

Programmes for the control of leprosy, tuberculosis and malaria

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The objective of this paper is to give a brief overview of the major National Health Programmes (NHPs) that are under implementation throughout the country. Under the NHPs for the control of vector-borne diseases (VBDs), tuberculosis (TB) and leprosy, the Government of India (GOI) provides financial and commodity assistance to State Governments. As these diseases/conditions disproportionately affect the poor and entail wide externalities, the Government has from time to time set targets to eliminate or control them. Thus, while malaria and TB were to be contained, leprosy was to have been eliminated. Yet due to various systemic problems, achievement of these goals continues to elude us. Besides, India is committed to the global community as a signatory of the Agreement to achieve the Millennium Development Goals by 2015 which specifically lay down reductions in the incidence of TB, malaria and HIV/AIDS.

For the reasons stated above, the NCMH accorded a high priority to the achievement of these targets and goals. With this in mind, the NCMH sought to obtain a baseline of the prevalence of these diseases/conditions and identify the casual factors—direct/indirect and, based on a minimum standard of treatment, assess the cost implications of achieving the goals. A detailed review brought out three important points:

1. That on account of inadequate time-series data and sound, validated data, arriving at a baseline estimation of disease prevalence was not possible for vector-borne diseases and leprosy;
2. Identification/prioritization of interventions based on cost-effectiveness and related evidence was not possible for want of any operational research undertaken on a significant scale that could be extrapolated for addressing the diversity and disparities that characterize this country; and
3. Given the huge commitment of resources to these programmes, highest priority should be accorded to undertaking operational research and community-based

epidemiological studies to arrive at baseline estimations and evidence on the effectiveness of the various interventions being implemented, so as to redesign programmes to suit community preferences if called for, rather than a one-size-fits-all approach.

Accordingly, this paper contains a broad overview of the NHPs related to malaria, TB and leprosy. This is followed by treatment protocols for vector-borne diseases and also estimations of the prevalence levels of TB undertaken by TRC, Chennai for the NCMH. Standard treatment protocols for malaria, TB and leprosy have already been adopted by the Government for treating patients suffering from these diseases. Based on these estimations and standard treatment protocols (STPs), the budgetary deficits and fund requirement have been worked out in the main Commission Report.

Leprosy

Leprosy has been known through the ages, primarily because of the deformity it causes. Leprosy is closely linked with poverty—poverty is both a cause and a result of leprosy, and leprosy patients are forced to impose significant economic and social burdens on their families (Neira 2001; Gokhale 2001). Eliminating leprosy, therefore, has wider implications than merely resolving a public health problem. It will have a dramatic impact on the overall economic empowerment of the people affected by it (Neira 2001). Twenty-five per cent or more of leprosy patients have some degree of disability (WHO 1960; Reddy and Bansal 1984; Saha and Das 1993; Kalla *et al.* 2000). Prevention or correction of deformity in patients with leprosy would increase the probability of gainful employment, increase annual earnings per patient and raise overall earnings for all patients (Max and Shepherd 1989).

In view of the substantial progress achieved with multi-drug therapy (MDT), in May 1991, the World Health Assembly adopted resolution WHA44.9 on the elimination of leprosy to reach the global target prevalence of less than 1 case per 10,000 population by 2000. To date, out of 122 countries where leprosy was considered a public health

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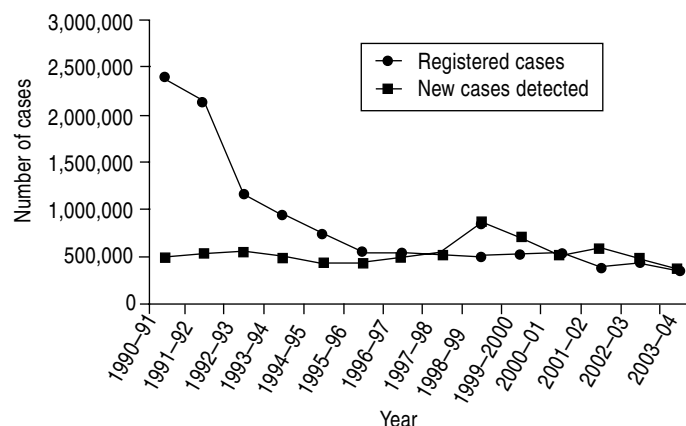


Fig. 1 Number of leprosy cases from 1990–91 to 2003–04

problem, only 10 still have to reach the elimination goal—Angola, Brazil, Central African Republic, Congo, India, Liberia, Madagascar, Mozambique, Nepal and Tanzania. Most countries of the world have eliminated leprosy primarily because of MDT which came into wide use in 1982. Because of MDT, many countries that had a very high prevalence of leprosy could manage to eliminate it as a public health problem within a short span of time. Thailand reduced the prevalence of leprosy from more than 50/10,000 population in 1953 to less than 1/10,000 population by 1995 by dismantling the vertical programme and integrating leprosy control activities into the provincial primary health care services (WHO 2001). Sri Lanka eliminated leprosy by 1995 by using the mass media to change the attitude of the masses and increase case detection. Even though many countries could eliminate leprosy, as on 31 March 2004, India had a prevalence of 2.44 cases per 10,000 population and 265,781 leprosy cases on record, having detected 367,143 new cases during 2003–04 (Fig. 1).

Leprosy control in India

The Government started the National Leprosy Control Programme (NLCP) in 1955 based on domiciliary treatment with dapsone through vertical units implementing survey, education and treatment activities. Following the advent of MDT in 1982, the National Leprosy Eradication Programme (NLEP) was launched in 1983 with the objective of arresting the disease in all known cases of leprosy. However, coverage with MDT remained low due to a range of organizational issues, and fear of the disease and associated stigma. The first World Bank-financed NLEP Project was implemented in India from 1993 to September 2000 wherein the Project supported the vertical programme structure for high-endemic districts, while Mobile Leprosy Treatment Units (MLTUs) were established in moderate- and low-endemic districts. During the Project period, MDT coverage of registered leprosy cases increased to 99.5% (from 62% in 1992), due to which the prevalence rate reduced from over 24/10,000 population in 1991 to 3.7/10,000 by March 2001.

The second phase of the World Bank-financed NLEP

(2001–02 to 2003–04) was significant for two reasons: (i) an attempt was made to decentralize the Programme and integrate it with the general health care system so as to develop the required capacity at decentralized levels of implementation for sustaining Programme gains, and (ii) it adopted a more focused approach of intensive campaigns in select areas—Leprosy Elimination Campaign (LEC) Projects in urban areas, Special Action Projects for Elimination of Leprosy (SAPELs) in rural areas, and Modified Leprosy Elimination Campaigns (MLECs) for conducting intensive awareness/detection campaigns. For the first four years, MLECs were conducted throughout the country, but in 2003–04, they were restricted to the eight identified high-endemic States of Bihar, Jharkhand, Chhattisgarh, Orissa, Andhra Pradesh, Uttar Pradesh, Maharashtra and West Bengal. One additional activity undertaken was holding prevention of deformity (POD) camps and providing on-the-job POD training to the general health care staff, and offering self-care learning practices to patients with disabilities and ulcers.

Against the targets of detecting 11 lakh new leprosy cases and curing 11.5 lakh new cases with MDT in the second phase of the Project, 14.36 lakh new cases (130.5%) were detected and 15.54 lakh cases (135.1%) discharged from treatment as cured of leprosy. The prevalence rate of leprosy decreased from 3.74 cases per 10,000 population in 2000–01 to 2.44 cases per 10,000 by March 2004, and the disability rate decreased to 1.44%. As on 1 April 2004, 17 States still had a prevalence rate of more than 1/10,000, 71 districts (12.03%) still have a prevalence rate of more than 5/10,000 population, and the goal of leprosy elimination has not been achieved. Of the 3.67 lakh new leprosy cases detected in 2003–04, 1.44 lakh (39.3%) were multi-bacillary (MB) cases (an increase from 33.9% in 2000–2001) and over 50,000 (13.8%) were children, thereby indicating that leprosy was being diagnosed at an advanced stage. Thus, there was continuing transmission of the causative organism (*Mycobacterium leprae*) in the environment. This continued transmission is a major hindrance to leprosy control (WHO 1997) and increases the risk of transmission of infection (Beers *et al.* 1999). One reason for the increase in the proportion of MB cases of leprosy from 33.9% to 39.3% is the change in definition of MB cases by the Central Leprosy Division—from the earlier 10 or more to 6 or more skin patches.

The National Health Policy, 2002 now targets the elimination of leprosy by 2005. To achieve this goal, intensive efforts are required in 12 States (Uttar Pradesh, Andhra Pradesh, Bihar, Maharashtra, West Bengal, Orissa, Jharkhand, Tamil Nadu, Chhattisgarh, Gujarat, Karnataka and Madhya Pradesh [MP]), which account for about 93.9% of new cases (Fig. 2).

Funding of the NLEP

The World Bank was the major source of funding for the

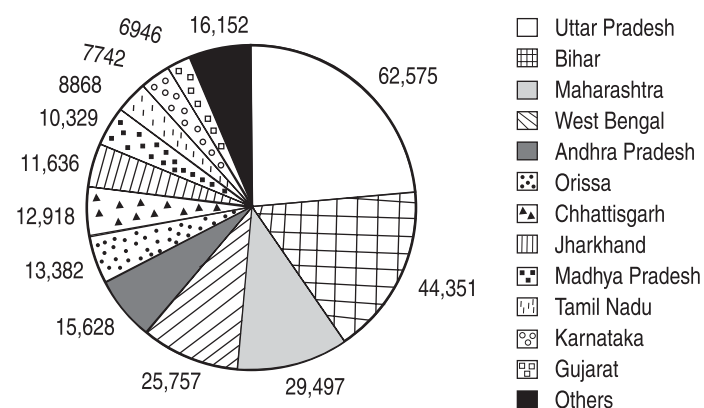


Fig. 2 Leprosy cases in 2003-04

NLEP since 1993 but has stopped financing the project since December 2004. The total allocation under the Programme in 2002-03 was Rs 73.72 crore. In this year, 30% of the expenditure was incurred on information, education and communication (IEC) activities, almost one-fourth on salaries and 16.5% on drugs for leprosy (Table 1).

Administration costs were Rs 27.93 crore (42.7%) (consisting of contractual staff involved in administration of the Programme at the Centre, State and district levels, office expenses, purchase of vehicles, furniture), Rs 12.19 crore (18.6%) on patient care (consisting of drugs, salaries of field-level contractual staff involved in leprosy control work, some medical equipment, case detection campaigns, medical/surgical services), Rs 23.78 crore (36.4%) on development costs (comprising IEC activities and training) and Rs 1.49 crore (2.3%) on assessment costs (comprising review, monitoring and research).

Leprosy control: The future and recommendations

Till March 2004, the GOI was providing funds for salaries of staff besides other activities. From 1 April 2004, the Central Government is supporting activities such as training, IEC, vehicle repair and maintenance, TA/DA of staff, etc., and drugs are being supplied with WHO support. However, the States have been directed to reduce 75% of the vertical

Table 1. Expenditure under the National Leprosy Eradication Programme, 2002-03 (Rs in lakh)

Expenditure head	Centre	States	Total	%
01. Salaries				
2 Contractual staff	1.51	1480.14	1481.65	22.7
4 Honorarium	0	59.31	59.31	0.9
02. Maintenance			0	0
03. Medical supplies/consumables				
1 Drugs and medicines	0	1077.46	1077.46	16.5
04. Office expenses				
1 Stationery	0	36.23	36.23	0.6
2 POL	0.31	419.66	419.97	6.4
4 Others	0.44	710.42	710.86	10.9
05. Training	2.45	403.48	405.93	6.2
06. IEC	490.51	1481.13	1971.64	30.2
07. Review and monitoring	16.84	114.66	131.5	2.0
08. Research and studies	10.36	6.7	17.06	0.3
09. Any other				
1 Case detection campaigns	0	99.4	99.4	1.5
2 Medical/surgical services	0	41.85	41.85	0.6
Total	522.41	5930.44	6452.85	98.7
10. Civil works				
1 New construction	0	0	0	0
2 Furniture	0	30.47	30.47	0.5
11. Equipment				
1 Medical equipment	0	22.23	22.23	0.3
2 Surgical equipment	0	0	0	0
12. Vehicle	0	32.08	32.08	0.5
Total	0	84.78	84.78	1.3
Grand total	522.41	6015.22	6537.63	100.0
%	8.0	92.0	100.0	

IEC: information, education and communication; POL: petroleum, oil and lubricants

leprosy staff and utilize them appropriately within the general health care system. The remaining 25% of regular vertical NLEP staff will be retained under the Programme to form State and district NLEP cells/nuclei in leprosy-endemic pockets. The salaries of leprosy officers are now being paid by the States. Some staff have been retained where the prevalence rate is over 1/10,000 while in areas where it is less than 1/10,000, one person has been retained to advise on and provide training for leprosy-related activities. All general health care staff have been imparted 3 days' training in the diagnosis and management of leprosy and related IEC activities in the community.

The process of integration (both structural and functional) for leprosy control activities in the general health care delivery system needs to be accelerated. This could be a more cost-effective and viable strategy that will also help ensure sustainability of the programme based on domestic funding and reduce the dependence on foreign financing/assistance. The vacant posts of multipurpose workers (male) (MPWs) (M) in most States need to be filled as the overburdened auxiliary nurse–midwife (ANM) alone might not be able to devote enough time towards leprosy control activities in her area.

The fair progress in the control of leprosy at the national level could be deceptive, as areas still remain where the prevalence of leprosy is unacceptably high. There is no time for complacency and focused attention needs to be given, especially to the 11 States that contribute to over 90% of leprosy cases and the 71 districts with a prevalence of over 5/10,000 if we are to achieve the target of leprosy elimination.

Special action needs to be taken for difficult-to-access communities, urban areas and migratory groups as the risk of drop-out and discontinuation of treatment is high in such groups. Although it is now known that leprosy is a curable disease through MDT, there is still a stigma associated with the disease. Messages that should have been imbibed by the community have not reached the masses, especially in rural and disadvantaged urban areas. Innovative approaches, like extensive use of the mass media to change the attitudes of the masses, need to be implemented to improve community awareness and participation so that suspected cases do not fear stigma and report to a health facility at the earliest for timely diagnosis and prompt treatment.

With a decline in the number of cases, priority attention also needs to be given to activities for prevention of deformities, and the Government should continue additional budgetary provisions for this purpose. Elimination of deformity in leprosy cases would also raise productivity enormously in the country.

Tuberculosis

Though the National Tuberculosis Control Programme was launched in 1962, India accounts for nearly one-third

of the global burden of TB. About 10 lakh are new smear-positive highly infectious cases and about 5 lakh deaths occur due to tuberculosis (Government of India 2003a). This continued burden of disease is particularly tragic because TB is nearly 100% curable. Besides, control of TB with multidrug regimens has been cited as one of the five highly cost-effective interventions (World Bank 1993). Drug resistance in sputum-positive patients treated with short-course chemotherapy has been shown to be low (2.1%) (TRC, ICMR 2001). Untreated patients can infect 10–15 persons each year; poorly treated patients develop drug-resistant and potentially incurable TB.

TB imposes an enormous social and economic burden on the people; it affects all age groups but has its greatest impact on productive adults. With TB, there is loss of productivity and increase in debts. The total direct cost of treatment of TB is higher for women than for men. The fear and stigma associated with TB have a greater impact on women than on men.

One single TB case in a family leads to the loss of 2–3 months of income.

Low-income people are at higher risk of getting TB as it spreads in crowded places—households, school, workplace, marketplace and commutes between them (Health and Development Initiative 2004a). TB kills more women in India than any other infectious disease and causes more deaths among women than all causes of maternal mortality combined. Moreover, women with TB are stigmatized—more than 100,000 women are rejected by their families each year because of TB. The disease also has an adverse impact on children—it leads to a large number of children becoming orphans, and every year in India alone, 300,000 children leave school on account of their parents' TB (Government of India 2004b). Because more than three-quarters of people with active TB are in the economically productive age group (15–54 years), the economic and social costs to them and the society are huge (Health and Development Initiative 2004b). On an average, 3–4 months of work time are lost if an adult has TB, resulting in the loss of 20%–30% of annual household income. An average of 15 years of income is lost if an individual dies of the disease (Government of India 2004b). Every year, TB costs India more than Rs 13,000 crore. In addition, every year, TB patients spend more than Rs 645 crore in seeking private care for TB. It has been estimated that if the GOI spent even US\$ 200 million (Rs 900 crore) per year on effective implementation of Directly Observed Treatment, Short-course (DOTS), the tangible benefits to the Indian economy would be worth at least US\$ 750 million per year (Rs 3375 crore) (WHO 2004).

The World Health Assembly approved two targets in 1991: to cure 85% of newly detected cases of sputum smear-positive TB, and to detect 70% of existing cases of sputum

smear-positive TB. The case-finding target was set at 70% as being the highest level that could reasonably be attained in average developing-country settings (Newell 2002). The WHO emphasizes the need to attain the cure target first, as high numbers of failed treatments can actually lead to an increase in the incidence of TB due to the creation of chronic transmitters. Only when the first target has been met should case finding be increased until the second target is met.

Proxy for the tuberculosis situation: Annual rate of tuberculosis infection

The 1955–58 survey conducted by the Indian Council of Medical Research demonstrated a high prevalence of TB in India at 400/100,000. Annual rate of tuberculosis infection (ARTI) studies, conducted in 2000–03, showed an ARTI of 1.5% at the national level (1.9% in the North Zone, 1.6% in the West Zone, 1.3% in the East Zone and 1.0% in the South Zone), only a marginal decline from the 1.7% reported in earlier studies (Narain *et al.* 1963; Mayurnath *et al.* 1991). There are striking rural–urban differences in ARTI—2.1% in urban areas and 1.2% in rural areas.

Tuberculosis control in India

A 1992 joint review of TB control activities indicated that despite the existence of a national programme, TB patients were not being accurately diagnosed, and most patients did not complete treatment. This review led to the Revised National Tuberculosis Control Programme (RNTCP) being started on a pilot basis in 1993, followed by large-scale implementation in 1997. By December 2004, 545 districts with a population of 94.2 crore had been covered and it is expected that the entire country will be covered under the RNTCP by 2005. With increasing coverage of areas under the RNTCP, the number of deaths due to TB have declined from over 5 lakh to about 4 lakh per year—in registered patients, the death rate has declined seven-fold. It has been further estimated that if a case detection rate of 70% and cure rate of 85% can be maintained, there would be a decline of 6%–12% per annum in the incidence of new cases of TB.

For every 1.0% of ARTI, an estimated 50 new cases of smear-positive pulmonary TB are expected for every lakh population, in addition to sputum-negative pulmonary TB and extrapulmonary TB cases. Thus, there are an estimated 7.95 lakh new cases of smear-positive pulmonary TB in the country (in addition to smear-negative pulmonary TB and extrapulmonary TB cases), and only about 3.59 lakh new sputum-positive cases (45.1%) were put on DOTS treatment in 2003.

Laboratory diagnosis of tuberculosis

Sputum microscopy is the mainstay of the laboratory

diagnosis of TB and based on the results of three sputum examinations, patients are categorized as sputum positive or sputum negative and put under treatment as Category I, Category II or Category III patients. Microscopy Centres (MCs) have been established for a population of 100,000, which roughly corresponds to the population of a CHC or Block PHC. For non-RNTCP areas, MCs were set up for every 200,000 population, but now that the major parts of the country have been covered under the RNTCP, it is expected that MCs are being set up for 100,000 population. Patients often have problems in giving three sputum samples at the designated centres, particularly if they live far away from these centres, but it has been observed that strict supervision is required for quality control of sputum examination. The analysis of an External Quality Assurance Scheme in Mumbai showed a false positivity rate of 0.31% between the Senior Tuberculosis Laboratory Supervisor (STLS) and the Laboratory Technician (LT), and 13.8% between the Quality Assurance Centre (QAC) and LT. A false negativity rate of 0.61% between the STLS and LT and 2.7% between the QAC and LT was also found. There is thus a need for quality assurance (QA) and retraining of laboratory personnel under the RNTCP to maintain the quality of sputum examination.

Directly Observed Treatment, Short-course (DOTS)

The implementation of DOTS hinges on five interventions:

- Political commitment for sustained TB control
- Sputum smear microscopy to detect infectious cases among those people attending health care facilities with symptoms of pulmonary TB
- Regular, uninterrupted supply of antituberculosis drugs
- Short-course chemotherapy for all TB cases to be given under direct observation
- Systematic monitoring and accountability for every patient diagnosed (improved monitoring and supervision using the TB Register).

Once a person is diagnosed as having TB by sputum examination, he/she is put on DOTS. A DOTS provider could be any person living in the village or neighbourhood of the patient—a health worker, a teacher, a *sarpanch*, any other local leader, an *anganwadi* worker (AWW), a shop-keeper—who is willing to supervise the administration of drugs to the patient. In Gurgaon, it was observed that about 60% of DOTS providers were community volunteers. In the majority of cases, the DOTS provider is the AWW.

In many instances, TB drugs are not administered under the direct supervision of AWWs; in some cases they give the drugs to the patient on a weekly basis to be taken by himself/herself. Occasionally, they give all the drugs to the patient for the total duration all at once. At some places, the posts of Senior Treatment Supervisor (STS) and STLS are vacant and supervision is lacking. Occasionally, the AWWs, who were the DOTS providers, came across situa-

tions when the patient developed some side-effects due to the antituberculosis drugs, and had to take the patient to the nearest PHC. She does not get anything for taking the patient to the PHC, not even money for transport in such a case. In Bangalore, an NGO had even identified household members as DOTS providers, which was contrary to the guidelines issued under the Programme.

To encourage community involvement in effective implementation of the Programme, provision has been made for an honorarium of Rs 175 to the DOTS provider. However, this scheme was stopped in Orissa on the plea that since many government service providers were also involved in the administration of drugs under DOTS, they might feel demotivated as this honorarium was paid only to non-government DOTS service providers.

DOTS is supposed to be given under supervision but is not strictly supervised in many cases.

Often, the provider gives the drugs to the patient for a week or a month.

In some cases, DOTS providers have been identified from the household itself.

Orissa stopped giving the honorarium of Rs 175 to DOTS providers at the community level.

Thus, although programme strategies are formulated at the level of the Central Government, in effect, deviations from the guidelines are observed when it comes to actual implementation through States or at the local level. Second, as far as supervised treatment is concerned, it has been documented that the need for DOT as a universal requirement is controversial, since there are also other elements that contribute to the success of TB control programmes (Zwarenstein *et al.* 1998; Volmink *et al.* 2000).

A critical activity for the success of DOTS is monitoring and supervision to ensure a new case detection rate of at least 70% and a cure rate of 85%. Besides, monitoring and supervision is also required to ensure that patients who are put on treatment complete the full course. However, the performance under the Programme shows that although as a national average the treatment success rates are over 85%, there are variations between States and some districts have cure rates of less than 40%. At the same time, case detection rates are less than 70% in many States/UTs (barring Andhra Pradesh, Chandigarh, Delhi and Sikkim), and this might be an important cause of India's failure to achieve the target of TB control. This evidence emphasizes the need to strengthen Programme monitoring and supervision of implementation at all levels.

Involvement of private practitioners and NGOs

Many TB cases/chest symptomatics seek treatment from private practitioners (PPs) in the first instance (Newell 2002; Sudha *et al.* 2003; Rangan 1995). Private health care facilities are probably the first and preferred point

of contact for both urban and rural chest symptomatics, the major reasons being proximity to the residence and the perception that good quality care would be available. Treatment for TB through PPs is usually of poor quality with very low cure rates. There is a threat that patients who receive poor treatment neither die nor are cured of the disease, but remain sputum-positive and chronic transmitters of TB (Newell 2002; Kalk 2003). India has one of the largest private health care sectors in the world, with an estimated 80 lakh private practitioners (PPs). Despite the rapid expansion of RNTCP, there is delay in the diagnosis of smear-positive TB. Factors associated with this delay were found to be initial consultation with a private provider and patient's residence more than 2 km from a health facility (Rajeswari *et al.* 2002b). Of late, some efforts have been made to involve PPs and about 3000 PPs are officially providing RNTCP services (Government of India 2004a). Some schemes have been designed for the involvement of PPs in the RNTCP. These include the referral of persons suspected of having TB to a designated microscopy centre (DMC) (scheme 1), DOTS treatment by PP or staff for which drugs are provided (scheme 2), private health facility with its own laboratory working as a DMC under the RNTCP and charging fees (scheme 3A), private health facility with its own laboratory working as a DMC and DOTS provider under the RNTCP for which drugs are provided under the Programme and service fees are charged by the PP (scheme 3B), private health facility with its own laboratory working as DMC and providing free diagnostic services for which laboratory materials are provided under the RNTCP (scheme 4A), and private health facility with its own laboratory working as DMC providing free diagnostic services for which the required laboratory materials are provided, and DOTS provider, for which drugs are provided under the RNTCP (scheme 4B).

About 40%–50% of patients, although ultimately diagnosed and treated in a government health facility, were found to have incurred heavy expenditure while seeking a diagnosis in the private sector. This necessitates the active involvement of private practitioners in the management of TB.

More than 750 NGOs are officially providing RNTCP services because of their accessibility and flexibility of services. Various schemes have been formulated for the involvement of NGOs in the RNTCP which include health education and community outreach (scheme 1), provision of directly observed treatment (scheme 2), in-hospital care for TB disease (scheme 3), microscopy and treatment centre (scheme 4) and TB Unit Model (scheme 5).

Private practitioners and NGOs have been suboptimally involved under the RNTCP keeping in mind their large numbers and widespread availability and acceptability. Enormous efforts have to be made for involving them.

Role of pharmacists in the control of TB

In the majority of cases, retail drug outlets dispense the anti-TB drugs prescribed by PPs. In a recent study, the majority of pharmacists were found to be unaware of the existence of the RNTCP, but almost all of them were willing to learn and contribute to TB control (Rajeshwari *et al.* 2002a). No efforts have been made so far to sensitize private pharmacies/pharmacists about the RNTCP.

Management structure at the Central level

A study of the organizational structure of the Central TB Division in the Ministry of Health and Family Welfare shows that there are only five regular government officers managing the programme (DDG [TB], 3 CMOs and 1 TB Specialist), supported by 12 Consultants (Medical), 3 Consultants (Finance), 3 Consultants (LAN and Computer Networking), 5 Statistical Assistants and 2 Data Entry Operators whose services have been hired on contract. Similarly, services of 80 Medical Consultants have been hired at the State and district levels (supported by WHO) to increase their capacity; with rapid expansion of areas covered under the RNTCP, there are plans to hire the services of 40 more Medical Consultants at the State and district levels with WHO support.

Collaboration with the National AIDS Control Organization (NACO)

Tuberculosis is also an opportunistic infection in patients with HIV infection/AIDS. Due to the RNTCP, the incidence

of new cases of TB is expected to decline, but due to HIV infection, there is likely to be a five- to six-fold increase in TB cases. Therefore, coordination between NACO and the RNTCP is being strengthened at the Central level. Moreover, there are also interactions between drugs used for the treatment of TB and those for HIV infection/AIDS. NACO and the Central TB Division of the GOI have issued joint guidelines for the treatment of TB in cases with HIV infection/AIDS. In the first two phases, coordination was improved in 14 States (in 6 high-prevalence States—Andhra Pradesh, Karnataka, Maharashtra, Manipur, Nagaland, Tamil Nadu, and in Delhi, Gujarat, Himachal Pradesh, Kerala, Orissa, Punjab, Rajasthan and West Bengal). Sensitization workshops have been conducted and staff of NACO and RNTCP have been trained on TB–HIV-related issues.

Analysis of financial expenditures under the RNTCP

The outlay for the RNTCP has increased from Rs 86 crore in 1997–98 to Rs 130.32 crore in 2003–04, the World Bank financing over 75% of the total and the remaining coming from the GOI, and through grants from other agencies (Table 2).

The Central Government procures microscopes, drugs and X-ray rolls and supplies them to the States for further distribution to the districts. In addition, it provides cash assistance for drugs for smear-negative cases and also releases cash to State and District TB Control Societies: 100% assistance is given for new constructions and minor

Table 2. Abstract summary of funding of the TB Control Programme for the years 2001–02, 2002–03 and 2003–04 (Rs in lakh)

Year		Domestic budget	From external agencies							Total
			World Bank	WHO	DANIDA	DFID	GFATM	GDF	USAID	
2001–02	In cash	450	8111.56	339.03	445	1351.5	0	0	0	10,697.09
	In kind	0	0	0	0	0	0	0	0	0
	Grants-in-aid to societies/NGOs	0	0	0	0	0	0	0	0	0
	Total	450 (4.2%)	8111.56 (75.8%)	339.03 (3.2%)	445 (4.2%)	1351.5 (12.6%)	0	0	0	10,697.09
	Grant/loan		Loan	Grant	Grant	Grant	Grant	Grant		
2002–03	In cash	174.45	7198.9	1241.51	749	1574	0	0	0	10,937.86
	In kind	0	0	0	0	0	0	0	0	0
	Grants-in-aid to societies/NGOs	0	0	0	0	0	0	0	0	0
	Total	174.45 (1.6%)	7198.9 (65.7%)	1241.51 (11.4%)	749 (6.8%)	1574 (14.4%)	0	0	0	10,937.86
	Grant/loan		Loan	Grant	Grant	Grant	Grant	Grant		
2003–04 (estimated)	In cash	20	8326.48	1241.51	254.52	610	1550	0	100	12,102.51
	In kind	0	0	0	0	0	0	929	0	929
	Grants-in-aid to societies/NGOs	0	0	0	0	0	0	0	0	0
	Total	20 (0.2%)	8326.48 (63.9%)	1241.51 (9.5%)	254.52 (2.0%)	610 (4.7%)	1550 (11.9%)	929 (7.1%)	100 (0.8%)	13,031.51
	Grant/loan		Loan	Grant	Grant	Grant	Grant	Grant		

repair of buildings (Microscopy Centres, State Drugs Store, Computer Room, State TB Training and Demonstration Centre), purchase and maintenance/hiring of vehicles, laboratory consumables, training, printing/stationery, IEC activities/publicity, purchase of medical and office equipment and their maintenance, and office expenses. It also provides 100% assistance to the States for the salaries of the STS, STLS, LT, Tuberculosis Health Visitors (TBHV), drivers, part-time accountants and medical officers in 15% of District Tuberculosis Societies, the rest being borne by State Governments. The States provide salaries of one State Tuberculosis Officer along with clerks in his section.

Only 13.3% of expenditure in 2001–02 under the Programme was capital expenditure and 86.7% was of a recurring nature, the majority on drugs (52.3%) and only

2.0% on IEC activities (Table 3). In 2002–03, with expansion of coverage under the RNTCP, the Central TB Division spent Rs 440.96 lakh on IEC activities (compared to only Rs 1.07 lakh in 2001–02). Less amount was spent on IEC in 2001–02 because the RNTCP was not implemented throughout the country at that stage and almost all expenditure on IEC was incurred at the State/district level.

Recommendations

The national ARTI of 1.5% shows an insignificant decline since the 1955–58 survey, thereby indicating that efforts made for TB control have not been fruitful. The immediate priority for the Programme is to cover the entire country under the RNTCP by 2005 as it has been estimated that

Table 3. Expenditure under the Revised National Tuberculosis Control Programme, 2001–02 (Rs in lakh)

Expenditure head	Centre	States	Districts	Total	%
<i>Recurring</i>					
01. Salaries					
1 Regular staff	0	0	520.14	520.14	5.2
2 Contractual staff	16.43	141.25	987.09	1,144.77	11.4
4 Honorarium	0	0.26	18.81	19.07	0.2
02. Maintenance					
1 Of medical equipment	0	0	30.74	30.74	0.3
2 Of office equipment	0	4.76	0	4.76	0
3 Of vehicle	0	12.85	120.09	132.94	1.3
4 Civil works	0	0	0	0	0
03. Medical supplies/consumables					
1 Drugs	0	0	5262.64	5,262.64	52.3
2 Laboratory materials	0	19.23	425.76	444.99	4.4
04. Office expenses					
1 Stationery	0.32	15.37	140.62	156.31	1.6
2 Vehicle hiring	16.0	15.72	20.46	52.18	0.5
3 TA	0.65				
4 Miscellaneous	0	32.27	276.02	308.29	3.1
05. Training	17.32	36.39	326.57	380.28	3.8
06. IEC/publicity	1.07	36.08	168.20	205.35	2.0
07. Review and monitoring	18.21	0	0	18.21	0.2
08. Research and studies	0	0	0	0	0
09. NGO support	0	5.47	36.63	42.10	0.4
Total	70.0	319.65	8333.77	8,723.42	86.7
<i>Capital</i>					
10. Civil works					
1 New construction	0	14.45	263.78	278.23	2.8
11. Equipment					
1 Medical equipment	0		256.38	256.38	2.50
2 Office equipment	0	39.09	275.95	315.04	3.1
12. Vehicles purchase	0	103.36	381.63	484.99	4.8
Total	0	156.90	1177.74	1,334.64	13.3
Grand total	70.0	476.55	9511.51	10,058.06	100.0
%	0.7	4.70	94.60	100.00	

TA: travelling allowance; IEC: information, education and communication; NGO: non-governmental organization

for each year of delay in national expansion beyond 2005, the human and economic costs over the next 20 years will be high: 800,000 preventable cases of TB, 280,000 avoidable deaths and direct and indirect costs of Rs 5700 crore (WHO 2000). With rapid expansion of the RNTCP, the GOI will have to arrange for funds for the maintenance of RNTCP activities in already covered areas either from the domestic budget or from additional external funding, once funding from the World Bank ends. In an exercise undertaken by the NCMH for estimating the costs of providing universal access to the cure of TB, it was estimated that Rs 190.78 crore would be required annually for providing treatment to new cases of TB alone, in addition to administration and programme management costs. Against this, only Rs 130.32 crore were allocated for the RNTCP by the Central Government in 2003–04.

With the fastest expansion of RNTCP in the world, it is critical that the quality of monitoring and supervision be improved at all levels—the Centre, State and district—as the treatment costs of MDR TB will be more than ten times the treatment of a case under the RNTCP. This requires intensive efforts to improve and strengthen the monitoring and supervision capacity at all levels. The RNTCP is being implemented by a few officers from the regular services supported by services of consultants who have been hired on contract and who could be withdrawn any time. While this is beneficial in the short run, in the long run this seriously compromises the quality of management of programmes at all levels, as adequate attention is not given for maintaining the continuity of support to programme managers. To compound the problems, the frequent change of State Tuberculosis Officers (STOs) in many States critically affects the continuity of the Programme. Thus, top priority needs to be accorded to programme management structures and capacity at all levels—the Centre, State and district—instead of simply relying upon the support of consultants.

It has been observed that the DOTS strategy is not universally used for the treatment of TB even in districts that have been covered under DOTS. There are reports that the All India Institute of Medical Sciences (AIIMS), New Delhi and many medical colleges do not use this strategy. There is an urgent need to develop a network and a working relationship between medical colleges and RNTCP implementation. While making all-out efforts to improve monitoring and supervision, intensive efforts are required for maintaining high cure rates among new smear-positive cases. With the rapid expansion of the RNTCP to cover the remaining areas, there is also a need to detect more and more new smear-positive cases of TB so that case detection rates are increased from about 48% to over 70%. This would require intensive IEC efforts to make people aware of the Programme, of the free treatment available and of the success of the treatment.

In Singapore, under the Singapore Tuberculosis Elimination Programme, in addition to DOT, all identified close contacts

(including household contacts and contacts in workplaces) receive a tuberculin skin test; chest X-ray is done for those who react positively or who are symptomatic. Thus, active case finding is conducted and infected contacts who would benefit from preventive therapy are identified. In this way, approximately four contacts per infectious case were identified and an average of one contact per index case received preventive therapy (Chee and James 2003). This kind of screening of close contacts would result in a reduction of the burden of TB disease and might be considered under the RNTCP.

Considering the fact that the private sector is growing fast and the majority of chest symptomatics initially consult PPs, there is an urgent need to integrate PPs in TB control programmes to move from individual cure to public health without minimizing the benefit of individual cure (Kalk 2003; Sudha *et al.* 2003). Involvement of just about 3000 PPs in the country is not enough, considering its vast size and the magnitude of the disease burden. So far, no effort has been made to involve pharmacists/private pharmacies. Better compliance and treatment completion rates, and reduced dropout rates would result if pharmacists are made aware of the drug regimens available under the RNTCP. Therefore, along with the involvement of PPs, orientation of private pharmacists about the tuberculosis control programme would be an important step towards complete treatment of TB leading to a reduction in drug-resistant cases.

Numerous NGOs are working at the grassroots level and have the competitive advantage of further reach in remote areas and considerable flexibility of approach. They could be optimally utilized for creating awareness among the masses about TB and its treatment, diagnosing smear-positive cases of TB and providing treatment under supervision. Many schemes have been designed under the RNTCP for involvement of NGOs but so far only about 750 NGOs have been actively involved in the implementation of the RNTCP. These schemes need to be popularized and NGOs have to be involved in a big way if a programme of this magnitude is to succeed.

MPWs (M) should be involved in supervising the administration of DOTS so that the ANM can attend to other duties. Second, since MDT is also administered under the NLEP with good compliance and because there is wide variation in the manner in which drugs are being administered under DOTS, it is possible to reduce supervision to once a week, if not less, especially for Category I and Category III cases where no injection is to be administered.

It is crucial that the cure rates among new sputum-positive cases be maintained above 85%. While at the national level the cure rate is 86%, there are districts with cure rates of less than 80% (as low as 40% in the Nuapada district of Orissa). While making all-out efforts to improve monitoring and supervision, intensive efforts are required in such areas for maintaining high cure rates among new smear-positive cases.

At present, the focus of DOTS is on diagnosing TB in

symptomatic patients who come to the health facilities. Once diagnosed, the patient is put under treatment (DOTS) for which he/she has to come to the health facility or go to another identified DOTS provider for taking the drugs. The involvement of the community has to be increased to supervise the administration of drugs under DOTS, as this has been shown in other countries (including Bangladesh and Africa) to be a more cost-effective strategy than health facility-based treatment. Increasing the involvement of the community in supervising the administration of drugs under DOTS will also have the additional advantage of reducing the stigma associated with TB, improve treatment compliance and completion rates, and result in better health outcomes especially for vulnerable groups such as women, children and the poor.

Vector-borne diseases: Malaria

Malaria situation in India

Malaria, which accounted for about 7.5 crore cases and 8 lakh deaths every year before the launch of the National Malaria Control Programme (NMCP) in 1953, saw a dramatic reduction to one lakh cases and no deaths in 1965 but was followed by a resurgence in 1976 due to resistance of the *Plasmodium* species to drugs and of mosquitoes to insecticides. A modified Plan of Operations launched in 1977 stabilized the incidence of malaria to around 20 lakh cases in the 1980s. During 1994, some epidemics due to malaria were observed in some States. A new control strategy called the Malaria Action Programme was started in 1995.

The reported incidence of malaria during the past decade was between 20 and 30 lakh cases per year, with about 1000 reported deaths annually; this has shown no decline. The number of *Plasmodium falciparum* cases has also remained around 10 lakh per year. Many States had an Annual Parasite Index (API) of over 2/1000 in 2002; these include Arunachal Pradesh, Assam, Chhattisgarh, Goa, Jharkhand, Karnataka, Meghalaya, Mizoram, Orissa, Tripura, West Bengal, and Dadra and Nagar Haveli. The number of malaria cases (total and *Plasmodium falciparum* cases) in the past ten years is shown in Tables 4 and 5 respectively and is depicted in Figure 3.

There is a consensus that malaria as a disease is grossly underreported, largely because information on the number of cases of malaria that is available from the National Vector-borne Disease Control Programme (NVBDCP) is based only on reported cases treated in the public sector, and a large proportion of cases of malaria treated in the private sector go unreported.

National Vector-borne Diseases Control Programme and Enhanced Malaria Control Project

The failure to cap the resurgence of malaria and the stagnant/increased incidence of other VBDs such as kala-

azar, dengue, filariasis and Japanese encephalitis resulted in the integration of all these diseases under the NVBDCP with a budgetary outlay of Rs 1370 crore during the Tenth Plan. Of all these, malaria is the most virulent in terms of the number of lives it claims every year, particularly of the poor. The Enhanced Malaria Control Project (EMCP), financed by the World Bank, is being implemented since September 1997 in 1045 PHCs of 100 districts in 8 States and 19 urban areas. At the time of starting the Project, EMCP areas constituted around 7% of the country's population and contributed approximately 40% to the malaria burden. The main components strengthened under the Project are:

- Early detection and prompt treatment: Drug distribution centres (DDCs) and fever treatment depots (FTDs) are now functioning in the vast majority of villages in EMCP areas. Rapid diagnostic test kits have been supplied to EMCP districts for use in remote areas where access to microscopy is limited.
- Selective vector control: Reliance on indoor residual spraying (IRS) has declined by 30% in EMCP areas. This has been achieved by reducing the overall disease burden through expansion of early diagnosis and prompt treatment facilities, use of insecticide-treated bednets and use of larvivorous fish.
- Insecticide-treated bednets: These have been introduced in a big way in the project areas, and their popularity has increased because of partnerships with NGOs for community distribution and re-treatment, and intensive IEC campaigns for increasing the use of these bednets.
- Institutional strengthening: State- and district-level societies have been made functional; 3453 training courses have been organized, and IEC and social mobilization efforts have been intensified.

Central assistance for control of malaria and other vector-borne diseases

For the control of malaria, the Central Government provides assistance to States on the following pattern:

1. 100% central plan assistance for the north-eastern States, which includes material and equipment as well as cash assistance towards operational costs.
2. 100% assistance of material (insecticides, drugs, vehicles, bednets, equipment, diagnostic kits, etc.) and cash assistance through State and District Malaria Control Societies under the EMCP.
3. 50%:50% cost-sharing between the Centre and States as per policy. In the remaining malaria-prone areas the GOI provides material assistance in the form of insecticides (DDT, malathion, larvicides, drugs). The State Governments bear all other expenses of programme implementation.
4. Funds are also allocated to offices of the Regional

Table 4. State-wise distribution of the number of malaria cases from 1994 to 2003

State/UT	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Andhra Pradesh	90,301	98,013	127,814	129,577	118,800	129,020	80,557	57,735	38,053	35,995
Arunachal Pradesh	49,703	51,115	48,667	53,196	49,554	58,243	46,165	56,030	46,431	34,810
Assam	161,038	230,702	176,622	123,650	94,645	131,048	84,915	95,142	89,601	76,570
Bihar	71,900	86,722	104,680	74,676	114,958	131,898	9,509	4,108	3,683	2,652
Chhattisgarh							359,155	290,666	235,434	194,419
Goa	3456	3,886	11,632	21,025	25,975	15,380	9,164	12,331	16,818	11,370
Gujarat	242,456	191,028	143,817	159,652	106,825	64,130	36,712	81,347	82,966	130,744
Haryana	29,810	59,621	128,232	69,710	12,115	2,604	1,050	1,202	936	4,374
Himachal Pradesh	3,091	6,695	8,349	5,320	1,433	700	491	349	176	133
Jammu and Kashmir	2,760	9,005	14,289	9,412	5,451	3,574	3,045	912	455	309
Jharkhand							133,453	130,784	126,589	112,740
Karnataka	266,459	285,830	219,198	181,450	118,712	97,274	109,118	197,625	132,584	100,220
Kerala	9,075	11,878	11,653	8,265	7,439	5,141	2,940	2,289	3,360	2,380
Madhya Pradesh	323,628	483,563	500,574	451,552	475,098	527,510	194,689	183,118	108,818	99,708
Maharashtra	330,699	368,796	317,416	204,969	165,985	137,712	81,406	56,043	45,568	62,947
Manipur	7,845	4,652	2,151	1,742	1,306	2,662	1,064	943	1,268	2,589
Meghalaya	11,953	24,920	26,968	22,237	17,618	14,798	13,699	20,630	17,918	18,366
Mizoram	13,998	17,600	10,840	11,021	10,137	14,437	9,059	10,929	7,859	7,293
Nagaland	2,292	4,661	3,091	2,825	1,989	4,396	3,443	4,318	3,945	3,370
Orissa	332,046	369,777	458,554	421,928	478,056	483,095	509,497	454,541	473,223	417,276
Punjab	15,601	28,609	35,742	27,632	5,316	1,113	493	604	250	377
Rajasthan	241,255	250,780	300,547	272,670	76,438	53,154	35,973	129,233	68,627	142,738
Sikkim	58	214	49	38	15	14	16	31	53	278
Tamil Nadu	104,964	92,375	80,586	72,426	63,915	56,366	43,053	31,551	34,523	43,604
Tripura	8,871	12,503	9,843	18,122	12,595	14,408	12,245	18,502	13,319	13,807
Uttar Pradesh	89,617	105,235	169,364	134,362	112,291	99,362	96,971	94,524	90,199	81,853
Uttaranchal							2,008	1,196	1,659	2,350
West Bengal	74,283	91,014	87,686	155,209	132,088	227,480	145,322	145,053	194,421	175,739
Andaman and Nicobar Islands	1,619	1,636	1,165	972	1,247	937	1,002	925	865	753
Chandigarh	7,853	9,875	11,196	4,944	1,675	456	256	298	157	84
Dadra and Nagar Haveli	8,571	15,992	11,968	12,007	6,225	3,303	2,415	848	493	468
Daman and Diu	1,236	1,562	2,052	1,062	625	352	132	87	173	141
Delhi	4,365	7,470	10,562	8,194	4,050	3,996	2,631	1,484	1,484	810
Lakshadweep	2	1	0	2	4	1	5	0	8	6
Pondicherry	548	467	281	210	168	149	137	106	103	63
India	2,511,353	2,926,197	3,035,588	2,660,057	2,222,748	2,284,713	2,031,790	2,085,484	1,842,019	1,781,336

Directors of Health and Family Welfare for IEC/monitoring/supervision of malaria control activities in their respective regions.

5. Funds allocated for the NVBDCP during the years 2001–02, 2002–03 and 2003–04 were Rs 219.78 crore, Rs 206.81 crore and Rs 203.61 crore, respectively (Table 6).
6. Additional funds for activities for the control of kala-azar are released in cash and kind only to four States where kala-azar is endemic (Bihar, Jharkhand, West Bengal and Uttar Pradesh).

Why is malaria persisting? Challenges and constraints in implementation of the Programme

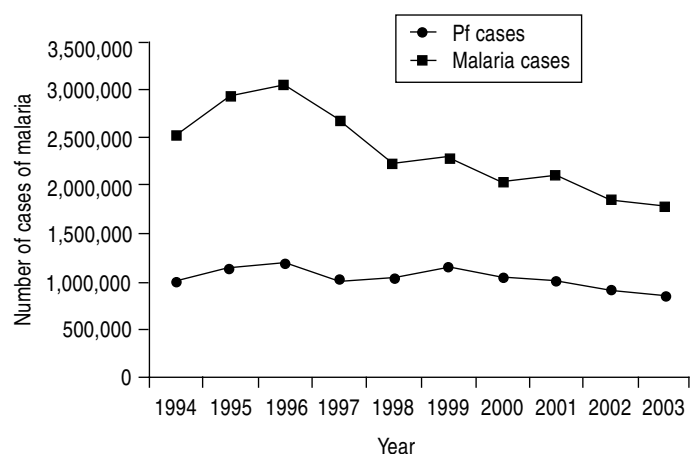
1. The 1994 Expert Committee laid down criteria for identification of 'high-risk' rural as well as urban areas and assigned the major responsibility for case detection and management of malaria cases in rural areas to the

MPW (M). However, the large number of vacancies for MPWs (M) in most States has been a major bottleneck in the effective implementation of activities for the control of malaria. Insecticidal spray operations are not performed regularly/periodically as per guidelines.

2. Some vectors of malaria have developed resistance to the insecticides currently in use. Some vectors have developed outdoor biting and outdoor resting habits. Since newer insecticides are very expensive, alternative strategies for vector control need to be implemented.
3. The number of cases of malaria has been stagnant at around 20 lakh cases annually, but the proportion of cases of *Plasmodium falciparum* malaria has increased to over 42% and this species has shown resistance to conventional antimalarial drugs. Moreover, areas reporting resistance of *Plasmodium falciparum* to drugs have been increasing. Second-line drugs for chloroquine-resistant *falciparum* malaria are available to only 1% of the population.

Table 5. State-wise distribution of number of cases of *Plasmodium falciparum* from 1994 to 2003

State/UT	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Andhra Pradesh	32,227	40,803	60,402	57,939	61,611	78,039	46,685	34,387	21,416	20,864
Arunachal Pradesh	9,352	7,512	5,686	6,730	6,935	10,263	6,966	11,025	7,080	5,977
Assam	105,477	145,153	107,742	76,548	54,769	83,064	52,116	58,961	55,825	48,668
Bihar	46,367	55,627	64,859	49,470	75,825	79,881	2,084	1,027	1,705	1,080
Chhattisgarh							246,129	201,569	170,487	144,028
Goa	275	256	1,539	5,768	8,694	5,548	2,598	3,569	3,655	1,503
Gujarat	63,494	44,932	32,091	37,849	18,531	10,617	6,672	18,958	16,244	30,895
Haryana	3,701	11,215	27,868	2,218	306	211	157	143	41	500
Himachal Pradesh	6	13	12	4	1	6	0	0	0	7
Jammu and Kashmir	48	39	69	34	18	37	23	24	10	11
Jharkhand							68,744	63,471	52,892	36,470
Karnataka	37,789	39,287	32,416	43,546	26,333	21,416	28,303	48,008	29,702	23,560
Kerala	272	553	657	659	1,064	568	373	325	375	410
Madhya Pradesh	151,440	223,718	221,080	211,537	247,196	289,187	62,850	61,140	31,545	31,390
Maharashtra	103,616	131,602	83,669	55,230	48,004	33,898	25,694	19,340	14,634	30,340
Manipur	5,314	2,161	927	801	631	1,399	380	371	601	1,168
Meghalaya	7,712	12,174	14,230	10,910	8,510	9,153	9,238	15,890	11,095	12,338
Mizoram	7,327	10,771	6,248	6,990	6,422	9,575	5,358	5,955	3,932	4,167
Nagaland	944	991	663	806	423	202	264	498	234	277
Orissa	284,346	317,204	395,896	364,723	408,509	407,942	428,032	379,432	393,547	346,311
Punjab	185	3,367	1,232	150	52	36	25	41	18	35
Rajasthan	94,020	45,027	72,329	19,554	10,030	5,875	3,425	17,405	5,356	16,481
Sikkim	8	4	2	3	2	2	1	13	7	41
Tamil Nadu	4,935	5,463	4,011	3,049	2,303	2,281	1,738	1,354	2,520	3,758
Tripura	6,975	9,103	7,112	15,491	10,507	11,889	9,480	14,629	10,863	10,800
Uttar Pradesh	7,516	7,367	20,974	11,023	5,407	6,434	6,214	4,546	2,512	1,290
Uttaranchal							424	280	120	265
West Bengal	15,392	17,226	14,725	23,545	25,156	72,755	32,465	42,596	60,726	72,232
Andaman and Nicobar Islands	270	311	215	168	183	182	236	180	158	148
Chandigarh	59	59	84	17	6	18	6	3	6	5
Dadra and Nagar Haveli	1,362	4,310	2,092	2,467	2,694	648	282	59	100	106
Daman and Diu	47	136	47	15	19	35	5	22	32	21
Delhi	22	34	682	122	16	196	249	14	14	25
Lakshadweep	0	0	0	0	0	0	0	0	0	0
Pondicherry	9	5	2	0	2	2	2	1	2	2
India	990,507	1,136,423	1,179,561	1,007,366	1,030,159	1,141,359	1,047,218	1,005,236	897,454	845,173

**Fig. 3** Number of cases of malariaPf: *Plasmodium falciparum*

- Major ecological imbalances on account of large projects such as irrigation, deforestation and paddy cultivation are continuously taking place, thereby increasing vector breeding and the epidemic potential of malaria in such areas. Involvement of the community is critical in the control of malaria through reduction of breeding sites. However, efforts at mobilizing the community, if at all, have not been successful and communities and NGOs need to be involved in a big way for controlling the disease.
- The risk of urban malaria has been constantly increasing due to urbanization and industrialization leading to mass migration of people and increase in vector breeding on account of stagnant water. Migration of labourers coming from areas with drug-resistant malaria into such areas further worsens the situation.

Table 6. Abstract summary of funds released to States for the control of vector-borne diseases (Rs in lakh)

State/Union Territory	Year											
	2001–02				2002–03				2003–04			
	In cash	In kind	Grants-in-aid to societies/ NGOs	Total	In cash	In kind	Grants-in-aid to societies/ NGOs	Total	In cash	In kind	Grants-in-aid to societies/ NGOs	Total
Andhra Pradesh	145	810	0	955	93	456	0	549	142	253	0	395
Arunachal Pradesh	203	162	0	365	201	176	0	377	93	187	0	280
Assam	1271	1,106	0	2,377	0	1,935	0	1,935	0	1,404	0	1,404
Bihar	70	804	0	874	0	198	0	198	555	1,884	0	2,439
Chhattisgarh	167	710	0	877	818	2,230	0	3,048	475	1,212	0	1,687
Goa	0	6	0	6	0	8	0	8	0	0	0	0
Gujarat	195	1,158	0	1,353	245	523	0	768	82	247	0	329
Haryana	0	18	0	18	0	67	0	67	0	37	0	37
Himachal Pradesh	0	37	0	37	0	12	0	12	0	5	0	5
Jammu and Kashmir	0	70	0	70	0	382	0	382	0	72	0	72
Jharkhand	89	793	0	882	396	956	0	1,352	54	1,103	0	1,157
Karnataka	0	386	0	386	0	227	0	227	0	205	0	205
Kerala	0	68	0	68	0	13	0	13	63	47	0	110
Madhya Pradesh	362	2,180	0	2,542	681	1,727	0	2,408	142	1,115	0	1,257
Maharashtra	235	2,054	0	2,289	293	655	0	948	244	115	0	359
Manipur	144	131	0	275	72	74	0	146	61	13	0	74
Meghalaya	166	127	0	293	62	240	0	302	99	226	0	325
Mizoram	136	210	0	346	35	156	0	191	148	128	0	276
Nagaland	144	225	0	369	75	297	0	372	146	245	0	391
Orissa	290	1,455	0	1,745	239	2,792	0	3,031	545	1,793	0	2,338
Punjab	0	94	0	94	0	66	0	66	0	38	0	38
Rajasthan	84	841	0	925	41	883	0	924	143	1,272	0	1,415
Sikkim	0	0	0	0	0	4	0	4	2	4	0	6
Tamil Nadu	0	289	0	289	0	187	0	187	0	111	0	111
Tripura	215	291	0	506	0	390	0	390	152	287	0	439
Uttar Pradesh	0	671	0	671	0	607	0	607	27	578	0	605
Uttaranchal	0	40	0	40	0	2	0	2	0	39	0	39
West Bengal	25	1,116	0	1,141	0	519	0	519	126	386	0	512
Andaman and Nicobar Islands	190	30	0	220	185	45	0	230	181	23	0	204
Chandigarh	27	8	0	35	24	14	0	38	25	0	0	25
Dadra and Nagar Haveli	18	23	0	41	16	0	0	16	24	37	0	61
Daman and Diu	9	10	0	19	7	1	0	8	15	4	0	19
Lakshadweep	5	1	0	6	5	0	0	5	12	0	0	12
Pondicherry	1	7	0	8	1	12	0	13	8	3	0	11
Delhi	4	85	0	89	0	60	0	60	0	81	0	81
Total	4195	16,016	0	20,211	3489	15,914	0	19,403	3564	13,154	0	16,718
Estt/Pub/Res	1767			1,767	1278			1,278	3643			3,643
Grand total	5962			21,978	4767			20,681	7207			20,361

Recommendations

Since reliable information on the occurrence of malaria and other VBDs in India is very limited, getting information from the private sector is crucial. In a large number of cases, PPs treat cases of fever for malaria on the basis of symptoms alone rather than basing their diagnosis on a blood smear examination. Even in the public sector, there is a large backlog of peripheral blood smear slides for examination due to the large number of vacancies of LTs at PHCs and CHCs. It is evident that for improving the

health outcomes of the people, a health team should be in position and LTs and MPWs (M) are important constituents of the health team. Thus, vacant posts of LTs and MPWs (M) need to be filled, especially in peripheral health institutions so that health improvement in the population can be assured. Filling up the posts of MPWs (M) will reduce the burden on the ANM and she might then be able to deliver maternal and child care services more efficiently and effectively.

Vectors are an important link in the transmission of

malaria and other VBDs, and integrated vector control activities need to be implemented for controlling the burden of VBDs. The success achieved in the control of malaria in the 1950s and 1960s was primarily due to control of the vector. The community should be actively involved in activities aimed at controlling the vector—reduction of vector breeding places (preventing water stagnation, ensuring that overhead tanks are covered with lids, draining the water from coolers and drying them once a week, pouring mineral oil over collections of water in the open), and protection against bites by vectors by using bednets and mosquito repellants. In addition, the community could be given the responsibility of monitoring insecticide spray operations in the area. Integrated activities for vector control are crucial for the containment of malaria as undue reliance on insecticide spraying is bound to lead to resistance of the vector against the insecticide, and already there are areas where the vector has shown resistance against DDT. Synthetic pyrethroids have now been introduced as the insecticide in such areas.

There are reports of drug resistance of *Plasmodium falciparum* against firstline drugs and newer drugs are being introduced under the Programme only now. Since most patients with malaria reportedly consult the private sector in the first instance, involvement of the private sector is crucial for ensuring complete treatment of identified cases of malaria so that the problem of drug resistance of the parasite can be contained.

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