Monitoring of Tuberculosis Control Programme: Recording, Reporting and Supervision

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Summary:

The national TB control programme has put in place a recording and reporting system to systematically evaluate the patient’s progress and treatment outcome, as well as overall programme performance. The system includes a laboratory register that contains a log of all chest symptomatics and patients who had a smear test done; treatment cards that detail the intake of medication and results of follow up sputum examination; and the TB register which lists patients starting on treatment and monitors their individual and collective progress towards cure. A health worker is responsible for supervising each administrative area or institution in the district and uses the district/sub district TB register to monitor the progress and treatment outcome of all patients in that district. This provides the district or local health chief with rapid feedback on programme performance in the district and allows for monitoring of the epidemic overall. Recording and reporting system allows for targeted, individualized follow up to help patients who may not be making satisfactory progress and rapid management assessment of the overall performance of each institution, district, state and national. There is a strong system of accountability and checks and balances that make false reporting of data difficult.

A good record/report demonstrates that services were provided to the patient and establish that services provided were necessary. Reporting is auditing of our own records. This helps the programme managers to evaluate the strengths and weaknesses of the system of TB case management.

1. Introduction

1.1 The basic objective of the recording and reporting system is to provide a ‘Management information system’ for better management of Tuberculosis Programme at national, state, district and subdistrict levels. The regular flow of information generated at various management levels assists the programme managers in assessing their performance against the expectations. The areas of non-performance and bottlenecks in programme delivery could be identified and evaluated for immediate remedial action.

1.2 An efficient monitoring system should have a standardised set of performance indicators. The indicators compiled on the basis of reports emanating from the field are compared with the expected values for assessing the performance. Once the monitoring indicators are standardised, the essential data required for compiling the indicators have to be identified. The proper implementation of the programme would also need documentation of several other details, especially of the patients. This calls for designing of appropriate forms or records at the most basic level. These records could be either patient oriented or management oriented. Standardised definitions of cases, disease classification, treatment regimen, treatment outcome etc. are very vital in designing basic records for the information system. A consensus on frequency of reporting and analysis is also vital for an efficient monitoring system. A three monthly quarterly reporting system has been adopted for the TB control programme in India.

1.3 A brief analysis of the programme performance in Karnataka during 2001 has been given towards the end of the paper.

2. TB Control Programme

2.1 The National Tuberculosis Programme (NTP) has been implemented in all parts of India since 1962. The National Tuberculosis Institute (NTI), Bangalore which was set up in 1960, played a major role in its formulation. Sustained research efforts of NTI, Bangalore and Tuberculosis Research Centre (TRC), Chennai helped in several operational improvements in implementation of NTP2-3,4,5,6,7. These institutions have also largely shouldered the burden of the heavy training...
requirements under the programme. ‘Recording and reporting’ was given vital importance since beginning which was basically a district based action plan under a District Tuberculosis Officer (DTO). The strengths and weaknesses of the programme were jointly evaluated by the Government of India (GOI) and the World Health Organization (WHO) in 1992. The review among other things concluded that despite the existence of a national programme, the accuracy of diagnosis of TB patients was still poor and that most of the diagnosed patients did not complete treatment. Based on the recommendations of the review team, the Revised National TB Control Programme (RNTCF) was initiated in 1993. The major thrust of the revised strategy was on Direct Observation of Treatment (DOT). Accountability by way of proper documentation and reporting of treatment services provided to each and every patient is another mainstay of the RNTCF strategy. After the pilot phase from 1993 to 1998, wide scale implementation of RNTCF with World Bank assistance began in late 1998.

3. Monitoring

3.1 Up to 1977, NTP was monitored by two designated Regional Centres i.e., southern and northern. In 1977, the entire monitoring responsibility was handed over to NTI, Bangalore. The responsibility of monitoring the RNTCP is vested with the Central TB Division, Directorate General of Health Services (Dte.GHS), Ministry of Health & Family Welfare, GOI. The technical responsibilities for research and training are shared by NTI, TRC and other central institutions under the overall guidance of GOI and WHO.

4. Tools of Monitoring

4.1 Using appropriate indicators is one way of measuring the achievement of patient oriented activities as well as programme management. The TB control programme has identified several indicators, the most important of which are as under:

A. Patient oriented
   a. Case detection rate.
   b. Proportion of chest symptoms among all OPD adult patients attending the health institutions covered under RNTCP.
   c. Proportion of new smear positive cases detected out of patients subjected to sputum smear examination.
   d. Ratio of smear positive to smear negative cases.
   e. Reported notification rate of new smear positive cases per lakh population per year.
   f. Sputum conversion rate at the end of intensive phase for smear positive cases (new relapses and failures).
   g. Treatment outcome for new smear positive cases, relapses and other re-treatment cases:
      i) Cure rate
      ii) Completion rate
      iii) Default rate
      iv) Failure rate
      v) Death rate
      vi) Transfer rate

B. Programme management oriented

a. Proportion of districts covered under the programme.
b. Proportion of supervisory visits at various levels.
c. Number of quarterly reports on case finding, sputum conversion, treatment outcome and programme management and logistics properly completed and received.
d. Proportion of drugs and other supplies consumed.
e. Proportion of slides accurately read as smear positive or smear negative.
f. Information on key personnel and equipment in position.

5. Basic records under TB Control Programme

5.1 For the compilation of the indicators enumerated above, the TB Control Programme has specified the following basic records:

A. **TB Treatment Card**: This is the very basic and most important document specified for patient documentation. This is prepared immediately after a patient is diagnosed and decided to be initiated on treatment. This card is maintained at the health unit separately for each patient where he/she receives treatment. It contains patient information about identification particulars, name of contact person, type of disease, name of the treatment centre, the category of treatment, administration of drugs, details of sputum examination and the treatment outcome. The health worker uses the treatment card for recording the progress of treatment and for follow up. The information contained in the
treatment card not only helps in management of the case but also is used in completing the TB register.

B. **TB Identify Card**: This is issued to the patient after he/she is initiated on treatment. This contains patient information as in the TB treatment card. The card also contains columns for dates for follow-up appointments and health education messages.

C. **TB Register**: This register is maintained at the Tuberculosis Unit (TU) level under RNTCP and at district level under NTP. The Senior Treatment Supervisor (STS) in RNTCP is mainly responsible for the maintenance and timely updation of this register. The TB register is updated periodically on the basis of information contained in the treatment cards. The patients are registered and assigned a TB number, starting with number one at the beginning of each calendar year. Each patient in the TU/district, therefore, is assigned a unique TB number for purposes of identification. In addition to the TB number, the TB register contains the patient details viz., date of registration, name (in full), address and gender, name of treatment centre, date of starting treatment, treatment regimen, disease classification, type of patient, details of sputum examination and treatment outcome. Information in the TB register helps in monitoring programme activities as well as in preparing the quarterly reports of the TU/district.

D. **TB Laboratory Register**: This is the record maintained by the Laboratory Technician (LT) in the Microscopy Centre (MC) responsible for sputum smear examinations of TB suspects and follow-up sputum smear examination. For each chest symptomatics examined for sputum smear microscopy the register would contain a row of information viz., laboratory serial number, date of examination, name, age, gender, name of the health unit which requested the examination, address for new patients, reason for examination (diagnosis/followup) and sputum smear examination results. The register will, therefore, have data on the number of suspect cases examined, number of smear positive cases detected and the number and results of smear examination at follow-up stages. The contents of the laboratory register are also a major input for the updation of TB register as well as for quarterly report preparation.

E. **TB laboratory Form - request for sputum examination**: This is the form sent with the patient (or sputum sample / smear) requesting for sputum examination. The bottom portion is filled by the LT after sputum examination. It contains patient information and also provides data on the number of days taken to collect three specimens for diagnosis and for giving the results by LT.

F. **TB Culture/Sensitivity Request/Report**: This is the request form for culture / sensitivity tests which are usually done at a central or reference laboratory. The results of the culture /sensitivity tests are also entered in this report along with the laboratory serial number.

G. **TB Referral/ Transfer Form**: This form is used while transferring a patient from one health unit to a health center in another TB unit or district. Apart from containing all patient information in the TB treatment card, it also contains name of the referring unit and the unit to which the patient has been transferred and a section to be sent back to the referring unit after he/she is registered in the new TU/district TB register. The transfer form also has a section for reporting the treatment outcome of the patient to the health unit from which he/she was originally transferred.

6. Reporting System, Analysis and Feed-Back

6.1 Reporting System:

A quarterly reporting system has been adopted for the NTP/RNTCP in India. The purpose of the quarterly reports is to monitor the programme activities and to evaluate the programme.

The following are the components of the quarterly report:

A. **Quarterly Report on New and Retreatment Cases of Tuberculosis**: This report complies with the epidemiological and administrative requirement for the notification of new and relapse cases diagnosed.

a) The report includes the total number of pulmonary smear positive cases (divided into new and relapses), pulmonary smear negative and extra pulmonary cases, which were diagnosed and registered during the quarter. Failures, chronic and return after interruption cases are not included in this report since they are not notifiable cases.
b) The new pulmonary smear positive cases are classified by age & sex whereas all other types of patients are classified only by sex.

B. Quarterly Report of Sputum Conversion of New cases, Relapses and Failures : In order to anticipate the outcome of treatment (which would otherwise not available for another 12-15 months) it is essential to monitor the sputum smear conversion rates achieved at the end of 2 or 3 months of treatment. The RNTCP districts with high conversion rates of >85% become eligible for selection as 'sites' for field visit for trainees from implementing districts.

C. Quarterly Report on the Results of Treatment of Tuberculosis patients registered 12-15 months earlier : Cohort analysis is the key management tool for evaluation of the effectiveness of TB control activities in any given area. A cohort consists of patients who were diagnosed, registered and planned to have the same treatment with in a defined period.

Evaluation of outcome of treatment is based on the analysis of two groups of patients
1) New smear +ve pulmonary cases
2) Retreatment smear +ve cases

D. Quarterly report on programme management and logistics : This report facilitates the monitoring of the logistics of drug supply and other material inputs at the peripheral and higher levels. The report also provides a consolidated picture of the case detection and treatment activities under RNTCP for that level.

6.2 Analysis and Feed Back

A. National TB programme : Under the NTP, the Peripheral Health Institutions (PHI) as well as Microscopy / X-ray Centres (MCs / XCs) are required to send monthly reports to the District TB Centre (DTC). The DTC consolidates the monthly reports and transmit the same to the Director of Health Services (DHS) in the state. However, the most significant is the quarterly report, which every DTC has to submit to the Directorate General of Health Services, New Delhi; NTI, Bangalore as well as to the respective state DHS. The NTI analyses the quarterly reports for various indicators of performance described earlier. The reports are also subjected to detailed scrutiny for consistency and reliability. The details of analysis are brought out in a report form and are submitted to the national health authorities. Feedbacks on the state level performance along with a comparison of performance of individual districts are forwarded to the State TB Officer (STO) / DHS. Inconsistencies observed in the quarterly reports as well as the performance are also conveyed to the individual DTOs for bringing in improvements in the implementation as well as reporting of the programme.

B. Revised national TB control programme: Central TB Division, Dte.GHS, GOI, is directly monitoring the performance of RNTCP. A TU for every five lakhs population and MC for every one lakh population are additional institutionalities provided in RNTCP. The records at TU level are periodically updated by the Senior Treatment Supervisor and hence the flow of information from the peripheral level to the TUs has been integrated as a part of the regular administrative/ supervisory mechanism. There is a monthly flow of information on programme management and logistics from the PHIs to the TUs. For this purpose microscopy centres are also treated as PHIs. The information essential pertains to the consumption of drugs, laboratory consumables and other supplies, staff position and training, microscopy activities, etc. These reports are consolidated once in a quarter at TU level for all the PHIs and at DTC level for all the TUs. The information contained in the TB register and TB laboratory registers are used for compiling quarterly reports at TU level for patient oriented activities. The quarterly reports from DTC are furnished to the State TB Officer, Central TB Division, Dte.GHS as well as to NTI. The STO consolidates the quarterly reports received from the DTCs at his level and adds information on the activities at the state level before the same are reported to the Central TB Division, Dte.GHS, New Delhi. The reports received in the Central TB Division are scrutinized thoroughly for consistency of the reported figures. Feedback on the initial scrutiny is conveyed immediately to the concerned DTOs and clarifications are sought. The reports are analysed for indicators of performance. These are later consolidated for knowing the position at state as well as national levels.

7. Monitoring and Supervision

7.1 Monitoring and supervision are inbuilt in the recording and reporting system especially in RNTCP. The record keeping has been so
designed, that a supervisor at any level can check and verify the status of a particular patient at any point of time. Intensive supervision is the backbone of the revised DOTS strategy. The programme provides an efficient default retrieval system, thereby reducing the chances of the case to be transformed into a Multi-drug Resistant (MDR) one. Frequent review meetings conducted by the officers at district, state and national levels also provide the forum for introspection and for corrective and remedial actions.

8. Performance of TB control programme in India & Karnataka

8.1 India has 35 states/union territories and nearly 600 districts with a population of 1.027 millions in 2001. By the end of December 2001, 44% of total population has been covered under RNTCP. The states of Rajasthan, Kerala, Delhi, Himachal Pradesh, Tamilnadu, Manipur, Sikkim and UT of Chandigarh have achieved 100% RNTCP implementation by March 2002. 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 262 RNTCP districts in all as of September 2002.

Fig 1: Population Coverage

![](image1)

CC : Conventional Chemotherapy, SCC: Short Course Chemotherapy

8.2 Karnataka with 27 revenue districts has a population of 527 lakhs as per the 2001 census. There are 28 DTCs in the state. As on 3rd quarter 2002, 11 districts have been brought under RNTCP implementation and the remaining 17 districts are implementing NTP. The districts of Bellary, Bijapur, Chitradurga, Mandya, Raichur, Davangare, Bagalkot, Koppal, Bangalore (Urban), Bangalore (Rural) and Bangalore Mahanagara Palike (BMP) have been covered under RNTCP. This account for a population of 218 lakhs and is about 41% of the population (Fig. 1).

Table 1: Performance of TB Control Programme during the year 2001

<table>
<thead>
<tr>
<th></th>
<th>Population Covered in lakhs by 31.12.2001</th>
<th>Total case treated</th>
<th>Annual total case detection rate</th>
<th>New S-ve* cases</th>
<th>Annual S+ve* detection rate</th>
<th>Ratio of S+ve* to S-ve* patients</th>
<th>2/3 months conversion rate of new S+ve* patients</th>
<th>Success rate of new S+ve* patients</th>
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<tbody>
<tr>
<td><strong>All India</strong></td>
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<tr>
<td>NTP&lt;sup&gt;11&lt;/sup&gt;</td>
<td>5770</td>
<td>666853</td>
<td>129</td>
<td>199550</td>
<td>38</td>
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<td>74%</td>
<td>62%</td>
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<tr>
<td>RNTCP&lt;sup&gt;10&lt;/sup&gt;</td>
<td>4503</td>
<td>471658</td>
<td>121</td>
<td>185178</td>
<td>47</td>
<td>1.25</td>
<td>88%</td>
<td>84%</td>
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<tr>
<td><strong>Karnataka</strong></td>
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<tr>
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<td>65%</td>
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<tr>
<td>RNTCP&lt;sup&gt;10&lt;/sup&gt;</td>
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<td>113</td>
<td>9646</td>
<td>52</td>
<td>0.7</td>
<td>86%</td>
<td>84%</td>
</tr>
</tbody>
</table>

* S-ve* = Smear negative,  S+ve* = Smear positive
8.3 Some of the salient performance indicators for the districts under NTP and RNTCP for the year 2001 are given in the Table-I. All India estimates have also been given for comparison. The annualized new smear positive case detection rate in Karnataka for the year was higher than the national rates for both NTP and RNTCP. The ratios of number of smear positive to smear negative patients were also more favourable in Karnataka for both the programmes compared to all India. However the annualized total case detection rate for RNTCP in the state is fairly lower (113) than the national rate (121)\(^\text{10}\).

8.4 A high conversion rate is usually followed by high cure rate. This gives an indication about the efficacy of the treatment regimen and the degree of supervision during the intensive phase of the treatment. Table 1 shows that smear positive patients converted to smear negative at the end of 3 months were 74\% \& 88\% in All India NTP & RNTCP areas. In Karnataka, however these rates were 66\% and 86 \% in NTP & RNTCP areas respectively.

Monitoring problems and suggestions:

8.5 For the effective functioning of a monitoring system, it is very essential that the basic records and documents are maintained as per the standards specified. Timely consolidation of figures at different levels should be ensured for smooth flow of information to the higher level. The acid test for judging the efficiency of a monitoring system is whether the reports prescribed are received from all the districts in time and are consistent and reliable.

8.6 Smear conversion rate \& Treatment Success rate in Karnataka under NTP was very low as compared to the rates in RNTCP areas (Table I). The reporting of treatment outcome from NTP areas is quite unsatisfactory. NTI had advised the NTP districts to discontinue compilation of quarterly reports in DTP/S formats and instead, furnish the reports in the revised Short Course Chemotherapy (SCC)/Conventional Chemotherapy (CC) formats. This was to facilitate the uninterrupted flow of information on treatment outcomes.

8.7 All the 11 RNTCP districts of Karnataka have been regularly submitting quarterly reports in the prescribed format in time. The Central TB Division, Dte.GHS, has brought out the results of the analysis for the year 2001. Scrutiny of the reports has brought out certain shortcomings. It was observed that some of the district reports were inconsistent while reporting new cases. Differences have been observed in the number of patients registered and the number of patients put on treatment. Another area of discordance was in the consumption of sputum containers and laboratory consumables. Re-training of field staff maintaining the basic records and intense supervision could only salvage the situation and render the reporting more accurate and reliable.

8.8 Computers have come in a big way in all walks of life. Computers have been provided to all the DTCs covered under RNTCP. Even TUs could also be equipped with computers in the near future. It is, therefore, suggested that the compilation and transmission of data at district level be immediately commenced in electronic media, if not done already. This not only reduces the processing time at state and national levels, but also reduces the transcription errors at these levels.

Reference:

1. Implementing the Revised Recording and Reporting System (Module 7): Central TB division, Directorate General of Health Services, Min. of Health and Family Welfare, Nirman Bhavan, New Delhi-1 10 011. Annexure IV.


