TBCU were selected for this study. Of these, 55 cases had DH. The median time for diagnosis of DH was 38 days. Factors significantly associated with DH were abnormal baseline transaminases/ bilirubin (or 2.1,95% CI 1.1 - 4.3, P = 0.02), age >60 years (or 1.97, 95% CI 1.14 - 3.34, P = 0.01) and female sex (or 1.9, 95% CI 1.07 - 3.4, P = 0.02). Ethnicity, self reported alcohol consumption and body weight were not associated with development of DH. All three patients with fatal DH had received PZA containing regimens. Treatment was reintroduced in 48 patients and successfully completed in 45 patients. The median time to reinstitution of TB treatment was 23 days.

The authors report that the overall incidence of TB - DH was 5.3% under general conditions and 80% during the initial two months of treatment. Risk factors for TB - DH were > 60 years, abnormal base - line transaminases / bilirubin and female sex. The authors also state that since then, they have been more judicious with the use of PZA among the elderly and in those with abnormal baseline transaminases / bilirubin, and more vigilant in monitoring for DH in these risk groups.

284. Shortening Short Course Chemotherapy: A randomized clinical trial for treatment of smear positive pulmonary tuberculosis with regimens using Ofloxacin in the intensive phase.

Tuberculosis Research Center, Chennai, **Ind. J Tub., 2002, 49/1, 27 - 38.**

One of the main hindrances to the success of TB Control Programme is the comparatively long treatment regimen of 6 - 8 months. Usually after the initial period (i.e. 2 months) the patients tend to lose interest in treatment programme. Alternatively if this SSC period is shortened further to say about 3 - 4 months or so, it would greatly benefit both the patient as well as the drug provider and help in the success of the TB control programme. A total of 529 patients who were HIV negative newly diagnosed sputum smear and culture positive pulmonary TB were selected for the study. These patients were allocated to one of the four regimens:

a) Oflaxocin, isoniazid (INH), Rifampicin (Rif) and Pyrazinamide (PZA) daily for three months.
b) Regimen (a) followed by INH and Rif thrice a week for one month.
c) Regimen (a) followed by INH and Rif twice a week for two months.
d) Oflaxocin, INH, Rif and PZA daily for two months followed by INH and Rif thrice a week for two months.

Of these 529 patients data for efficacy analysis was available for 416 patients only. The results up to 24 months after treatment are given below:

Only 4 (1%) patients with initially drug susceptible TB had an unfavourable bacteriological response (1 positive culture in the last 2 months of treatment) one patient in each regimen. Over a follow - up period of 2 years, 7 (8%) of 83, 3 (4%) of 81, 2 (2%) of 86 and 12 (13%) of 91 patients relapsed in regimens (a) through (d) respectively. Most (79%) of the relapses occurred in the 6 months followed the

cessation of treatment. Of the 47 patients with TB initially resistant only INH, 2(4%) had an unfavourable bacteriological response. At the end of the treatment, however bacteriological relapse occurred in 8 (19%) of 43 such patients who were assessed for relapse. Of 469 patients, 4 (3%) of 120, 6 (5%) of 115, 5(4%) of 118 and 3(3%) of 116 patients had an unfavourable bacteriological response at the end of the treatment. Adverse reactions were mainly observed in 31% (regimen d) to 44% (regimen c) of patients, but a majority of the reactions were mild and manageable with symptomatic measures. Only 5% of patients needed the modification of the regimen.

The authors opine that regimens are 4-5 months duration that contain Oflaxocin and other first line Anti TB drugs for three months can achieve high cure rate and low 24 months relapse rates in newly diagnosed patients with smear positive pulmonary TB without causing significant adverse reactions.

285. Behavior patterns of persons with chest symptoms in Karnataka state.

Nair S.S, Radhakrishna S., Seetha M.A., et al; **Ind. J Tub; 2002; 49/1; 39 - 48.**

The control of TB requires prompt diagnosis and effective treatment. The RNTCP aims to achieve effective treatment of TB using the DOTS strategy. However, mere administration of good treatment to diagnosed cases may not control the disease unless accompanied by efficient case finding. Since active case finding is impractible, it is important to diagnose promptly and correctly those who attend clinics spontaneously. Failure to do so could prolong their suffering and delay the commencement of treatment in active cases. While delays in diagnosis and initiation of ATT among diagnosed cases have been widely reported, information on the health - seeking behavior of chest symptomatic patients in the community is limited. Hence, a study was conducted in urban and rural areas of Karnataka where RNTCP based on DOTS was not yet implemented, to ascertain the time taken in seeking care among persons found to have cough of 3 weeks or more in the preceding 6 months and get details about the health care providers consulted, investigations under taken, and costs incurred.

20,000 people, both from rural as well as urban areas of Mysore and Raichur districts were interviewed. Prevalence of cough of any duration in the preceeding 6 months was nearly 6%. And 1.4% had cough for 3 weeks or more (Chest Symptomatic Persons - CS); 6% of households had at least one CS. Cough increased with age was more common in males and in the lower socio-economic groups. A vast majority (83 -90%) of CS had sought care, 2/3 within 2 weeks and 81% within 1 month of symptom onset. In the areas with a more extensive public health care provider system CS sought care more promptly, The median interval between onset and reporting for care being 8.8 days compared with 12.8 days in the areas with less extensive care provider system (P = 0.01). Private medical practitioners were the first providers sought by 65% of CS. Sputum examination was undertaken for only 35% of the CS over an average of 8 encounters.

Most CS seek care promptly, even where the public health care provider system is less extensive, most patients first seek care from private doctors, the reason being proximity to home, convenient working hours and a perception of good quality care. Only 1/3 of the patients had only a single sputum sample examined. Despite multiple encounters with the health system the authors conclude that apart from general health education priority should be given to the improvement in the diagnostic and treatment services in the health system.

286. Intracellular passage within macrophages affects the trafficking of virulent tubercle bacilli upon reinfection of other macrophages in a serum dependent manner.

McDonough K.A., Florczyk M.A., Kress Y.; Wadsworth Center, 120 New Scotland Avenue, New York; **Tubercle and Lung Disease; 2000; 80/6; 259 - 271.**

Even though TB is one of the oldest diseases affecting mankind it still remains unconquered. It is known to cause nearly 3 million deaths per year. Problems associated with TB control have increased dramatically over the last decade due to the emergence of Drug resistant tubercle bacilli and an unexplained synergy between M. tuberculosis and HIV. Macrophages play a key role in the control of M. tuberculosis infection but at the same time these cells can also support the growth of M. tuberculosis within the human host. Various bacterial survival strategies like inhibition of phagosomes acidification, inhibition of phagolysosomal fusion etc. have been reported. However, the means by which the virulent M. tuberculosis mediates many of these effects within macrophage have not been elucidated. Hence a need was felt for the better under standing of TB pathogenic process for the design of new anti microbial approaches and a more effective vaccine.

The following study was taken up with the main objective of determining whether prior passage with macrophages affects the behavior of M. tuberculosis upon reentry into other macrophages.

M tuberculosis H37Rv (ATCC #25618) attenuated M. tub H37Ra (ATCC # 25177) and M. bovis BCG (Pasteur strain, Trudeau Institute) were grown in 7H9 liquid media and J774 .16 macrophage were maintained and passaged twice weekly in J774 media.

The intracellularly and extracellularly passaged cultures of virulent and avirulent M. tuberculosis and M. bovis were made to re-infect the J774.16 macrophage which were pre labeled with inert thoria particles in presence of 20% heat inactivated FBS, 10% fresh negative PPD negative human sera. At 4 - 6 hours post infection the samples were washed fixed and processed for electron microscope.

Transmission electron microscope was used to monitor fission of bacterial phagosomes with late endosomal/ lysosomal compartments using thoria as a fluid phase marker. 2 - D PAGE was used to study bacterial protein expression with macrophage. H37Rv and BCG expressed novel proteins within macrophages. H37Rv also under went less fission after intracellular (IC) (24.2±7.7%) than extra cellular(XC) (67.4±5.5%) passage when the bacteria entered new macrophages in small cultures. These effects were inhibited by serum and were not observed with H37Rv or BCG bacteria (78.9±1.6 % fused for all conditions). In addition vacuoles, which contained single bacilli, were less likely to acquire markers (26.9±2.6%) than those that contained multiple bacilli (77.3±2.8%).

The authors conclude that phagosomes containing clumped Mycobacteria acquired fluid phase markers in a virulence associated and serum dependent manner. In contrast, fusion of vacuoles that contained single bacilli was consistently low. They also opine that modulation of M. tuberculosis fusion behavior within macrophages should facilitate identification of the bacterial factors that mediate this phenotype and help to clarify the precise mechanism and role of fusion inhibition to TB pathogenesis.

287. Role of Ayurvedic Drugs along with Anti Tuberculous chemotherapy in the management of Tuberculosis.

Katiyar S.K., Kackar R., Agarwal M., et al; Department of chest and tuberculosis, G.S.V.M. Medical college, Kanpur; **Pulmon; 2000; 2/1; 19 - 26.**

Antibiotics, which were considered as "MAGIC BULLETS", "WONDER DRUGS" etc. seem to have lost its charm in the present scenario. This is true in case of drugs used in ATT also. These drugs apart from killing the pathogen also adversely affect the immune system of the human host. ATT drugs are known to cause hepatotoxicity and immune suppression which interferes with the recovery of the patient. Hence, a need was felt for an alternative drugs/ therapy, which could kill the pathogen and at the same time not affect the human host. Ayurvedic Science has come as a boon in this situation.

A study was hence conducted by Dr. Katiyar S.K. et al to valuate the role of ayurvedic drugs as adjuvants to the Anti Tuberculous Chemotherapy. 100 cases of sputum smear and X - ray positive pulmonary TB cases and tuberculous adenitis, in the age group 14 - 60 years were selected for this study. None of the cases had Diabetes mellitus, HIV infection, deranged liver. These 100 cases were randomly divided into two groups I and II. Group I were given the drugs under trial - A & B having immuno modulation and hepatoprotective properties, acting synergistically and complimentarily to each other whereas those in Group II were given placebo. It was found that the clinical response in terms of regression of symptoms was better and faster in the group given the drugs under trial than the one in placebo along with Anti tuberculous drugs. The comparison of the composite showed that the patient on immuno modulator had quicker relief in their symptom; their appetite improved faster and the weakness too disappeared sooner than the placebo group and was found statistically significant. The immuno modulators also had effect on the regression in size of glands in tuberculous adenitis cases, which was quicker, and in this group none of the cases had increase in the size of the glands. The side effects also have shown significant differences between two groups. Patients on hepatoprotective and immuno modulators almost had none as compared to the other group, which had significant side effects to the extent that treatment had to be discontinued in 50% of the cases due to hepatotoxicity.

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SELECT BIBLIOGRAPHY OF INDIAN MEDICAL LITERATURE ON TUBERCULOSIS - 22 & 23

TB - GENERAL

1649. Unusual presentation of disseminated Tuberculosis
Munni R, et al.: **Ind Pediatrics, 2002, 39/1, 70-74**

TB EXTRA PULMONARY

1650. Tuberculosis cervical Lymphadenitis in HIV and Negative patients
Rajasekaran S et al : **Indian J TB, 2001, 48, 201-204**

1651. Tuberculosis of Calcaneum: A case report
Swain B et al: **Indian J TB, 2001, 48, 209**

1652. Pulmonary Nocardiosis mimicking pulmonary tuberculosis
Chopra V et al: **Indian J TB, 2001, 48, 211-213**

1653. Bilateral Breast Tuberculosis
Bedi US & Bedi RS : **Indian J TB, 2001, 48, 215-217**

1654. Tuberculosis of Tonsil with unusual presentation
Gupta KB et al: **Indian J TB, 2001, 48, 223-224**

1655. Extra - Pulmonary Tuberculosis - A Retrospective study
Gopal R et al: **Indian J TB, 2001, 48, 225-226**

1656. Miliary Tuberculosis with Bilateral Pneumothorax: A rare complication
Sharma N et al: **Indian J Chest Dis & Allied Sci, 2002, 44, 125-127**

1657. Tuberculosis osteitis of skull : A case report
Agarwal N et al : **Indian J TB, 2002, 49/2, 105-106**

1658. Elephantiasic lupus vulgaris mimicking lymphogranuloma venereum : A case report
Pandhi D et al : **Indian J TB, 2002, 49/2, 107-108**

1659. Multi-focal tuberculosis with multiple intracranial tuberculomas in a non-immunocompromised patient.
Basta M et al : **Resp. Med. 2001, 95, 841-843**

1660. Clinical aspects of tonsillar tuberculosis
Srirompotong S et al : **SEA J of Trop Med & Hyg 2002, 33, 147-150**

1661. Tuberculosis meningitis associated with urinary tract tuberculosis
Chotmongkol V & Kiertiburanakul S : **SEA J Trop Med & Hyg 2001, 32/2 , 394-396**

1662. Primary tuberculosis of middle ear
Gupta RC et al : **Antiseptic 2002, 99/7, 254**

TB IN CHILDREN

1663. Prevalence of Tuberculosis Infection in children below fourteen years in rural Haryana
Pattanaik D, et al.: **Ind Pediatrics, 2002, 39/1, 70-74**

MDR - TB

1664. Prevalence and Microbiology of MDR-TB
Paramasivan CN : **Proceedings of 7th round table conference held by Ranbaxy Science Foundation at New Delhi on 28th September 2000; p 57-66**

1665. Multidrug - Resistant Tuberculosis : Therapeutic Challenges
Sharma SK & Mohan A : **Proceedings of 7th round table conference held by Ranbaxy Science Foundation at New Delhi on 28th September 2000; p 67-91**

1666. Should tuberculosis programmes invest in second-line treatments for multidrug -resistant tuberculosis.
Rajesh G, et al: **Int J TB & Lung Dis, 2001, 5/12, 1078-1079**

1667. Increased incidence of Multi drug-resistant

Tuberculosis in Diabetic patients on the Bellevue Chest service, 1987 to 1997
Bashar M et al: **Chest, 2001, 120, 1514-19**

1668. Drug susceptibility profiles of Mycobacterium Tuberculosis isolates at Jaipur
Malhotra B et al : **Indian J Med Microbiology, 2002, 20/2, 76-78**

TB & HIV

1669. HIV - TB Interface
Hira SK, et al: **Proceedings of 7th round table conference held by Ranbaxy Science Foundation at New Delhi on 28th September 2000, p 47-55**

1670. Tuberculosis cervical Lymphadenitis in HIV and Negative patients
Rajasekaran S et al : **Indian J TB, 2001, 48, 201-204**

1671. Extra - Pulmonary Tuberculosis - A Retro spective study
Gopal R et al : **Indian J TB, 2001, 48, 225-226**

1672. Splenic tuberculosis and HIV - 1 infection
Pramesh CS et al : **Lancet, 2002, 359, 353**

1673. Epidemiology and Control Strategies
Narain JP et al : **Indian J TB, 2002, 49, 3-9**

1674. Clinical presentation and treatment of HIV - TB
Swaminathan S : **Indian J TB, 2002, 49, 11-16**

1675. Sentinel Surveillance for HIV Infection in Tuberculosis patients in India
Tripathi S et al : **Indian J TB, 2002, 49, 17-20**

1676. Current issues in HIV / TB Co-infection
Walia K : **Indian J TB, 2002, 49, 21-26**

EPIDEMIOLOGY

1677. Missed Opportunities for Diagnosis of Pulmonary Tuberculosis A study among rural patients seeking relief on their own under the Tuberculosis programme in India
Chakraborty AK et al : **Indian J TB, 2001, 48, 181-192**

1678. Problems in Estimating the Burden of Pulmonary Tuberculosis in India: A Review
Krishnamurthy MS : **Indian J TB, 2001, 48, 193-199**

ANNUAL RISK OF INFECTION

1679. Annual risk of Tuberculosis Infection
Chakraborty AK & Krishnamurthy MS : **Indian J TB, 2002, 49, 57-62**

BCG VACCINE

1680. Future Vaccines for Tuberculosis
Vijaya S : **Proceedings of 7th round table conference held by Ranbaxy Science Foundation at New Delhi on 28th September 2000; p 129-134**

1681. Clinical Spectrum of Tuberculosis in BCG Vaccinated Children
Sushma Bai S & Lekshmi Devi R : **Indian Pediatrics, 2002, 39/5, 458-462**

BACTERIOLOGY

1682. Tuberculosis: A Diagnostic Challenge
Vijayan VK : **Proceedings of 7th round table conference held by Ranbaxy Science Foundation at New Delhi on 28th September 2000, p 39-45**

1683. Evaluation of Diagnostic Tests
Alamelu Raja & Narayanan PR : **Proceedings of 7th round table conference held by Ranbaxy Science Foundation at New Delhi on 28th September 2000; p 93-112**

1684. A Clinico-Bacteriological study of Peripheral Tuberculous Lymphadenitis
Aggarwal P, et al : **JAPI 2001, 49/8, 808-812**

1685. Disseminated Tuberculosis with Ocular Tuberculoma and Disseminated Candidiasis in Acquired Immunodeficiency Syndrome
Mathew I, et al : **JAPI 2001, 49/8, 841-842**

1686. Serodiagnosis of Extra Pulmonary Tuberculosis using A-60 antigen
Anuradha S, et al : **J Com Dis 2001, 33/1, 12-16**

1687. Abdominal Tuberculosis affecting Lesser Omentum
Subhash HS, et al : **JAPI 2001, 49/8, 848-849**

1688. Rare co-existence of salmonella typhi and mycobacteria tuberculosis in a psoas abscess a case report
Anupma JK, et al : **Indian J Pathology &**

Microbiology, 2001, 44/4, 493-494

1689. Right side Pleural effusion and liver abscess of Tuberculosis origin
Dhar MC et al : **Indian J TB, 2001, 48, 219-221**

1690. Mycobacterium scrofulaceum : An isolate from pericardial effusion
Singh D et al : **Indian J TB, 2002, 49, 49-51**

1691. Microbial Pathogenesis: An insight into Mycobacterium Tuberculosis
Manjula S et al : **Indian J Med Microbiology, 2002, 20/2, 61-68**

1692. Paucibacillary Tuberculosis -A Retrospective study
Dam T et al : **JIMA, 2002,100/4, 231-233**

1693. Comparative study of Histopathology and Bacteriology in Genital Tuberculosis
Samal S & Gupta U : **Ind Med Gazette 2002, 136/3, 85-88**

1694. Comparison of different methods of assessing in vitro resistance of Mycobacterium tuberculosis to rifampicin
Paramasivan CN et al : **The Indian J Med Res 2001, 114/1, 187-191**

1695. A Comparative Evaluation of Elisa (A-60 Test) with FNAC and Mantoux Test in the Diagnosis of Tuberculous Lymphadenities
Ahmed Z, et al : **Ind Med Gazette 2002,136/ 2, 64-67**

1696. Drug susceptibility profiles of Mycobacterium Tuberculosis isolates at Jaipur
Malhotra B et al : **Indian J Med Microbiology, 2002, 20/2, 76-78**

1697. Evaluation of pleural fluid and serum MDA levels in differentiating transudative from exudative pleural effusions.
Gupta KB : **Indian J TB, 2002, 49/2, 97-100**

1698. Role of Anti-A60 IgG Antibodies in diagnosis of tuberculosis lymphadenitis
Ahmad Z et al : **Indian J TB, 2002, 49/2, 101-104**

1699. Rapid Diagnosis of tuberculosis using transcription mediated amplification
Shenai S et al : **Indian J Med. Microbiology, 2001, 19, 184-189**

1700. Clinical and morphological variants of cutaneous tuberculosis and its relation to mycobacterium species
Gopinathan R et al : **Indian J Med. Microbiology, 2001, 19, 193-196**

1701. Prevalence of acid fast bacilli in Ajmer : A retrospective analysis of eight year data.
Rathore RS & Gupta RC : **Indian J Med. Microbiology, 2001, 19, 217-218**

1702. Isolation rates of Non-Tuberculosis mycobacteria from Amristar
Agarwal A & Jindal N : **Indian J Med. Microbiology, 2001, 19, 230-231**

1703. Evaluation of a novel, two component, two step AFB cold staining method
Lt Col S Gokhale : **Indian J Med. Microbiology, 2001, 19, 233**

1704. Recent advances in diagnosis of pulmonary tuberculosis
Prabhu SB : **Ped Clinics India 2002, 37/2, 124-127**

DIAGNOSIS

1705. Recent advances in diagnosis of pulmonary tuberculosis
Prabhu SB : **Ped Clinics India 2002, 37/2, 124-127**

CHEMOTHERAPY

1706. Shortening Short Course Chemotherapy : A Randomised clinical trials for treatment of smear positive pulmonary Tuberculosis with Regimens using Ofloxacin in the Intensive phase
Tuberculosis Research Centre, Chennai : **Indian J TB, 2002, 49, 27-38**

1707. Correct prescription of anti-tuberculosis drugs
Prabhu RD : **Indian J TB, 2002, 49, 55**

1708. Tuberculosis in patients receiving prolonged treatment with oral corticosteroids for respiratory disorders
Pal D et al : **Indian J TB, 2002, 49/2, 83-86**

PHARMACOLOGY

1709. Development of New Drugs for Tuberculosis
Rattan A : **Proceedings of 7th round table**

conference held by Ranbaxy Science Foundation at New Delhi on 28th September 2000; p 113-122

DEFAULT / COMPLIANCE

1710. Role of Medication Compliance in Drug Treatment and Patient Care.
Veena Verma, et al : **Ind Med Gazette, 2001, 35/9, 310-16**

1711. Profile of Defaulting TB patients and the factors determining their non-complaint behaviour
Samanta BB : **Ind Med Gazette, 2001, 135/ 12, 407-410**

1712. Patient Compliance : The cornerstone of successful Therapeutics
Vasudev K & Hota D : **JAPI, 2002, 50/6, 803-06**

ADVERSE REACTIONS

1713. Rifampicin induced platelet dysfunction
Lt Col Varghese SJ, et al.: **Med J Armed Forces India, 2002,58/1, 87-88**

1714. Pyrazinamide induced photoallergy
Vikas M, et al : **Int J TB & Lung Dis, 2001, 5/11, 1075-1076**

1715. Prolonged fever during the treatment of pulmonary tuberculosis
Rosha D : **MJAFI, 2002,58/2,127-129**

1716. Death Associated with Rifampin and Pyrazinamide 2- month treatment of latent mycobacterium tuberculosis
Medinger A : **Chest, 2002, 121/5, 1710-12**

DRUG RESISTANCE

1717. Impact of initial Drug Resistance pattern on the maintenance phase of Short Course Chemotherapy with reference to the emergence of multi Drug Resistance
Rosha D & Kataria VK : **Indian J TB, 2001, 48, 205-207**

TB CONTROL

1718. Issues in tuberculosis control
Nagpaul & Chopra KK : **Indian J TB, 2002, 49/2, 65-66**

1719. Global status of tuberculosis control
Frieden TR : **Indian J TB, 2002, 49/2, 67-68**

1720. Revised National Tuberculosis control programme A success story
Jagota P : **Indian J TB, 2002, 49/2, 69 -75**

1721. Private sector inputs in RNTCP to maximise DOTS dividends
Trivedi SB : **Indian J TB, 2002, 49/2, 77-82**

1722. Estimation of cure, relapse and success rates of short-course chemotherapy in the treatment of pulmonary tuberculosis : A Meta-Analysis.
Satagopan MC et al : **Indian J TB, 2002, 49/2, 87-96**

RADIOLOGY

1723. A comparative study of chest radiographic features between HIV seropositive and HIV seronegative patients of pulmonary tuberculosis
Maj Debnath, J et al : **Med J Armed Forces India, 2002,58/1, 5-8**

SOCIAL BEHAVIOUR

1724. Behaviour patterns of persons with Chest Symptoms in Karnataka State
Nair SS et al : **Indian J TB, 2002, 49, 39-41**

Visitors

Padmashri Dr CP Thakur, Honourable Union Minister for Health & Family Welfare visited the Institute on 19th January 2002.

Dr BM Das, Director, Emergency Medical Relief (EMR) and Sri Jaswant Singh, Deputy Director (Admn.), DGHS, New Delhi visited the Institute on 2nd January 2002 on official inspection.

Mr Postma, Chief Adviser, DANTB, Orissa visited the Institute and Bacteriology Section on 28th February 2002.

Dr Anupam Pathni, WHO HIV/TB Consultant at NACO, New Delhi visited the Institute to participate in the sensitization workshop on HIV/TB on 19th March 2002 and delivered a lecture on HIV/TB to the Medical faculty and paramedical staff of the Institute on 20th March 2002.

Dr (Mrs) Sudarshan Kumari, Regional Advisor (Health Laboratory Services) WHO-SEARO visited the Institute on 20th June 2002 to review the activities of the Institute as a WHO collaborating centre on Tuberculosis Diagnosis Training and Research and to ascertain the feasibility of holding an inter country meeting on Multi Drug Resistance in TB by the WHO. She also visited the Bacteriology section and Library of the Institute.

Dr Shivlal, Additional Director General and Director, National Institute of Communicable Diseases, New Delhi visited the Institute. He was briefed about the activities of the Institute and taken round to various sections of the Institute. He was also briefed about the BSL facility being executed at Animal Model Research Unit of the Institute.

Professional Updates:

As a part of professional updating among the technical staff of NTI, Director in-charge initiated lecture programmes by technical staff from April 2002. This as a series was started with a lecture on " Determination of Sample Size" by Mrs Malathi V Joshi, Statistical Assistant. Mr Jameel Ahmed, Field Investigator gave a presentation on the basic concepts of epidemiology on 24th May 2002.

News :

Dr L Suryanarayana, CMO (NFSG) assumed office as Director in-charge on 13th February 2002.

Dr VH Balasangameshwara, CMO (NFSG) has been posted as in-charge, Bacteriology section with effect from 13th March 2002.

World Tuberculosis Day was observed on 24th March 2002. As a part of the celebration, orientation training was given to 38 Medical Officers working in Public Sector undertakings. The officers and staff of the Institute actively participated in the celebration.

Dr L Suryanarayana, Director attended a meeting on 29th and 30th April 2002 at Nirman Bhavan, New Delhi, to review the proposals on Operational Research Protocols submitted by the Administrative Staff College of India, Hyderabad and Institute of Health Management Research, Jaipur.

Dr Prahlad Kumar, formerly the Deputy Director of SAARC TB Centre, Nepal assumed charge as Sr TB Specialist with effect from 6th May 2002 and addressed the staff and requested for their support to work as a team.

Retirements :

Dr (Mrs) Prabha Jagota, Director retired from Government of India service on 31st January 2002 on attaining the age of superannuation.

Sri VV Narayanakutty, Cook retired from service on 28th February 2002 after attaining the age of superannuation.

Miss Padmalatha Krishnan, Stenographer Grade I retired on 30th June 2002 on attaining the age of Superannuation.

Transfer :

Sri P Sangeet Kumar, Senior Statistical Officer was transferred to this Institute on 10th January 2002 from the office of the Regional Health Office, Bangalore.

Promotion :

Sri R Ashok Kumar, Driver (Ordinary grade) was promoted to the post of Driver Gr. II with effect from 19th March 2002.

Postings :

Dr (Mrs) Chitra Nagaraj, CMO was posted as in-charge of Training section with effect from 17th April 2002.

DPC Meetings/Selection Committee Meeting :

Screening Committee meeting was held on 30th January 2002 to review ACP of Group 'C' & 'D' staff of the Institute.

Departmental Promotion Committee meeting was held on 19th & 20th March 2002 for promotion of Driver ordinary Grade to Driver Grade II.

Recruitment :

Sl. No.	Name of the Official	Designation	Group	Date of Appointment
1	Narayana Rao	Lower Division Clerk	'C'	23.1.2002
2	TN Nagaraju	Gardner	'D'	9.1.2002
3	J Tharuna Kumar	Dark Room Attendant	'D'	4.2.2002

Activities Of Hindi / Rajbhasha Implementation Committee :

Dr VK Challu attended the 1st quarterly meeting of Town Official Language Implementation committee meeting held on 31.1.2002.

Regular Training Time Table translated in Hindi. Routine work like preparing letters in Hindi and sending the same to DGHS was undertaken.

Rajbhasha implementation committee meeting was held on 23rd May 2002 with the Director and other members. The Director was briefed about the achievement of implementing Hindi during 2001-2002. Discussions were held with regard to:

i) Imparting training in Hindi to the new entrants.
ii) Appointment of Junior Hindi Translator and Hindi Typist.
iii) Conducting Hindi Seminars/Workshops for implementing official language at NTI.
iv) Procurement of bilingual Hindi software and
v) Obtaining the documents related to the training sent to DGHS, New Delhi for Hindi translation.

Minutes of the Rajbhasha implementation committee meeting held in May 2002 was prepared and sent to DGHS, New Delhi. Quarterly report for the quarter ending 31st March 2002 on progressive use of Hindi and Annual report for the year 2001-2002 were sent to DGHS, New Delhi.

Annual Programme for the year 2002-2003 and target for the implementation of official language (Ministry of Home Affairs) was circulated to various sections of the Institute for compliance.

NTI Bulletin 2002, 38/1&2, 57-58,

GUIDELINES TO CONTRIBUTORS

The NTI Bulletin (erstwhile 'NTI Newsletter') is introduced and developed by the National Tuberculosis Institute, as a media of exchange for the dissemination of information generated at local, regional and national levels and feedback of information between the Institute and TB programme centres as well as a teaching research and training institutions. The scope of the Bulletin allows publications on Epidemiological, Sociological and operational aspects of TB prevention and Control. Operational aspects include viz., treatment, case holding, case finding, defaulter retrieval and importance of motivation as health education component under Information, Education & Communication. It also publishes program information on RNTCP. This provides a forum for discussing the problems faced by them. This is an unpriced publication distributed as per the mailing list maintained in the NTI library.

Format of Communications

The communications can be sent on any of the following formats viz., editorial, original articles, field research/reports, case reports, practical applications, clinical problems, Field experience, Success stories, readers' write/readers' forum, view point and also as correspondence.

Submission of Manuscripts

It should be submitted (in MSWord doc format as e-mail attachment) online and hardcopy by post to the

The Editor,
NTI Bulletin,
National Tuberculosis Institute,
'Avalon', No.8, Bellary Road,
Bangalore - 560 003.

Preparation of Manuscripts

Manuscripts should be presented in as concise a form as possible, typewritten in double space on one side of good paper of A4 size.

Title page should contain the title of the article and a full list of all authors - the first name being that of the primary author. The name of the departments, institutions and research centres should be given in full. Abbreviations are not to be used.

The next page should contain an abstract of not more than 150 words providing clear information on the central question or hypothesis of the article. A brief note of the major results or conclusions of the study will be appropriate.

The text page is usually divided into :

Introduction :

This must state briefly the current state of the art and indicate the main objective for undertaking the study. Material and methods should be precise and clear. Statistical methods are to be clearly expressed.

The result portion should contain the usual tables and findings of the study. Tables are to be kept to a minimum. Figures or drawings if any should be clear and originals should be sent.

The discussion portion is the area for arguing the points of the articles and the results need not be repeated. The deductions should be logical and relate to other relevant studies. A brief conclusion/summary paragraph is helpful. Due acknowledgement is to be made and proper authority for quoting references and communications are to be included.

References :

All references should be cited in full and numbered in the order in which they appear in the article. Examples:

Article :

Singh V, Mathur US, Bhandari VM, Jain NK. Peak Expiratory and Inspiratory Flow rates: Comparative study of pink city Flow meter with Wright Flow meter. Lung India 1987; 4: 195-7.
(Authors, Title of article, Name of Journal, Year, Volume and inclusive pages)
In press
Sharma OP. Clinical Review. Pulmonary Eosino-

philia. Lung India. (In press).
Text book
Cotes JE, Steel J. Work-related Lung Disorders Oxford. Blackwell Scientific Publications 1987.

Article in text books

Crompton GK, Grant IWB, McHardy GJR. Bronchial adenoma In: text books J.Macleod: ed. Davidson's Principles and Practice of Medicine. 14th edition Edinburgh, Churchill Livingstone 1984; 262-3.

Abbreviations of Journal names are to be found in Index Medicus. Written personal communications, unpublished data and work under progress may be used in the text but not as references.

Material submitted is accepted on the understanding that it will be subject to editorial revision. Authors are informed about the revision of major nature only, though this cannot be guaranteed. Author will be supplied with a free copy of the journal in which his/her article is published. Full address of the author to whom the correspondence is to be addressed in this connection may please be mentioned.

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We, the undersigned, give an undertaking to the following effect with regard to our article entitled **"……."** submitted for publication in the NTI Bulletin.

1. The article mentioned above has not been published or submitted to or accepted for publication in any form, in any other journal.

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