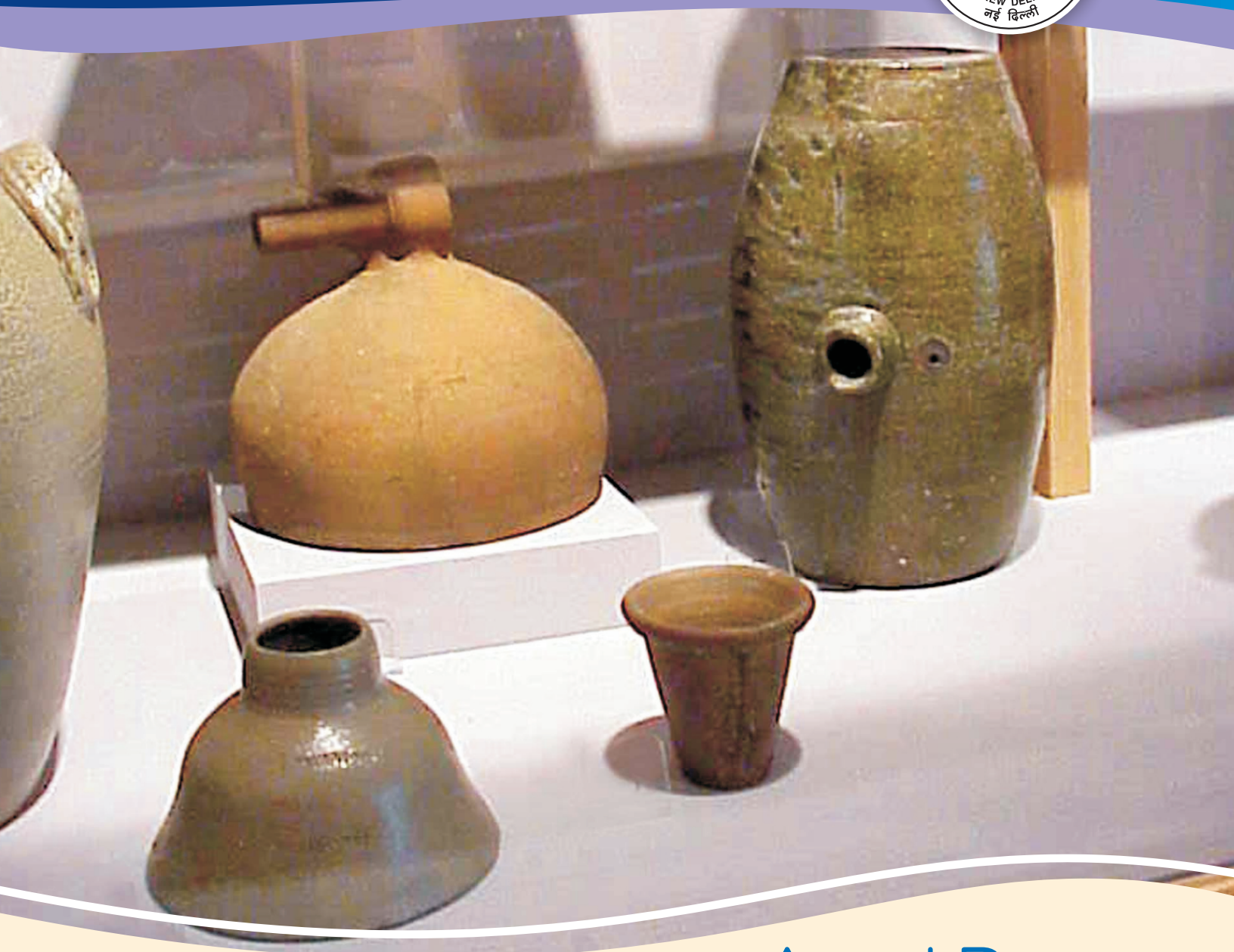
Regional Medical Research Centre for Tribals

(Indian Council of Medical Research)
JABALPUR



Annual Report

2006-07

PREFACE

It gives me immense pleasure to present the annual report of the centre for the year 2006-07.

The new achievement during this period has given a phenomenal boost to the expanding activities of the centre a step towards achieving excellence in science. The centre endeavor to achieve good health of the community by its promising research projects, advocacy etc. The centre is likely to initiate six new but challenging projects. Add to this the centre also received extramural funds for five new projects from the agencies like MP Council of Science and Technology, UNICEF, NACO, WHO-SEARO, ICMR, etc. Hon'ble Minister for Heath, Government of Madhya Pradesh has visited the centre in the recent past and also invited some projects for financial support. The centre also achieved the best bio-diversity award in the Jabalpur commissionerate as part of its multi faceted activities.

The research outcomes and methodological developments of the centre are disseminated in the form of research papers/concept papers in national and international conferences and symposiums. Predominantly a research institute, its academic activities are well reflected as different scholars/students are pursuing their Ph.D and post graduation dissertation work in bio-medical and allied disciplines under the able guidance of the experts at the centre. The scientists of the centre are quite enthusiastic, hard working and come up with vibrant out come. It is worth mentioning that during this period seven scientists of the centre attended and presented papers in the prestigious international conferences held at Scotland, Brazil, Bangkok and New York. Papers are also published in journals/books of national and international repute.

We have organized a National Symposium on Tribal Health an interdisciplinary forum which gathers delegates, scientists, academicians, and scholars etc. from all over the country and also from prestigious CDC, LSTM, LSTH, WHO, USAID etc. The Proceedings of Symposium is under preparation. There is a proposal to organize an international workshop on emerging and reemerging infectious diseases on October 16-19, 2007 at the centre. We have received an overwhelming response from both national and international delegates for their participation.

I will be failing in my duties if I do not acknowledge the constant support and guidance provided by Lt. Gen. D. Raghunath, SAC Chairperson, who is always a source of inspiration for the scientists of the centre. It is my privileged opportunity to thank Prof. N. K. Ganguly, Director General, ICMR for his approval designated for the construction of international hostel in the premises and renovation of the laboratories with modern facilities for the greater interest of research. His interest, encouragement and continuous motivation have helped us to achieve the standard and build up a niche in the arena.

Neeru Singh
Director

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1. GENETIC DISORDERS

1.1 Prevalence of deletional form of alpha thalassaemia type in Scheduled Caste and Scheduled Tribes of Nimar area of Madhya Pradesh

Haemoglobinopathies in the form of sickle haemoglobin and -thalassaemia is very common in Nimar area with a prevalence of 18.5% and 1.6% respectively in the Scheduled tribe and Scheduled caste population. The co-existence of -thalassaemia type II in sickle cell disease and -thalassaemia is stated to reduce the disease severity. -thalassaemia is also stated to provide protection against severe form of malaria. The status of -thalassaemia is not known for Nimar area. The typing of the deletional form of -thalassaemia type II was done by PCR using allele specific primers.

In Nimar area - $^{3.7}$ deletional allele dominate the $^{+}$-thalassaemia type II contributing about 93% of allele. Bhil showed the highest prevalence of $^{+}$-thalassaemia i.e. 68% had at least one -gene deleted. Surprisingly, the Bhil group or tribes i.e. Bhil, Bhilala and Barela did not have - $^{4.2}$ allele but it was found in Korku tribe. Least prevalence of $^{+}$-thalassaemia type II was in Balai Scheduled caste (Table 1.1.1).

Table 1.1.1 : Prevalence of deletional form of $^{+}$-thalassaemia in Scheduled Caste and Scheduled Tribes of Nimar area of Madhya Pradesh

Population	N	/	- /	- /-
Korku	**26**	6	10	10
Bhil	**50**	11	10	29
Barela	**91**	33	9	49
Bhilala	**71**	43	9	19
Balai	**79**	51	18	10
Total	**317**	144	56	117

$^{+}$-thalassaemia type II did show the typical mild microcytic, hypochromic mild anaemic effect on RBC in its homozygous state. As expected it also lowered the HbA_2 and HbF level slightly (Table 1.1.2). These differences were statistically insignificant.

Table 1.1.2 : CBC profile and alpha thalassaemia in Nimar area of Madhya Pradesh

No. of -gene.	N	Hb	PCV	TRBC	MCV	MCH	MCHC	HbF	HbA_2
/	144	11.6 1.9	31.2 5.5	4.3 0.7	73.1 10.9	27.4 4.5	37.4 2.5	1.2 1.0	2.4 0.7
- /	56	12.0 1.6	33.9 5.1	4.5 0.6	75.4 8.1	26.7 3.6	35.5 3.0	1.1 0.3	2.4 0.8
- /-	117	10.8 1.8	29.6 4.6	4.6 0.7	65.1 7.4	23.7 3.4	36.3 2.8	1.1 0.3	2.1 0.7

1.2 Prevalence of common haemoglobinopathies and G6PD deficiency in Scheduled caste and Scheduled tribes of district Damoh of Madhya Pradesh

It is a part of ongoing activity of the centre to map the prevalence of common haemoglobinopathies in various Scheduled castes and Scheduled tribes populations at micro level. The total population of district Damoh (Census 2001) is about 10.8 lacs and the Scheduled tribe and Scheduled caste population is 12.6% and 19.5% respectively. The main tribal population is Gond and the main Scheduled caste is Chaudhary (Chamar). Both these populations practice strict non-consanguineous caste/ tribe endogamy but gotra exogamy marriage practices. The study population was drawn from two Tehsils i.e. Jabera and Tendukheda which has high concentration of Scheduled tribes. Gond and Chaudhary dominated villages were selected randomly from the blocks of Jabera, Sangrampur, Nahata, Tendukheda, Taradehi. The blood sample are being analysed for common haemoglobinopathies. The data generated so far suggest that prevalence of G6PD deficiency is higher among Gonds (9.3%) and it was 1.8% in Chaudhary (Table 1.2.1).

Table 1.2.1 Prevalence of G-6-PD deficiency in Damoh district

Population	N	G6PD deficiency
Gonds	321	30 (9.3)
Chaudhary	339	6 (1.8)

Anaemia was more common in Gond tribe (71.9%) as compared to Chaudhary (31.8%). Most of these anaemic cases were of mild category. Females and children (<12 years) were more prone to anaemia as compared to males in both the population groups (Fig. 1.2.1 & 1.2.2). Prevalence of iron deficiency, as judged by estimation of free erythrocyte protoprophyrin level, was less in comparison to prevalence of anemia. All severe anaemic and about half of moderate anaemic persons were having deficiency of iron. Anaemia in the study area is caused by many other factors like common infections, worm infestation and $^{+}$-thalassaemia type II etc. The analysis of samples for sickle haemoglobin, -thalassaemia and $^{+}$-thalassaemia type II is in progress.

Fig 1.2.1 Percent prevalence of anaemia and iron deficiency in Gond tribe of district Damoh, M.P.

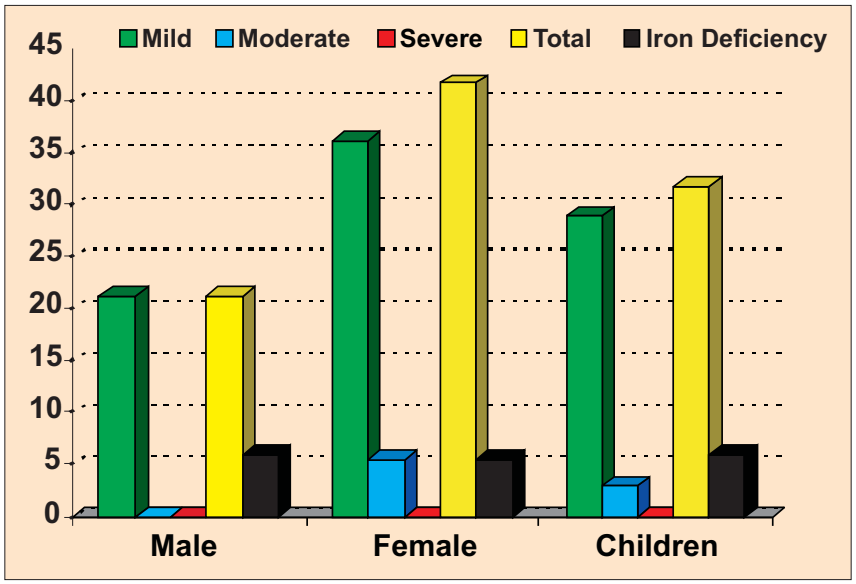
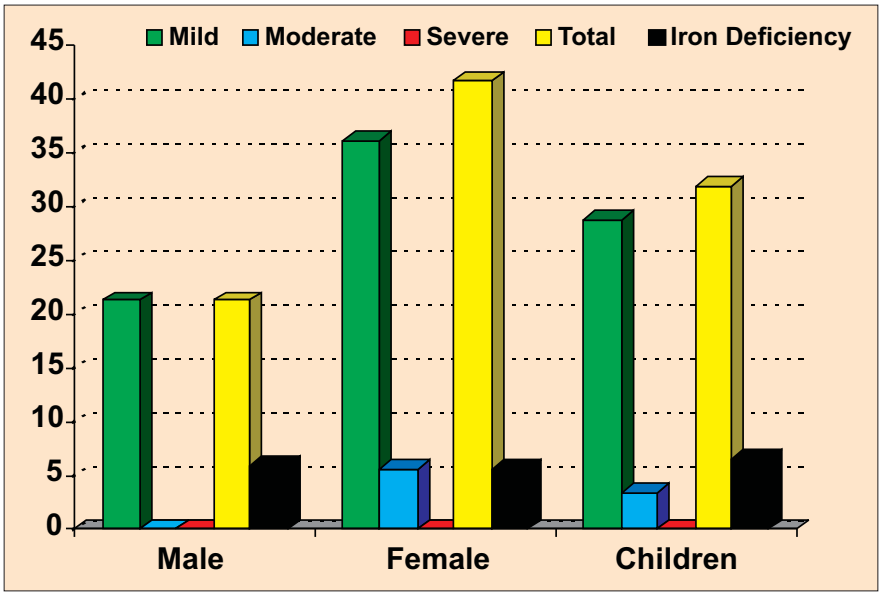


Fig 1.2.2 Percent prevalence of anaemia and iron deficiency in Chaudhary Scheduled caste of district Damoh, M.P.

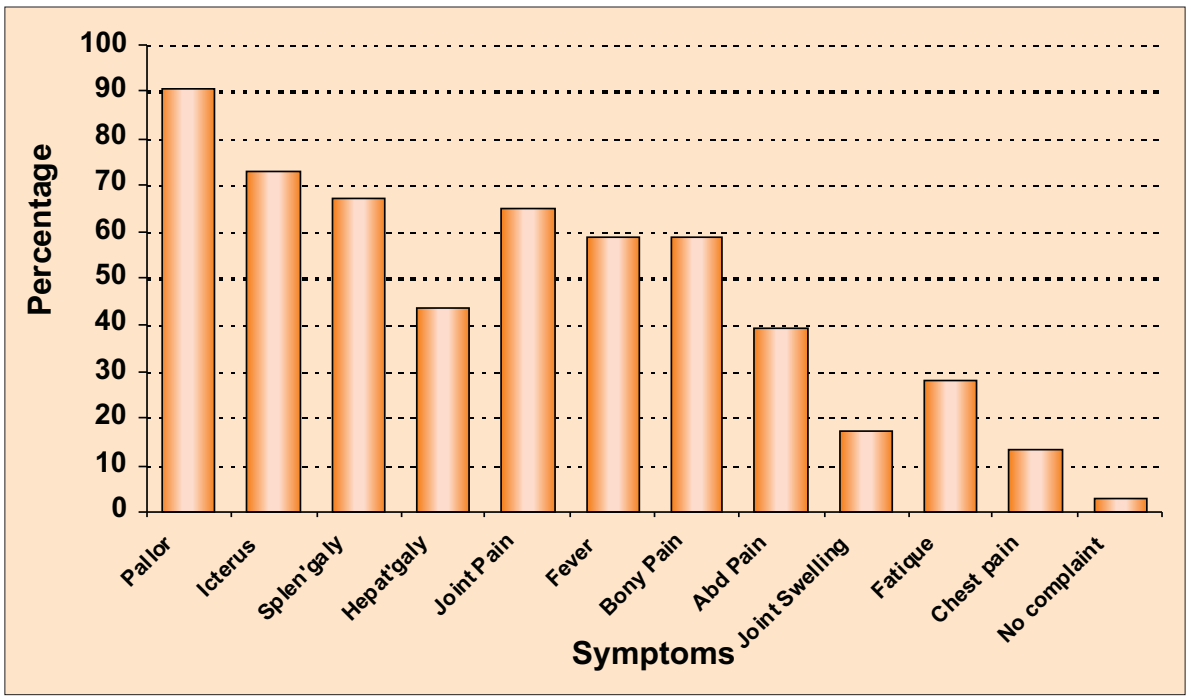


1.3 Morbidity profile of sickle cell disease in Central India

In the year 2006-2007, 41 new patients of sickle cell disease (SCD) were enrolled in the clinic making a total of 395 patients. Till date we have followed the 42 SCD patents for 3 years and 31 patients for 4 years and 243 patients for more than a year. These patients were evaluated clinically as per structured proforma after obtaining written consent.

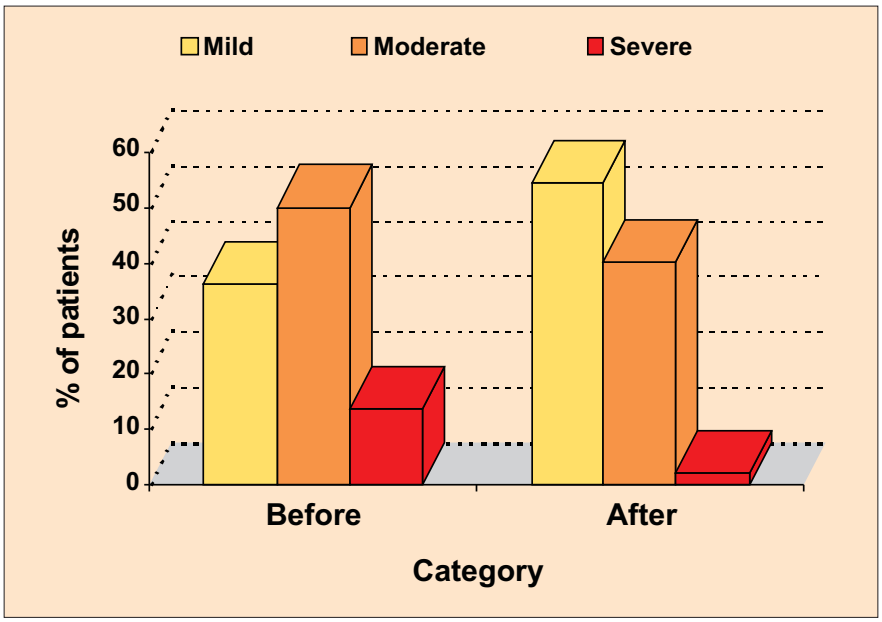
The common signs and symptoms of sickle cell disease in 41 patients are given in Fig. 1.3.1. About three-fourth of these patients are below 15 years and belong to Scheduled castes, tribes and OBCs groups. Beside clinical anaemia, splenomegaly, joint and bony pain with fever is the most common symptoms. About 3% of the patient did not reveal any symptom of typical sickle cell disease other than clinical anaemia. Most of the patients with abdominal pain reported pain at splenic site.

Fig 1.3.1 Common signs and symptoms in sickle cell disease



Patients/ and their parents were advised to avoid disease precipitating/ or aggravating factors like exposure to extreme climate, excessive exercise, dehydration etc. They were given 5 mg of folic acid daily and anti-pyretic and anti-inflammatory drugs on SOS basis. They were told to seek appropriate medical intervention quickly upon any minor ailment. Patients were advised to take enough water/fluids. They were asked to re-visit for clinical examination every three months. Patients were given symptomatic treatment as outdoor patients and were referred to respective clinic in case of emergency. Most of the patients responded well with simple antipyretic and anti-inflammatory drugs during ordinary painful crisis at home. There was marked reduction ($p<0.001$) in clinical severity of the disease by providing simple intervention (Fig. 1.3.2).

Fig. 1.3.2: Effect of intervention on sickle cell disease

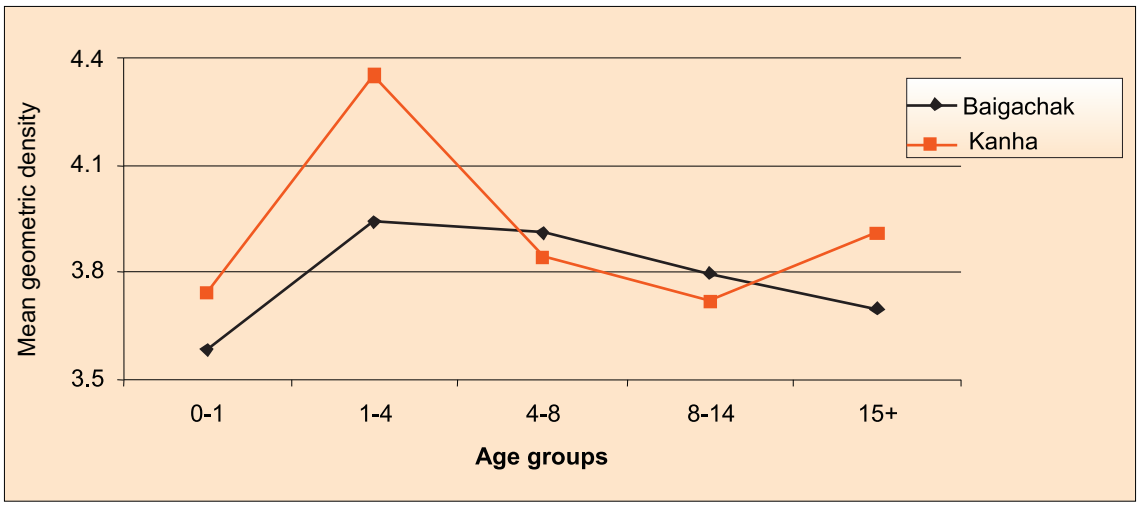


2. VECTOR BORNE DISEASES

2.1 Transmission dynamics of malaria in tribal areas

Longitudinal study covering epidemiological, entomological and socio-cultural aspects is being carried out in 2 highly malaria endemic districts of M.P. So far 4080 and 1702 blood slides from Baiga chak and Kanha respectively has been collected through active fever survey. Malaria is significantly more in Baiga chak than Kanha villages despite regular spray of Synthetic Pyrethroid and changed drug policy under national program as per the recommendations of this study. *P. falciparum* is predominant at both the sites, which is around 90% of all the malaria cases. Parasite count (per microlitre of blood) of *P. falciparum* positive cases reveals geometric mean parasite density of 3.82± 0.75 (6636) at Baiga chak and 3.88± 0.710 (7732) at Kanha. Statistically the difference is not significant at both the sites. Age group wise analysis of parasite count shows lowest parasite density in infants and highest in children of 1-4 year age group. The difference is highly significant ($p<0.01$). The trend is similar at both the sites (Fig. 2.1.1).

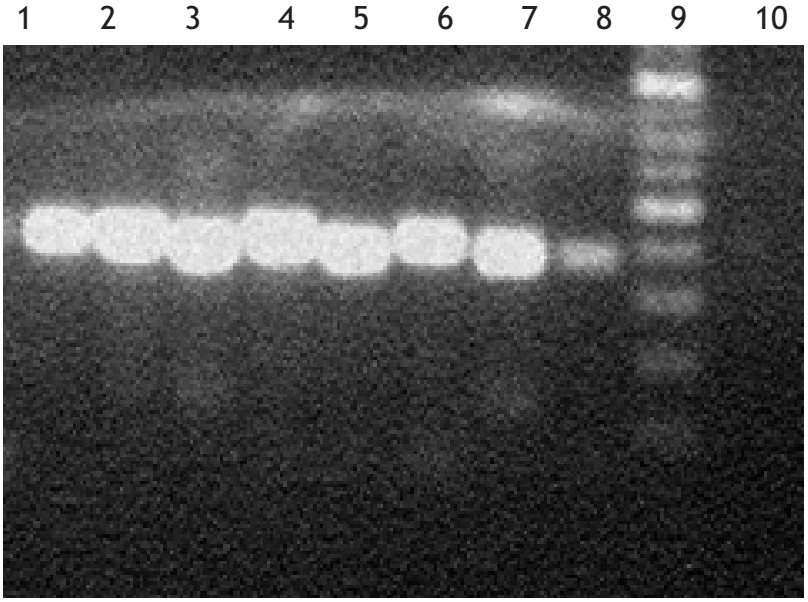
Fig 2.1.1: Parasite density of P. *falciparum* malaria in study areas



Biting rhythm of Anophelines vector has been studied using animal bait and light trap between 6.00 P.M. to 6.00 A.M. In all 70 and 78 whole night collection in all the season were carried out. Per night per bait catches of Anophelines vector (*An. culicifacies*) were more in Kanha (7.12) than Baiga chak (1.57). Similarly per light trap per night collection were more in Kanha (3.0) than Baigas(0.2). Anopelines and *An. culicifacies* bites throughout the night. Peak biting was recorded between 7.00P.M to 10.00 P.M for *An. culicifacies* at Kanha while no clear cut trend was seen in Baiga chak. On the contrary per night per light trap catches of *An. fluviatilis* were more in Baiga chak (2.5) than kanha (1.0).

Specimens of *An. fluviatilis* collected during monsoon and post monsoon months from Baiga chak and Kanha were identified for sibling species composition using PCR techniques. Species S constitutes 17% from Baiga chak while only T was recorded from Kanha (Fig. 2.1.2).

Fig 2.1.2: Results of PCR

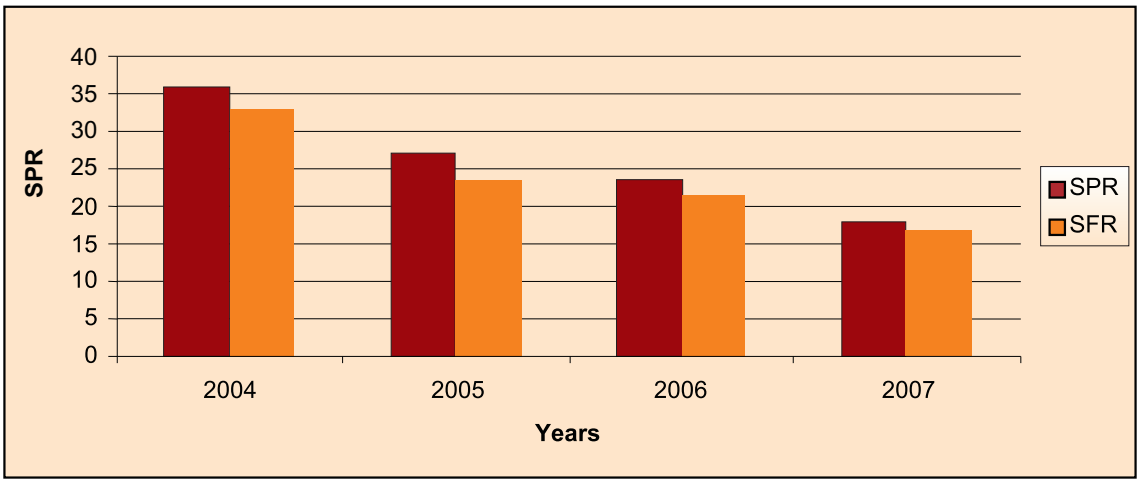


Two hundred seventy seven specimens of *An. culicifacies* were examined for their parity status. Parity rates were found to be fifty six and sixty five from Baiga chak and Kanha area respectively.

Socio-cultural and KAP data from 338 and 240 households (HH) from Baiga chak and Kanha have been collected. Ninety eight percent households cook food inside the living room in Baiga chak area while the percentage in Kanha was around 67%. About 50 and 10% households have bed nets in Baiga chak and Kanha respectively. All nets were supplied by govt. agency in Baiga chak while in Kanha all bought bed nets from market of their own. Only 43 and 56% households respectively in Baiga chak and Kanha used net last night.

A gradual declining trend in malaria prevalence is recorded due to intensive intervention measures and number of malaria cases in study villages reduced from 562 in 2004 to 293 in 2005 and 196 in 2006. Only 30 malaria cases have been recorded till June 2007. Similar trend is seen in *P. falciparum* cases (Fig. 2.1.3).

Fig 2.1.3: Declining trend of malaria prevalence in Baiga Chak

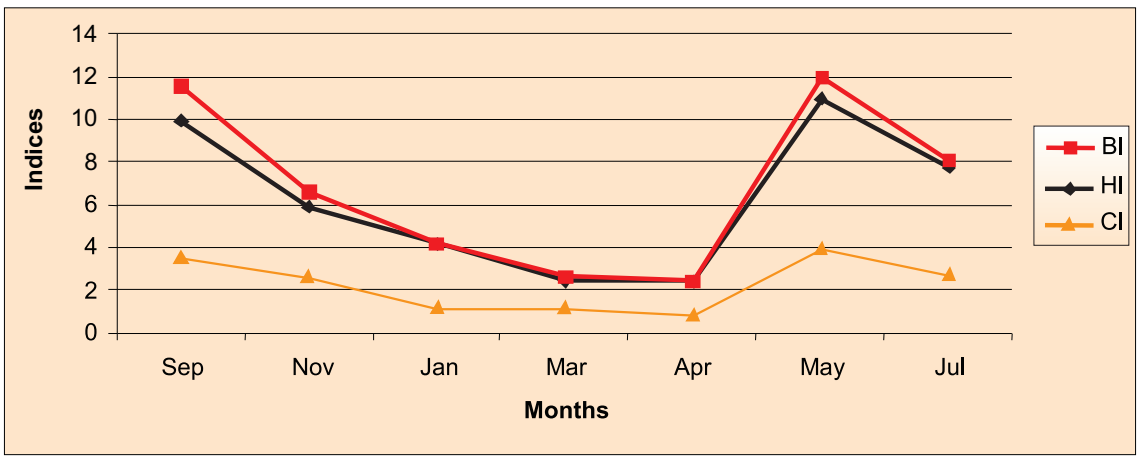


2.2 Prevalence of dengue vector *Aedes aegypti* in Jabalpur

Longitudinal study is being carried out to study the dynamics of immatures of dengue vector in Jabalpur Municipal corporation area and its peripheral area. Over all 2505 households having 7380 water filled containers were examined for the presence of *Aedes* immatures. One hundred fifty two households were found having *Aedes* infested containers (166 infested containers). Over all house, Breteau and container indices (HI, BI & CI) were 6.0, 6.64 and 2.24. Indices are within the threshold limits. The distribution of the vector is not uniform as recorded in earlier surveys. Central and Western (Garha) areas continue to have higher prevalence of *Aedes aegypti*.

Month wise prevalence: Month wise analysis of data shows that *Aedes aegypti* is prevalent through out the year. The prevalence rises with onset of summer when residents are forced to store water. There are two peaks for prevalence of *Aedes aegypti* one in pre monsoon and other in post monsoon season (Fig. 2.2.1).

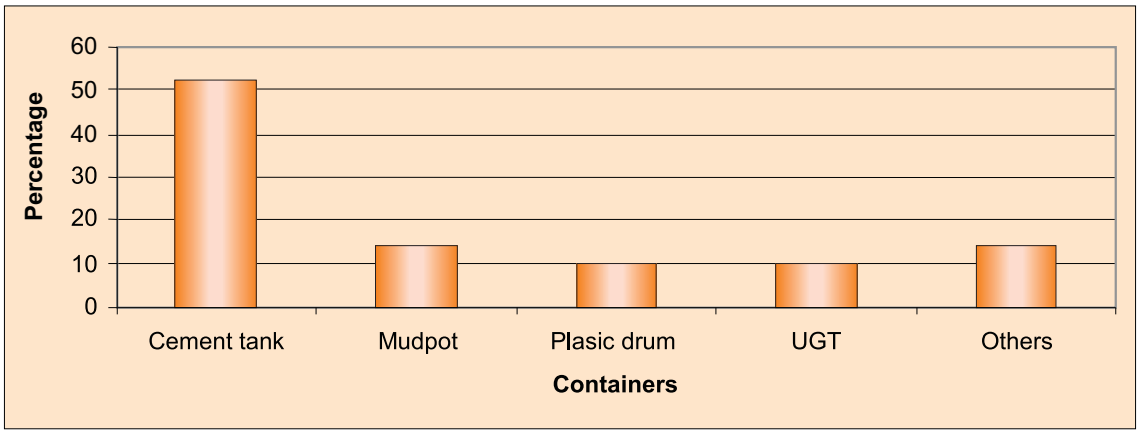
Fig 2.2.1: Month wise HI, BI and CI in Jabalpur



Water filled containers were classified in twenty categories and seventeen of these were supporting *Aedes aegypti* breeding. Cement tank were the most preferable breeding site followed by under ground tank and cement cistern. Over Ninety percent *Aedes* infested containers are being used for storage of water for routine use. No breeding was recorded from overhead tank (plastic and cement both). Plastic container and plastic drums support breeding occasionally.

Pupal population: Among the infested containers 34% were having standing crop of pupa. In all 7670 pupa were collected from 56 infested containers. About 52% of standing pupal crop was recorded from cement tanks, which is significantly higher than any other container supporting pupal population i.e. mud pot, under ground tank and plastic containers (Fig. 2.2.2).

Fig 2.2.2: Distribution of standing pupal crop in different containers



Species Composition: Specimens of *Aedes* and *Anopheles* genera larva collected from different habitat were reared up to the adult stage. *Aedes aegypti* composes 93% of all the specimens. *Aedes vittatus* was also found in all the major breeding habitats while *Aedes albopictus* was found mainly in mud pots. Only two species of Anopheles genera *An. stephensi* (94%) and *An. annularis* was recoded breeding in domestic containers.

Virus Activity

Following the unusual reporting of fever cases in private hospitals, a door to door surveillance was carried out to collect blood samples from febrile and from those having history of fever during last four days in three areas, viz. Gwari Ghat, Central and Ranjhi. Thirty seven blood samples were collected intravenously from these areas. Dengue IgM antibody was detected using Pan Bio ELISA Kit. Fifteen samples (40%) were found positive for Dengue antibody (Table 2.2.1). Gwari Ghat and Central areas were the worst hit where stegomyia indices were relatively high for the last several months. Among positive

cases only three (20%) were children (less than 14 years) and rest all were from higher age groups. Apart from these active cases detection, 10 more samples received from hospitals. Out of these ten cases five were positive for dengue.

Table 2.2.1: Details of the sample studied in different areas

Area	No. tested	Positive for dengue IgM	Percentage
Gwari Ghat	20	9	45
Central	10	4	40
Ranjhi	7	2	28
Total	37	15	40

2.3 Evaluation of first response combo Malaria Ag card test (pLDH/HRP2)

A new rapid first response card test by PMC Medical (India) Pvt. Ltd. was evaluated for both *P.falciparum* and *P.vivax* in comparison with microscopy as gold standard. The test is designed for the differential diagnosis between *P.falciparum* and other plasmodium species. In all 284 patients clinically suspected to have malaria were tested using this test in Jabalpur district by field team (Table 2.3.1). The sensitivity and specificity of test for *P.falciparum* were 97 and 95% respectively with PPV and NPV of 85 and 99% respectively (Table 2.3.2). For *P.vivax* the test is relatively less sensitive as the sensitivity and specificity of the test were 85 and 95% with PPV and NVP of 96 and 97% respectively.

Table 2.3.1: Results of first response combo malaria Ag (pLDH/HRP2) card test and microscopically examination of thick blood smears

Test Result	Microscopy Result			
	P.falciparum	*P.viavx*	Negative	Total
P.falciparum	63	0	11	74
***P.vivax* (other malaria)**	1	34	14	49
Negative	1	6	154	161
Total	65	40	176	284

The sensitivity and specificity are dependent on parasite density. When the parasitaemia was 200 parasites/l of blood the test is 100% sensitive for *P.falciparim* and 95% sensitive for *P.vivax*. Overall, the test is easy to learn, reliable and rapid under extreme climatic condition (high temperature, high humidity). The test is a potential alternative to microscopy particularly in places where the facility for microscopy are poor or non existent or where urgent results are required. The ability to use the test to distinguish *P.falciparum* from non *falciaprum* species is of great significance in areas where both *P.falciparum* and *P.vivax* are common.

Table 2.3.2: Performance of first response combo malaria Ag card test relative to those of microscopically examination of 284 blood smears

(Pooled *P.falciparum* + *P.vivax*)	
Sensitivity (95% CI)	93.33 (86.27-97.05)
Specificity (95% CI)	86.03 (79.88-90.59)
PPV (95% CI)	79.67 (71.27-86.18)
NPV (95% CI)	95.65 (90.90-98.08)
Accuracy (95% CI)	88.73 (84.33-92.05)
J index	0.79
P.falciparum	
Sensitivity (95% CI)	96.92 (88.36-99.46)
Specificity (95% CI)	94.98 (90.95-97.34)
PPV (95% CI)	85.13 (74.53-91.99)
NPV (95% CI)	99.05 (96.23-99.83)
Accuracy (95% CI)	95.42 (92.11-97.44)
J index	0.92
P.vivax	
Sensitivity (95% CI)	85.00 (69.48-93.75)
Specificity (95% CI)	93.85 (89.86-96.40)
PPV (95% CI)	69.39 (54.42-81.32)
NPV (95% CI)	97.45 (94.26-98.96)
Accuracy (95% CI)	92.61 (88.76-95.25)
J index	0.79

2.4. Preparation of a field site for Malaria vaccine trial in and around Jabalpur, Madhya Pradesh

The overall objective of the study is to develop a well-characterized site, where the epidemiology of the disease, immune responses to malarial antigens, diversity of parasite genes, malaria paradigm changes and vector characteristics are well understood. This site would be useful for testing of any tools for the control and prevention of malaria, such as antimalarial vaccines and diagnostic reagents. The study has four arms which are as under:

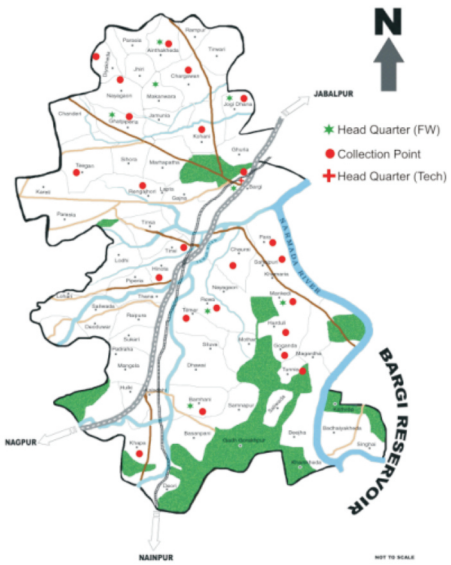
(A) Epidemiology
(B) Immuno Epidemiology
(C) Molecular Epidemiology
(D) Entomology

The progress of work done under each arm of study is as under:

(A) Epidemiologic study

Baseline population of the study area is 32,700 residing in 5813 households of 62 villages (Fig. 2.4.1). Average family size is 5.6 per household. This population is mainly ethnic 'Gond' tribes (54.4%). Sex ratio is 959 female/ 1000 male populations.

Fig. 2.4.1: Map of Bargi PHC showing study villages



Pregnant women (PW) were identified and enrolled in the study with or without fever after obtaining written informed consent. At the time of enrollment, data concerning reproductive history indicators were collected. Each woman was followed every month during her pregnancy.

Mother-infant pairs were followed-up every month after delivery. Questionnaire was filled during follow-up to obtain information on each child's health and axillary body temperature etc. Simultaneously father and siblings were also enrolled after delivery and followed up every month for clinical signs and as symptoms associated with malaria and anti-malarial treatment.

Separated Plasma was used in the Immunological study component and red cells were used in Molecular Biological study component. G6PD and sickle cell trait were examined in all enrolled subject.

In addition to the above study, fever surveys were also carried out fortnightly to measure the rate of morbidity and mortality in all age groups in the cohort area.

Treatment: All fever cases were given presumptive treatment and all subjects found positive for malaria were treated as per guidelines of National Vector Borne Disease Control Programme (NVBDCP) within 24 hrs.

Enrollment: At enrollment a total of 37 PW were found positive for malaria (16 Pv, 21 Pf) of which only 14 were symptomatic and remaining 23 asymptomatic. During the follow up a total of 36 PW were found infected for malaria (17 Pv, 19 Pf) of which 37% were febrile (Table 2.4.1). Thirty eight percent infected PW having repeated episode of malaria during their pregnancy and post pregnancy (Table 2.4.2). Mean haemoglobin of these PW were 10.04 ± 1.71 gm% (4.7 16.6). Mild anemia (9.86±0.55 gm%) was recorded in 52% of the subjects, moderate anemia (8.30±0.52 gm%) in 23% and severe anemia in 3% (6.38±0.66).

Table 2.4.1: Malaria infection in the study subject at enrollment & during followup

Study Subject	Enrolled (E) / Followup (F)	+ve	No. of Parasite (Parasite density/ l)	
			Pv	Pf
Pregnant women (N=1100)	E	37	16(1800/ l)	21(1080/ l)
	F	56	17(2400/ l)	19(3280/ l)
New born (N=678)	E	2	1(160/ l)	1(1040/ l)
	F	5	2(3360/ l)	3(1080/ l)
Father (N=217)	E	1	1(3020/ l)	0
	F	0	0	0
Sibling (N=113)	E	1	1(160/ l)	0
	F	0	0	0

Table 2.4.2: Malarial episode among pregnant women

No. of Pregnant Women	Repeated Episodes
8	2
4	3
1	4 (first 3 Pf and 4th one is Pv)
1	5 (first 3 Pf and 4th & 5th one is Pv)
23	1



Processing of placenta

Fever Survey: Active fever survey in the cohort area was started from July 2006. Both *P. vivax* and *P. falciparum* were prevalent in the study area and as the transmission season progress there was steady increasing trend in Pf ratio from 28 to 83% (Fig. 2.4.2). Overall SPR is 14 and Pf% is 64%. The age group >4-14 years is highly susceptible for malaria (Fig. 2.4.3) as compared to other age groups combined (OR=2.34; 95% CI 2.04-2.69).

Figure 2.4.2: Malaria prevalence in cohort area

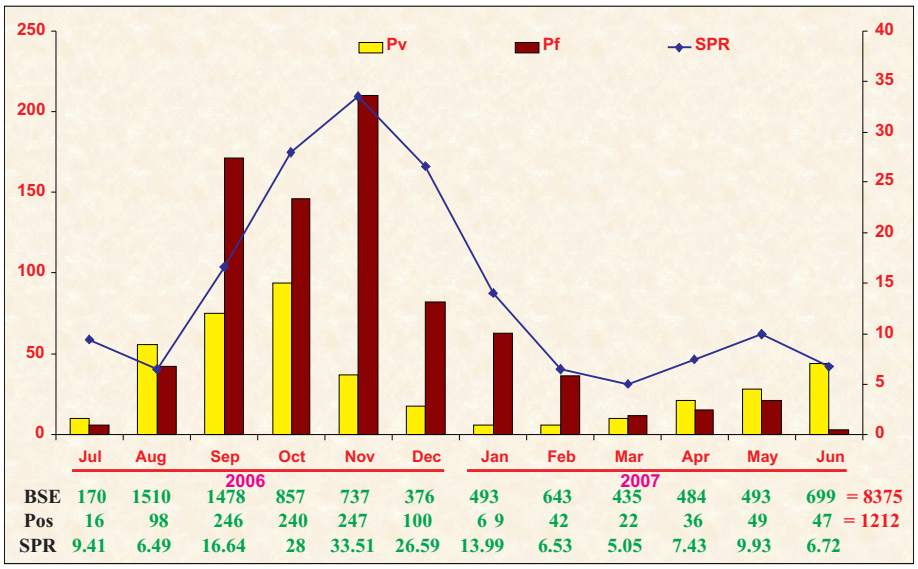
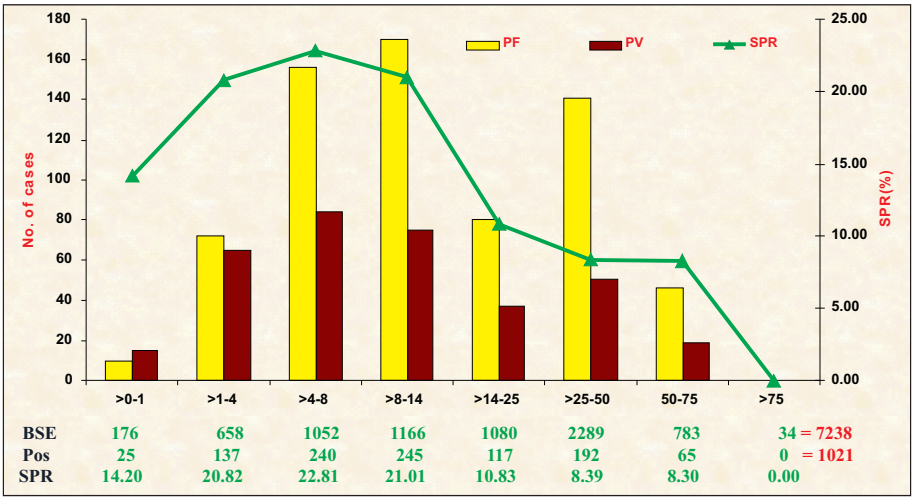
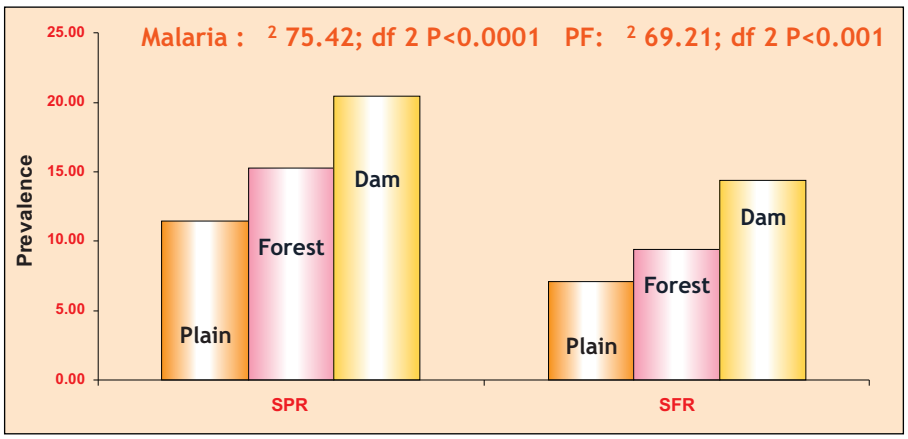


Figure 2.4.3: Malaria prevalence by age groups in cohort area



Further analysis revealed that the highest malaria prevalence was recorded in the villages surrounded by the dam reservoir (20.5%) as compared to the forested villages (15.4%) (OR 0.70; 95% CI 0.57-0.86) and plain villages (11.5%) (OR 0.50; 95% CI 0.43-0.60) (Fig. 2.4.4). Similarly the prevalence of *Plasmodium falciparum* was also found to be relatively higher in the villages surrounded by the dam reservoir (14.4%) then the forested villages (9.4%) (OR 0.62; 95% CI 0.48-0.78) and the plain villages (7.1%) (OR 0.45; 95% CI 0.37-0.55) (Fig. 2.4.4).

Figure 2.4.4: Malaria prevalence in cohort area (site wise)



Hospital based study: In the hospital based cross sectional surveys, the enrollment of patients was started in Nov 2006. Patient in each group was enrolled as defined in protocol and blood samples were collected for immunological and molecular biology study with particular reference to establish correlation with clinical severity of the disease and serum cytokine levels e.g. TNF-alpha, IFN-gamma, IL-12 etc. Enrolled patients were summarized in table 2.4.3.

In addition, all fever cases coming to Civil Hospital Maihar, were also screened for malaria (Fig 2.4.5). Age group >4-14 years were highly susceptible for malaria as compared to other age groups combined (OR=1.79; 95% CI 1.54 - 2.09) (Fig. 2.4.6).

Table 2.4.3: Hospital based cross sectional study

Case distribution (N=75 in each category)	Sample Collected
Severe malaria anemia (Hb <5 g/dl)	31 (3.94 ± 0.67)
Moderate malaria anemia (Hb 5 & 7.9 g/dl)	65 (6.65 ± 0.79)
Mild malaria anemia (Hb 8 & 10.9 g/dl)	75 (9.37 ± 0.78)
Cerebral malaria	50
Uncomplicated malaria	74 (12.8 ± 0.1.56)
Acute Renal failure	14

Figure 2.4.5: Malaria prevalence at civil hospital Maihar, Satna

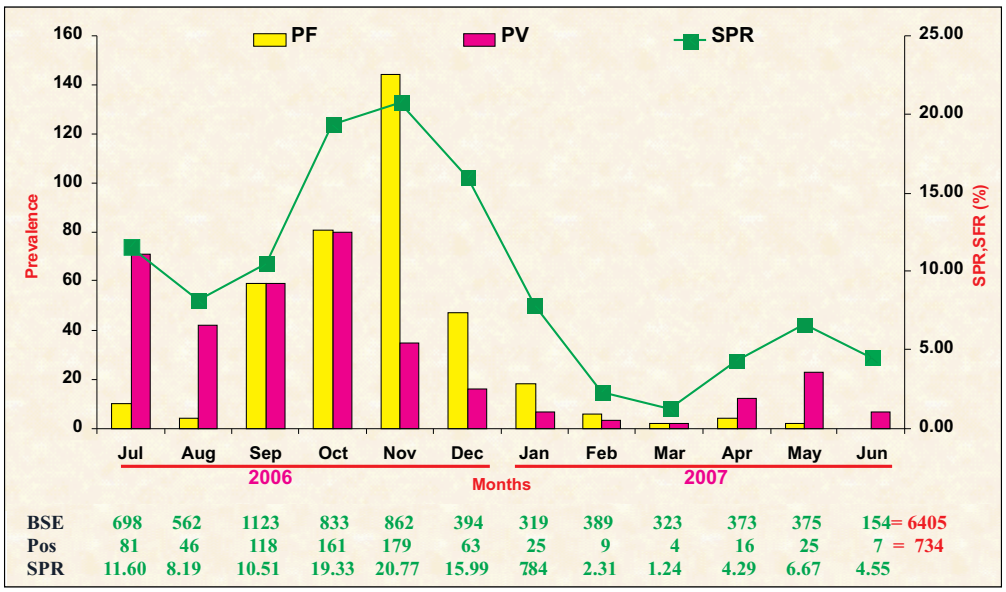
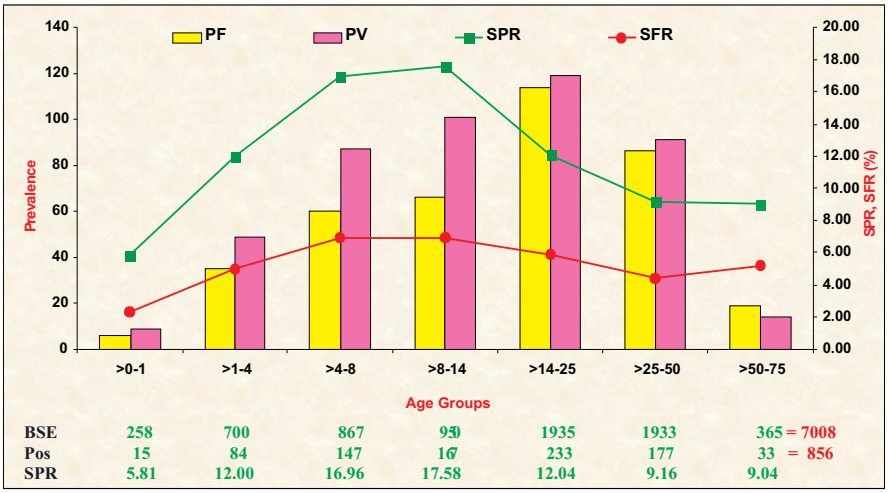


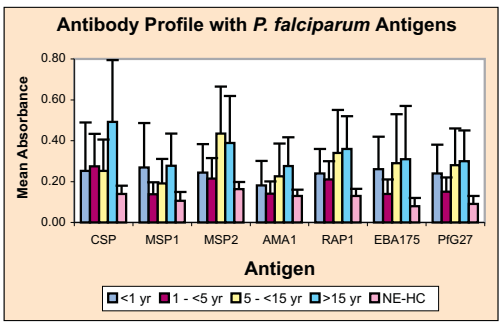
Figure 2.4.6: Malaria prevalence by age groups at civil hospital, Maihar

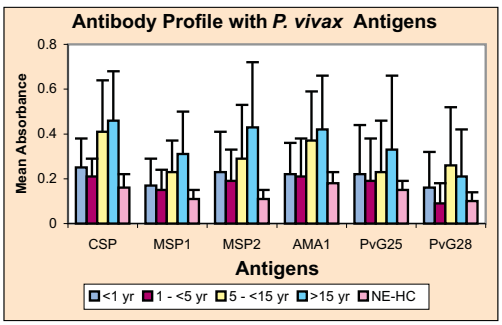


(B) Immunology

Determination of antibodies: Antimalarial antibody responses, developed in the course of natural infection were measured by ELISA and quantified using known antimalarial antibody positive controls in terms of O.D. values against13 (7 Pf and 6 Pv) vaccine candidate antigens (Peptide). Seropositivity rate was significantly higher in older children (5-<15 year) and adult subjects than younger children (1-<5 yr). Overall young children showed low antibody responses against most of the antigens. The adults who developed naturally acquired immunity to both types of malaria had high antibody levels to CSP, MSP2 and AMA1. Seroprevalence in the pregnant women were also found high in the CSP and MSP2 peptide.The antimalarial IgG profile in mothers at the time of delivery was low and same response has been observed in respective infants (Fig. 2.4.7).

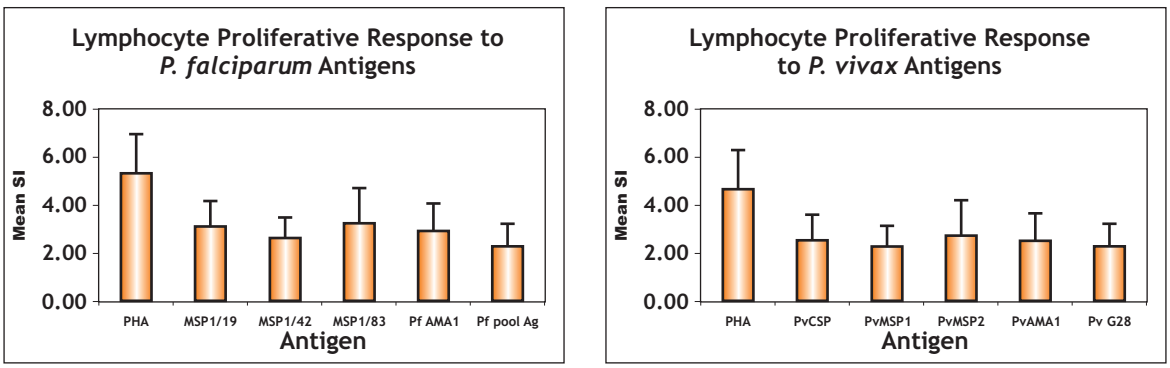
Fig. 2.4.7: Antibody profile with P.*falciparum* and P.*vivax* antigens





Lymphocyte proliferation assay: Lymphocyte transformation assay were done in a subset of samples. The proliferative responses against *P. falciparum* and *P. vivax* antigens (5 each) were determined in individual set of PBMCs. Five-day culture supernatants from individual lymphocyte samples were assayed by sandwich ELISA for IL-4 and IFN-ã using anti-human IL-4 and IFN-ã antibodies (Fig. 2.4.8).

Fig. 2.4.8: Lymphocyte proliferative response to P.*falciparum* and P.*vivax* antigens



Cytokines estimation: Cytokines (IL-4, IL-10, IP-10, IFN-ã and TNF-á) levels were estimated in plasma using commercially developed two-site ELISA assay in the patients plasma of uncomplicated *P falciparum* malaria (UFM), cerebral malaria (CM), severe malaria anemia (SMA), severe malaria (SM) cases with other complications and healthy controls (HC). Results revealed that IP-10, which is a proinflammatory chemokine, progressively increased with the disease severity. The levels of TNF-á and IFN-ã (both proinflammatory) were also increased with the severity of disease. Anti-inflammatory cytokine IL-4 began rising in plasma during acute falciparum malaria and increased maximum among CM cases but in SM and SMA, IL-4 level was comparatively lower than CM.

(C) Molecular Biology

Genomic DNA Extraction and Polymerase chain reaction (PCR), Nucleotide Sequencing and Sequence analysis: The genetic polymorphism in the vaccine candidate antigen genes (MSP1, MSP2, MSP3, TRAP, RAP1, CSP, EBA-175 & AMA1) and drug resistance genes (*pfcrt*, *pfdhfr* and *pfdhps*) were studied (Table 2.4.4 & 2.4.5). Genomic

DNA was extracted from *P. falciparum* infected blood. The aliquot of extracted DNA was used to amplify the vaccine candidate antigen genes and drug resistance genes using the respective gene specific primers. Sequencing was performed using ABI Big Dye Terminator Ready Reaction Kit Version 3.1 on a 310 genetic analyzer (Applied Biosystems). Sequences were analyzed using BioEdit software and aligned by using GeneDoc.

Table 2.4.4: Details of sequenced isolates for vaccine candidate antigens

Antigens	No. of Isolates	Sequenced Nucleotides(bp)	Results
MSP-1	85	555	K1- 40 %, MAD 20- 40% & RO 33- 20%
MSP-2	81	634	FC 27- 63% & 3D7- 37%
MSP-3	32	550	K1- 44%, FC 27- 34% & 3D7- 22%
TRAP	67	757	G3- 46% & (G8- G23)- 54%
RAP-1	47	1133	GIII- 36%, GII- 23% & Rest (GI- GXI)- 41%
EBA-175 (REGION II)	31	1100	GIII- 38%, GVIII- 23% & Rest (GI- GX)- 39%
CSP	30	1000 plus 450	Th2R GI- 83% & Rest (GII- GV)- 17% Th3R GI- 87% & Rest (GII- GIV)- 13%
AMA-1	90	540	GI- 33%, GIII- 20% & Rest (GII- GXI)- 47%

Table 2.4.5: Details of sequenced isolates for drug resistance loci

Drug resistance loci	No. of Isolates	Sequenced Nucleotides(bp)	Codons	Results
Pfdhps	96	653	436, 437, 540, 581 & 613	Wild- 92% Single Mutant- 8%
Pfdhfr	93	542	16, 51, 59, 108 & 164	Wild- 4% Single Mutant-11% Double mutant- 47% Triple Mutant- 38%
Pfcrt	78	582 plus 232	72-76 & 220	Wild- 2% Single Mutant- 98%

(D) Entomological study

Entomological surveillance

Indoor resting mosquito collections: Monthly collections of indoor resting anophelines were initiated from August 2006 in 10 study villages. Out of those, 5 are located in plain area, 3 in forest area and 2 near dam site. Results of one year study revealed that the average per man hour density (MHD) of *Anopheles* mosquitoes was 42.59 (Range-16.0 in June to 195.05 in August). Of which 66.8 % were *Anopheles culicifacies* (MHD-28.49, Range- 12.5 in May to 126.4 in August). The density of *An.fluviatilis* was recorded 0.48. Of which, the density in the forested villages was 0.97 wich is significantly higher as compared to that in villages located in plain area and near dam site ($F=9.23$; $P<0.001$). While, *An. culicifacies* and total anophelines density was highest in the villages surrounded by dam reservoir and lowest in forested villages, although this difference is not significant statistically ($P>0.05$).

Determination of sporozoite rate: The sporozoite determination by ELISA was done after obtaining Monoclonals from CDC and standardization of the techniques. The proportion of *An.culicifacies* and *An.fluviatilis* with positive salivary glands by ELISA is shown in table 2.4.4. A total of 376 *An.culicifacies* and 95 *An.fluviatilis* collected from different localities were assayed for sporozoite ELISA technique of which 4 *An.culicifacies* were found positive for the presence of sporozoites (1 for Pf and 3 for Pv strain). None of the *An.fluviatilis* was sporozoite positive. Overall sporozoite rate of *An.culicifacies* was 1.06 of which 1.12 in plain area and 1.42 in forest area.

Table 2.4.4: Results of sporozoite ELISA test

Type of village	No. of *An.culicifacies* tested	Results of ELISA test	No. of *An.fluviatilis* tested	Results of ELISA test
Plain villages	**178**	**2 +ve (Pv) Sporozoite rate-1.12**	**57**	**nil**
Villages in forest area	**140**	**2 +ve(1Pf,1Pv) Sporozoite rate-1.42**	**37**	**nil**
Villages near dam site	**58**	**nil**	**1**	**nil**
Total	**376**	**4 +ve (1Pf,3Pv) Sporozoite rate-1.06**	**95**	**All -ve**

3. OTHER COMMUNICABLE DISEASES

3.1 Prevalence of pulmonary tuberculosis in tribal population of Madhya Pradesh

Epidemiological information on tuberculosis is vital for planning the control strategies particularly in tribal areas. Hence, a cross-sectional survey, in collaboration with Tuberculosis Research Centre (TRC), Chennai, is undertaken in a randomly selected tribal population of Madhya Pradesh to estimate (i) the prevalence of pulmonary tuberculosis (ii) tuberculosis infection in tribal population and (iii) the drug susceptibility pattern of *tubercle bacilli*.

Tuberculin survey to estimate the prevalence of infection and thereby compute the Annual Risk of Tuberculosis Infection (ARTI) among children aged 1-9 years has been completed. The survey methodology involved enumeration of the study population, BCG scar reading and tuberculin testing & reading. Of the 5333 children registered, 4802 (90%) were tuberculin tested and read for reaction size. Among these, 3062 (64%) children had no BCG scar. The prevalence of infection among unvaccinated children was estimated as 6.8% (95% CI: 4.8 8.9%) and ARTI was computed to be 1.3% (95% CI: 0.9-1.7%). The corresponding figures for children irrespective of scar status were 7.1% (95% CI: 5.5 8.8%) and 1.3% (95% CI: 1.0-1.7%) respectively. The difference in the proportion of infected children without and with BCG scar was not statistically significant. There was no difference in risk of infection between male and female children. The prevalence of infection and ARTI were significantly higher among children aged 5-9 years compared to those aged 1-4 years (P<0.001).

Tuberculin survey was also carried out among children of Saharia a primitive tribe of Madhya Pradesh. A total of 1341 children aged 1-9 years were tuberculin tested and read for reaction size. Among these, 877(65.4%) children had no BCG scar. The prevalence of infection among unvaccinated children was estimated as 21.1% (95% CI: 18.3 - 23.8%). The ARTI was computed as 3.9% (95% CI: 3.4 - 4.5%). The corresponding figures for children irrespective of scar status were 20.4% (95% CI: 18.2 22.5 %) and 3.9% (95% CI: 3.5 - 4.3%) respectively. The findings show a rising trend of tuberculosis infection and ARTI compared to the findings of the earlier study conducted in this primitive tribal community fifteen years ago.

The disease survey is in progress. The survey methodology for disease survey includes registration of all individuals in the random sample and screening of those aged 15 years or more for identification of symptomatic. Two sputum samples, one spot and one over night, are being collected from all symptomatic and those with a history of previous anti-TB treatment and brought to the laboratory for smear, culture and drug susceptibility testing. So far, four out of eleven selected districts have been surveyed.

In Katni district 1287 tribal persons were asked for the symptoms of pulmonary tuberculosis using standard methodology and 217 individuals were found to be chest symptomatic. Of these, 201 individuals provided sputum specimen for examination. Seven individuals were found positive for tuberculosis by smear as well as culture. All the seven strains were *Mycobacterium tuberculosis* and susceptible to anti-tuberculous drugs namely Isoniazid, Rifampicin, Streptomycin and Ethambutol.



Processing of specimen in laboratory

3.2 Epidemiology of viral hepatitis in primitive tribal populations of Orissa, Madhya Pradesh/Chhattisgarh and Jharkhand

A total of 843 blood samples were collected from Bharia, Saharia, Baiga, Abujhmaria and Kamar tribes. The prevalence of HBsAg and Anti HBs in the tribal population varied from 3.1% to 6% and 4.6% to 27.1% respectively. The prevalence of Hepatitis C virus was highest among Bharia tribe followed by Saharia tribe. It was observed that about 90% individuals of the study population were exposed to Hepatitis A virus.

The study is in progress.

Table 3.2.1: Seroprevalence of viral hepatitis among the primitive tribes Of Madhya Pradesh and Chhattisgarh

Tribe	Population	HBsAg No. positive/No. tested	Anti HBs No. positive/No. tested	Anti HCV No. positive/No. tested	Anti HAV No. positive/No. tested
Abujmaria	66	-	3/19	-	62/66
Baiga	57	2/33	0/25	-	2/2
Saharia	188	9/188	51/188	4/188	162/188
Kamar	258	8/258	12/258	2/258	243/258
Bharia	274	12/274	20/274	45/274	216/274



Blood sample collection

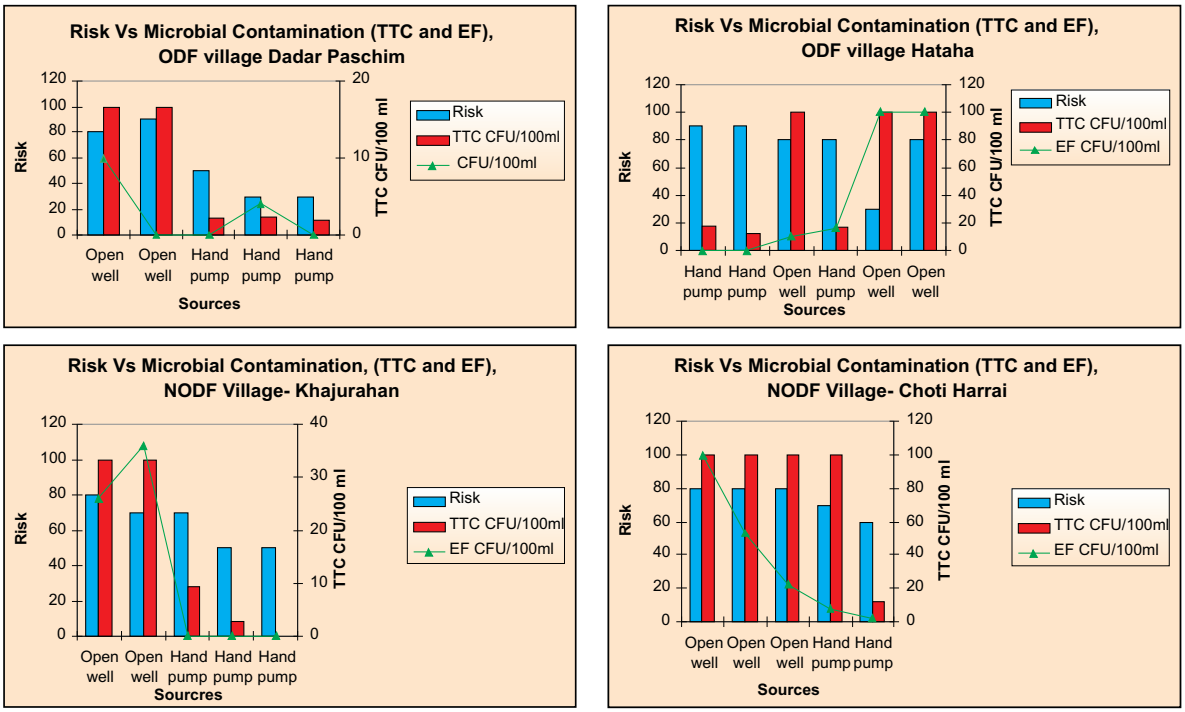
3.3 Quantitative microbial risk based approaches to evaluate open defecation free and non open defecation free villages of Rewa district, Madhya Pradesh

One of the millennium development goals is to achieve 50% improvement in the sanitation coverage by 2015. Government of India launched the *Total Sanitation Campaign* (TSC) with the primary aim of increasing coverage of sanitation facilities for rural areas in 2003. To reinforce the TSC, a monetary award termed *Nirmal Gram Puraskar (NGP)* was launched in 2005. In many states, including Madhya Pradesh (MP), this was reinforced with a state award for Open Defecation Free village (ODF) status (with the same criteria as NGP). To assess the risk factors and health impact of the MP state awarded ODF award scheme, a cross sectional study was undertaken in the Rewa district of central Indian state of Madhya Pradesh in 2006.

Results from the study indicate that both diarrhoeal morbidity and overall worm infestations from stool samples were reduced in ODF villages as compared to NODF. The sanitary condition of water sources in ODF and NODF villages were almost same. The effect of poor sanitary conditions near water sources and their impact on water quality due to dispersion of microbes were estimated by measuring the depth of water level. For low depth water sources, microbial contamination was found to be more as compared to relatively high depth water sources. However, open wells were found to be more contaminated as compare to bore wells with hand pumps having similar depth which is due to poor sanitary condition around the open wells (Fig. 3.3.1).

The disease burden due to microbial contamination in water sources in open defecation free and non open defecation free villages was calculated using the Quantitative Microbial Risk Assessment (QMRA) technique outlined in the World Health Organisation (WHO) *Guidelines for drinking Water quality 3rd edition*. Outlined below is an analysis of the Disability Adjusted Life Years (DALYS) that have been derived from the QMRA.

Fig. 3.3.1: Risk of microbial contamination in ODF and NODF villages



The study shows that despite improved sanitary conditions in ODF villages, a high *Disability Adjusted Life Year* (DALY) score (165) for thermotolerant coliforms as compared to low score (73) in NODF villages is matter of concern (Table 3.3.1).

Table 3.3.1: Disease burden in ODF and NODF villages

Villages		Disease Burden Per Population (DB): DALYs/Year					
		TTC			EF		
		Hand Pumps	Open Well	Mean Value	Hand Pumps	Open Well	Mean Value
Open Defecation Free Villages	Dadar Paschim	321	147	234	137	31	84
	Hataha	45	147	96	26	129	78
		MEAN		165			81
Non Open defecation free Villages	Khajurahan	29	0	14	0	86	43
	Choti Harrai	118	146	132	31	12	22
		MEAN		73			32

4. SOCIAL AND BEHAVIOUAL STUDIES

4.1 Study of population growth and health status among Kamars: A primitive tribe in Raipur district of Chhattisgarh

The study was carried out among Kamar tribe to know the vital statistics and health morbidity in Gariaband, Mainpur, Chhura and Nagari blocks. A cross sectional descriptive survey with probability proportion to size sampling method was applied. The total populations 4521 of 1026 households were surveyed in 48 villages. Average household size was 4.4 persons ranges 1-15 and sex ratio 1059 female per 1000 males estimated. Most of the population lived in nuclear family (71.8%). The age sex structure of the population is shown in Fig. 4.1.1. The children in age group 0-14 account for 41.8% of the total population. In contradiction to general sex ratio, males out number females by 2.6% in this age group. Dependency ratio is estimated to be 76.5 %.

Waterborne diseases including diarrhea and dysentery are prevalent in these tribal areas. It has been found that 6.9% of household use drinking water from stream/river. About 57.2% pregnant women had taken antenatal care and about 73.3% children were immunized. The population growth rate (natural growth) was 1.82% people per year. The crude birth rate and crude death rate were 30.1 and 11.1 respectively. It is further estimated that 2.8 children were ever born per woman and infant mortality rate is 98 per/1000 live birth.

About 76% of women were found to be illiterate. Most of the deliveries (97.7%) were made at home. Further 52.3% of the deliveries were assisted by untrained personnel. Eleven hundred one individuals were clinically examined to assess the health status. About 55% adult individuals were suffering with chronic energy deficiency as reflected by body mass index (Table 4.2.1). About 32.0% individuals were suffering with various clinical conditions and diseases. Acute respiratory infections 12.0%, arthritis 3.8%, fever 1.8%, bitots spot 5.1%, diarrhea 0.5%, leprosy 0.5%, pulmonary tuberculosis 0.4% etc. were found in the study population.

Fig 4.1.1: Population pyramid

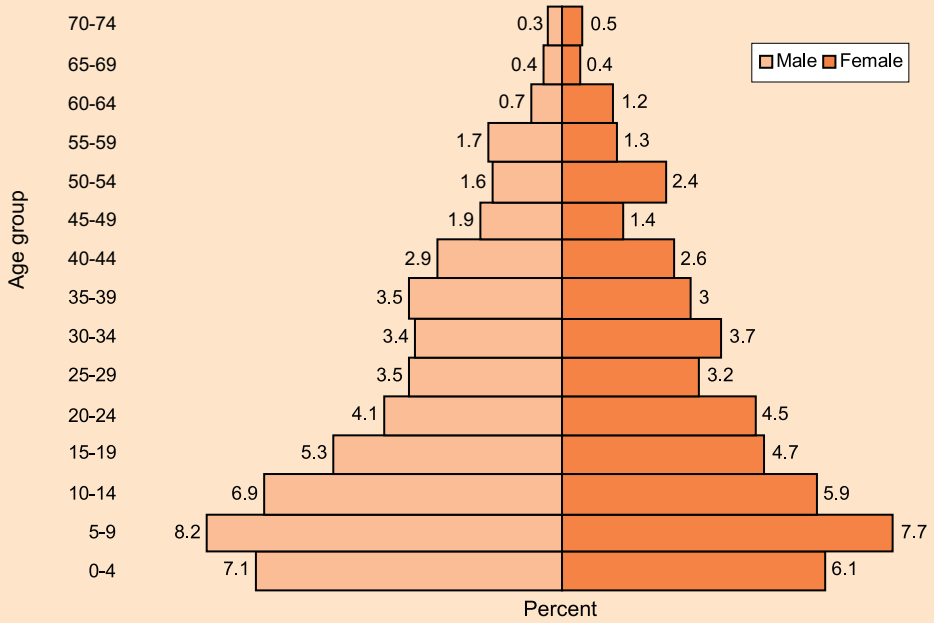


Table 4.1.1: Body mass index

Gender	BMI Grade($18Year)			
	Grade-III	Grade-II	Grade-I	Normal
	<16	16.0-16.9	17.0-18.4	18.5
Male (306)	5.9	14.4	28.7	51.0
Female (260)	15	20	26.5	38.5
Total (566)	10.1	17.0	27.7	45.2

5. NEW INITIATIVES

The new initiatives include some approved projects which have been recently initiated or going to start soon.

5.1 Molecular epidemiology of community acquired Methicillin resistant Staphylococcus aureus strains from primitive tribes of Madhya Pradesh and Chattisgarh

The prevalence of staphylococcus aureus and its antibiotic resistance remains unknown for tribal areas. The present study is designed with the objectives to estimate the prevalence of Community Acquired Methicillin Resistant *Staphylococcus aureus* (MRSA) from primitive tribes of Madhya Pradesh and Chattisgarh and also to carry out genotyping of these strains by various methods.

Nasal swabs would be collected from healthy individuals of the primitive tribes of both the states. Standard microbiological techniques would be used to isolate and identify *S.aureus*. Antimicrobial susceptibility tests would be done to determine the susceptibility of *S.aureus* to various antibiotics. Genotyping of MRSA would be done by Multilocus sequence typing (MLST) and staphylococcus protein A typing. The study would provide a baseline data for prevalence of *S. aureus* and MRSA in primitive tribes of these states.

A pilot study was done in Baigachak area of Madhya Pradesh. Nasal swabs were collected from the individuals of Baiga tribe. *Staphylococcus aureus* was isolated from 21 of the 35 swabs. Antimicrobial susceptibility testing was done by Kirby Bauer disc diffusion method using 4ug methicillin discs. Methicillin resistance was detected in 10 strains; however minimum inhibitory concentration is yet to be detected.

5.2 Integrated disease surveillance for non communicable diseases: Non communicable disease risk factors Surveillance

The study is to be launched nationally and initial training of trainers has been completed. This center will act as one of the regional centre. The assigned job is training, technical supervision, quality control and monitoring of the state of Madhya Pradesh and Maharashtra in the first phase.

A total of 5000 sampled households are to be covered. The survey work is likely to begin in September 2007. As a quality control measures 50% households are to be surveyed by the regional centre.

5.3 HIV positive individuals to understand their action taken for non-progression of HIV infection to live longer and healthy

The study aims to understand the level of knowledge and awareness of people living with HIV to prolong their asymptomatic period. After understanding their knowledge, need based periodic counseling shall be given and thereafter impact of counseling will be assessed. It has been planned to study 50 HIV positive individuals screened either at RMRCT or NSCB Medical College, Jabalpur. Seven HIV positive individuals have been studied so far. Counseling would be given for 3 - 4 times with an interval of 3-5 weeks. Follow up counseling is being done at RMRCT.

5.4 The study of Prevalence of HIV and TB among the Jail inmates in Jabalpur

The study aims at screening the jail inmate's for HIV and tuberculosis. Central jail of Jabalpur inhabits approximately 2600 - 2800 inmates at one time. A questionnaire was developed to assess the knowledge of inmates for HIV and tuberculosis. Questionnaires were filled by 1350 inmates. Analysis for the same is in progress. IEC is given to the inmates and those who volunteer for HIV testing are registered. Pre and Post test counseling would be provided as per NACO guidelines. Till now, 380 samples have been collected and the analysis is in progress.

5.5 Tobacco related disease in the tribal population of Kundam block, Jabalpur district

Tobacco use is worldwide. The dried leaf of the plant *Nicotiana tobaccum* is used for smoking, chewing or snuff. Globally tobacco use accounts for a considerable proportion of mortality. Tobacco contains more than 4,000 chemicals and most of them are carcinogenic. Chewing or snuffing tobacco can lead to inflammation of oral cavity and oral cancer. Incidence of smoking related disease and concomitant rise in death rates have increased rapidly in many developing countries. Tobacco is responsible for significant amount of morbidity and mortality among middle age adults. As per WHO,

tobacco kills more people annually than AIDS, alcoholics, drug abuse and accidents. It is estimated that the figure is expected to rise to million deaths per year by 2030. Main objective of the study is to find the prevalence of tobacco addiction/use in Gond population in Kundam block of Jabalpur district.

Pre-testing and finalization of the questionnaire is in progress.

5.6 Prevalence of infertility in India

According to the estimates of World Health Organization, there are about 8 % of couples at global level experience some form of infertility problems during their reproductive lives. The consequences of infertility for women particularly in pronatalist culture can be devastating. A large number of such couples suffers from infertility largely from preventable conditions such as STI, parasitic infestations, unhygienic obstetric practices, unsafe abortions, exposure to potently toxic substances in the diet or environment and different socio-cultural practices. Community based data on prevalence of infertility has seen scarce in India and most such data is hospital based. The present study aims at understanding prevalence, risk factors, treatment seeking behaviour and psycho-social consequences. The data will be generated by canvassing a interview schedule among 2700 ever married women in the age group 15-44 years in rural and urban areas in each of the states under study. Selection of study area in state and finalization of the interview schedule is in progress.

5.7 Understanding tribal sexuality behaviour and vulnerability to RTI, STD, HIV/AIDS with special focus on adolescent group

Compared to other population groups, tribal communities by and large were more liberal to sex. Today, coupled with livelihood compulsion (poverty), of tribal expanded network of communication (road and rail links) and transport, industrialization and mining activities, temporary population migration to the work site all have contributed to tribal and non-tribal contacts, opportunities for indulgence in sex, sexual exploitation of tribal female workers, thereby increasing the chances of risk of STD and HIV/AIDS infections. Adolescents are quite vulnerable to such infections. In the present study attempts will be made to understand the knowledge, attitude, behaviour and practices about various reproductive and sexual matters among tribal adolescents in the context of emerging prevalence of these diseases. The study will be conducted among the Santhal

(Jharkhand), Munda (West Bengal), Orao (Orissa) and Gonds (Madhya Pradesh) by canvassing an interview schedule. The designing of survey schedules and completing other essential formalities are in progress.

5.8 Establishment of hospital based surveillance of Rotavirus diseases and strains

RMRCT has been set as a new centre for the multicentric study entitled "Establishment of hospital based surveillance of Rotavirus diseases and strains". The study involves ICMR headquarter and ICMR institutes namely National Institute of Virology, Pune and National Institute of Epidemiology, Chennai. Stool specimens are being collected from children (up to 5 years age) hospitalized at NSCB Medical College Hospital and Victoria Hospital, Jabalpur. So far, 96 samples have been collected. The samples are sent on regular basis to National Institute of Virology, Pune for its analysis.

6. REGULAR ACTIVITIES

6.1 Sickle cell clinic at NSCB Medical College

Centre offers the facilities for diagnosis of haemoglobinopathies to the patients of Medical College, Jabalpur and other public sector hospitals of the area. During the year, a total of 579 persons suspected to be suffering from hemolytic anaemia were analysed for haemoglobinopathies. Sickle cell disease was diagnosed in 97 persons. Sickle cell trait was identified in 116, -thalassaemia trait in 27, -thalassaemia major in 4, HbE trait in 3 and HbE- -thalassemia in 2 persons. These patients and their parents were briefed about presentation and possible prognosis of disorders and preventive measures. The sickle cell disease patients were advised to get them registered in the sickle cell clinic.



Sickle cell clinic

6.2 Integrated counseling and testing centre

During the period 1st April 2006 to 31st March 2007, 857 individuals were tested for HIV of which 95 (11.08%) tested positive. Pretest and post test counseling was provided to 585 and 437 individuals respectively. ICTC also organize IEC activities for high risk groups. This year two IEC camps for truck drivers and 8 camps for prisoners were organized to impart awareness about HIV/ AIDS.



HIV/AIDS counseling

Sentinel surveillance

RMRCT participated in the Sentinel Surveillance program of NACO from 1st September to 15th December 2006. Blood samples from fifteen ANC sites, three STD sites and one FSW site were tested for HIV infection. In all 7856 specimens were tested and overall positivity was 0.35% in ANC and 1.3% in STD clinic attendees.

External quality assurance scheme

External Quality Assurance Program (EQAS) is functional at RMRCT since 2003. The centre has been recognized as State Level Referral Laboratory for this purpose. The centre also conducted a training programme for blood bank officers, ICTC In-charge and laboratory technicians under the EQAS.

6.3 National nutrition monitoring bureau

National nutrition monitoring bureau (NNMB) Madhya Pradesh unit is functioning from this institute since 1987 covering both Madhya Pradesh and Chhattisgarh. In the year 2006-07 "Assessment of Diet & Nutritional Status of the Tribal Population-Second Repeat Survey" has been planned by the central team at NIN, Hyderabad. Apart from collection of current dietary information, anthropometric assessment of the tribal population, it has also been planned to assess the prevalence of different morbidity, obesity and hypertension among adult male and females above 20 years.

A total of 4800 household from 120 villages were selected to be covered from Madhya Pradesh and Chhattisgarh for all activities except dietary survey. The calculated sample size for the dietary survey was 1200 households. Till date 74 (62%) villages have been covered and the data has been sent to NIN central laboratory for analysis.

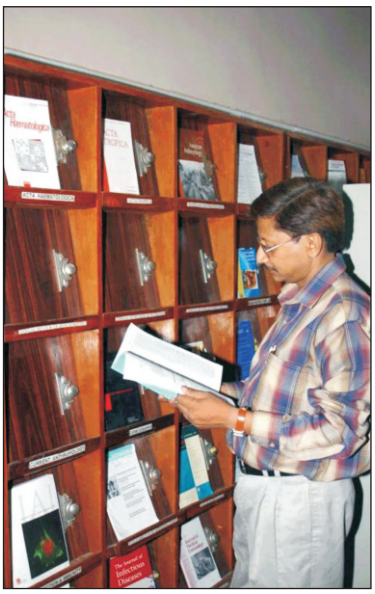
6.4 Library

The library of RMRCT continues to cater the documentation and information needs of the scientists and other research staff of RMRCT as well as other institutes like Veterinary College, Medical College, Home Science College, Rani Durgawati Vishwavidyalaya etc. It is also playing a key role in the area of reference activities by providing resources such as J-Gate, JCCC@ICMR, MEDLINE search and other online retrieval activities using the LAN network. Library is now providing the LAN facility to scientists and other research staff of the centre through Broadband connection for literature search for their research work. The library has also procured the library software, LIBSYS.

693 journals subscribed by all ICMR institutes/centres can be accessed through JCCC@ICMR. The library is providing other facilities such as photocopying, resource sharing etc.

The library has following resources:

New additions	
Books/Journals	20
Total subscription	54
Total Library Collections	
Books	1099
WHO Publications	526
Bound Journals (Foreign)	937
Bound Journals (Indian)	662
MEDLINE CDs	21
Other CDs	20
Census Floppies	60



6.5 Human resource development

Project work of students

The Centre provides technical guidance and infrastructure facilities to MD / MSc students to conduct their project work for dissertations. This year, 8 students from different institutes were enrolled.

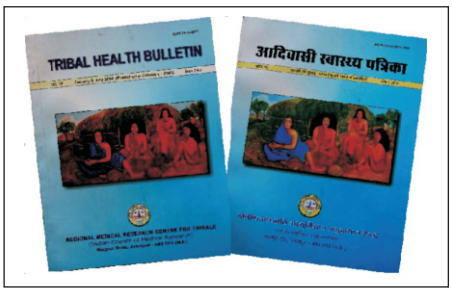
Seminar/Journal club

Seminars, journal club meetings are regularly held at the centre. Scientists as well as research staff actively participate in these activities.

6.6 RMRCT publication

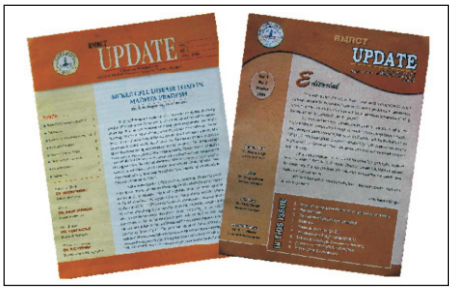
Tribal Health Bulletin

Tribal health bulletin is biannually published from the centre. Bulletin contains original articles related to tribal health.



RMRCT Update

The Centre also publishes RMRCT Update biannually highlighting activities of the center.



7. PUBLICATIONS

1. Abbad A., Roy J., Saha K.B., (2006). Maternal and child health care: Experience from Bharia tribe of Patalkot valley of Madhya Pradesh. Journal of Family Welfare. 52(1):1- 6.

2. Agrawal M.C., **Rao V.G.**, Vohra S., Bhondeley M.K., Ukey M.J., Anvikar A.R., Yadav R. (2006). Is active human schistosomiasis present in India? Current Science, 92 (1):19-25.

3. Agrawal M.C., **Rao V.G.**, Vohra S., Singh B.K., Gupta S., Singh K.P., Bhondeley M., Uike M., Anvikar A. (2006). Cercarien Hullen reaction for the assessment of human schistosomiasis in India. Journal of Parasitic Diseases, 30, 181-83.

4. Alam M.T., Bora H., Bharti P.K., Saifi M.A., Das M.K., Dev V., Kumar A., **Singh N.**, Dash A.P., Das B., Wajihullah, Sharma Y.D. (2006). Similar trends of pyrimethamine resistance-associated mutations in *Plasmodium vivax* and *P. falciparum*. Antimicrobial Agents and Chemotherapy. 51(3): 857-63.

5. Anvikar A.R., Dolla C.K., Dutta S., Rao V.G., Gadge V., Shukla G.P., Rao S., Karforma C. Role of Diarrheagenic *Escherichia coli* in acute diarrhoea of tribal preschool children of central India. Paediatric and Perinatal Epidemiology (Accepted).

6. Baqui A.H., Williams E.K., Darmstadt G.I., Kumar V., Kiran T.U., Panwar D., **Sharma R.K.**, Ahmed S., Sreevasta V., Ahuja R., Santosham M., Black R.E. (2007). Newborn care in rural Uttar Pradesh. Indian Journal of Pediatrics, 74 (3): 241-247.

7. Bharti P.K., Nagpal A.C., **Singh N.** (2006). Efficacy of chloroquine chemoprophylaxis for *Plasmodium falciparum* in Dindori district, Madhya Pradesh. Indian Journal of Medical Microbiology. 24(2):148-9.

8. Chakma T., Meshram P., Rao V., Singh S.B., Kavishwar A. Nutritional status of Baiga - A primitive tribe of Madhya Pradesh. Journal of Human Ecology (Accepted).

9. Das D. (2007). Prospects of filariasis elimination programme in India. Current Science. Vol. 92 (1):10 January.

10. Das. D., Dash A.P. (2006). Elimination of lymphatic filariasis: Adoption of appropriate strategy. Tribal Health Bulletin. Vol. 10 (1 & 2): 38-41.

11. Gyan chand, Soan V., Dash A.P. (2006). Breeding preferences of Dengue vector *Aedes aegypti* in Jabalpur city, in special issue of the proceedings of the National Academy of Sciences India, Section B (Biological Sciences).

12. Jain D.C., Mishra R.C., Tiwary R.S. (2006). An Anthropological study among Hill Korwas, Chhattisgarh (in Hindi). Madhya Bharti. 57: 83-85.

13. Kumar D., Joshi N., Roy J., Jain D.C. (2006). Continuity of infertility among Khairwar tribe: A test of multivariate hypothesis. Man in India. 85 (3&4):231-237.

14. Kumar D., Verma A., Sehgal V.K., Dolla C.K., Singh T.B. (2006). Effect of sex and survival of infants on fertility in a primitive tribe of Chhattisgarh: A factorial analysis. Indian Journal of Preventive and Social Medicine. 37(1&2):37-42.

15. Mittra P., Vinayak S., Chandawat H., Das M.K**., Singh N.**, Biswas S., Dev V., Kumar A., Ansari M.A., Sharma Y.D. (2006). Progressive increase in point mutations associated with chloroquine resistance in *Plasmodium falciparum* isolates from India. Journal of Infectious Diseases. 193 (9): 1304-12.

16. Prajapati S.K., Verma A., Adak T., Yadav R.S., Kumar A., Eapen A., Das M.K., **Singh N.**, Sharma S.K., Rizvi M.A., Dash A.P., Joshi H. (2006). Allelic dimorphism of *Plasmodium vivax* gam-1 in the Indian subcontinent. Malaria Journal. 24 (5): 90.

17. Rao V.G., Anvikar A.R., Savargaonkar Deepali, Kumar Dinesh (2007). Is syndromic approach appropriate for managing STIs? Current Science. 93(1), 9-10.

18. Rao V.G., Dash A.P., Agrawal M.C., Yadav R.S., Anvikar A.R., Vohra S., Bhondeley M.K., Ukey M.J., Das S.K., Minocha R.K., Tiwari B.K (2007). Cercarial dermatitis in central India: An emerging health problem among tribal communities. Annals of Tropical Medicine & Parasitology.101(5): 409-13.

19. Rao V.G., Sugunan A.P., Murhekar M.V., Sehgal S.C. (2006). Malnutrition and high childhood mortality among Onges - A primitive tribe of A and N islands. Public Health Nutrition. 9(1): 19-25.

20. Saha K.B., Jain D.C., Saha U. (2006). Unfolding contraceptive technology: where Indian population stands today? Journal of Human Ecology (in press).

21. Saha K.B., Saha U. (2006). Concern for post-natal care services-usually or lesser-value service in rural areas (A study among the primitive Lodha tribe of West Bengal). Tribal Health Bulletin. Vol. 10 (1 & 2): 23-29.

22. Saha K.B., Verma A. (2006). High fertility among scheduled tribes of Madhya Pradesh: A concern. Indian Journal of Medical Research. 123, Jan. 2006: 89-90.

23. Sharma R.K. (2007). Population growth and agriculture change in India since independence in `Fifty years of Indian Agriculture', edited by Mohammad A., Munir A., Siddiqui S.H. and Rehman H. New Delhi: Concept Publication Company.

24. Singh N., Chand S.K., Mishra A.K., Bharti P.K., Singh M.P., Ahluwalia T.P., Dash A.P. (2006). Epidemiology of malaria in an area of low transmission in central India. American Journal of Tropical Medicine and Hygiene. 75(5): 812-6.

25. Singh N., Shukla M.M., Mishra A.K., Singh M.P., Paliwal J.C., Dash A.P. (2006). Malaria control using indoor residual spraying and larvivorous fish: a case study in Betul, central India. Tropical Medicine and International Health.11 (10):1512-20.

26. Tiwari B.K., Rao V.G., Mishra D.K., Thakur C. S. S. Infant feeding practices among Kol tribal community of Madhya Pradesh. Ind J Comm Med. (Accepted).

8. CONFERENCES/ WORKSHOPS/ MEETINGS/ TRAININGS ATTENDED

DR. NEERU SINGH

- Participated in Kalyani 'A live phone in programme on Malaria' telecasted from Bhopal Doordarshan on 10th August 2006.
- Presented a paper on 'Tribal Malaria: An update on changing epidemiology' at National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.
- Attended an International meeting on Dengue at National Institute of Virology, Pune on 10th November 2006.
- Attended a meeting regarding Vaccine project at ICMR, New Delhi during 15th - 17th November 2006.
- Attended a meeting on technical committee regarding equipments at ICMR, New Delhi during 10th -13th December 2006.
- Attended a meeting regarding MIP Project at NIMR FS, Ranchi on 20th and 21st December 2006.
- Attended Director's meeting at DMRC, Jodhpur during 23rd - 26th December 2006.
- Attended a workshop on Malaria and delivered a lecture on 'Malaria in Pregnancy' at Bhubneshwar during 12th -14th February 2007.
- Attended 8th Sir Dorabji Tata Symposium on “Arthropod Borne Viral Infections” and chaired the session 'Viruses and vectors' at National Institute of Advanced Studies, Bangalore on 10th and11th March 2007.

Dr. V. G. Rao

- Presented a poster on 'Reproductive tract infections in tribal women of central India' at National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.

DR. TAPAS CHAKMA

- Presented a paper on 'Iron supplementation reduces anemia and improves performance among adolescent tribal girls in central India' at 55th Annual Epidemic Intelligence Service conference held at Atlanta, USA during 24th - 28th April 2006.
- Attended state level workshop on Fluorosis Mitigation as a resource person organized by UNICEF, Ranchi and Dept. of PHED, Government of Jharkhand on 9th and 10th August 2006.
- Presented a paper on 'Health and nutrition status of tribals of Madhya Pradesh and Chhattisgarh' at National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.
- Attended as a resource person in an International Learning Exchange Programme organized by UNICEF on 14th and 15th November 2006 at Dhar and Jhabua, M.P.

DR. R. B. GUPTA

- Presented a paper 'Sickle cell disease in central India-need for micro level planning' at National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.
- Attended conference on biosocial aspects of human growth nutrition and development at Chandigarh on 20th and 21st November 2006.
- Attended conference on “Problems of Health and Nutrition among Tribals - its Cause and Remedies” at Jagdalpur, Chhattisgarh during 8th - 10th February 2007.

DR. S. R. QAMRA

- Attended workshop on HIV/ AIDS, Prevention, Care and Support Programme at Banglore on 9th and 10th November 2006.
- Presented a paper on 'Growth profile of Baiga children of M.P.' in conference on Biosocial aspects of Human Growth Nutrition and Development at Chandigarh on 20th and 21st November 2006.
- Attended workshop on Integrated Tribal Development Project at Bhopal on 11th December 2006.

- Attended as a resource person in Evaluation of HIV/AIDS Work and Assessment of HIV/AIDS Programmes at Jhabua and Mandsaur during 12th - 16th December 2006.
- Attended conference on "Problems of Health and Nutrition among Tribals - Its Cause and Remedies" at Jagdalpur, Chhattisgarh during 8th -10th February 2007.
- Received training on "Community Health and Development Trainers" from 17th July - 26th August 2006.

DR. ANUP ANVIKAR

- Attended the state level stakeholders meeting on reduction of childhood mortality organized by UNICEF at Bhopal on 9th October 2006.
- Presented a paper at National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.
- Presented a paper on 'Role of Diarrhoeagenic Escherichia coli in acute diarrhoea of tribal preschool children of central India' at the Joint International Tropical Medicine meeting 2006 and 6th Asia Pacific Travel Health Conference held at Bangkok, Thailand during 29th November to 1st December 2006.
- Attended a meeting on identification of priority areas and development of biotechnology based projects and programmes under networking arrangement at MP Council of Science and Technology, Bhopal on 11th December 2006.
- Attended a review meeting on HIV Sentinel Surveillance at NARI, Pune on 20th December 2006.

MR. GYANCHAND

- Attended International Symposium on Vector and Vector Borne Diseases and presented a paper on 'Nocturnal activity of Anopheles culicifacies in Dindori District of M.P.' at CRME, Madurai during 13th - 15th October 2006.
- Presented a poster on 'Vector siblings species composition and malaria transmission in tribal areas of M.P.' at National Symposium on Tribal Health, RMRCT, Jabalpur on 19th and 20th October 2006.

DR. NEELIMA MISHRA

- Attended training programme on Biomedical Information Retrieval at NIC, New Delhi during 18th - 21st July 2006.
- Presented a poster on 'Nutritive value of silkworm pupae of Assam, India' at National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.

DR. KALYAN. B. SAHA

- Presented a poster on 'Men's involvement in reproductive health: A study among the Khairwar tribe of central India' at National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.
- Attended a workshop on Ethics in Social Science Research in Health at Rewari, Haryana organized by ICMR, Delhi and NIH, USA during 27th November to 1st December 2006.
- Presented a paper at "Bhopal Seminar" (Contemporary Issues and Reproductive Health), Bhopal during 17th - 19th January 2007.
- Attended conference on "Problems of Health and Nutrition among Tribals - its Cause and Remedies" at Jagdalpur, Chhattisgarh during 8th - 10th February 2007.
- Attended & Presented paper in the conference on "Recent Advances and Challenges in Reproductive Health Research", New Delhi, during 19th - 21st February 2007.
- Attended & Presented paper in the international conference of Population Association of America (PAA), at New York City, USA during 29th - 31st March 2007.

DR. DASARTHI DAS

- Presented a poster on 'The need for Albendazole incorporation in mass drug administration programme for Filariasis elimination in M.P.' at National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.

DR. C. K. DOLLA

- Attended advanced training programme on Biomedical Information Retrieval at NIC, New Delhi on 21st June 2006.

- Presented a paper on 'Malariometric indices in Kodaku tribe of central India' at XI International Congress of Parasitologists conference at Glasgow, Scotland during 6th -11th August 2006.

DR. SURENDRA KUMAR

- Attended advanced training programme on Biomedical Information Retrieval at NIC, New Delhi on 21st June 2006.
- Presented a poster on 'Fluoride levels in drinking water sources in six villages of Sonbhadra district, Uttar Pradesh, India' at 11th World Congress on Public Health and 8th Brazilian Congress on Collective Health at Rio De Janeiro, Brazil during 21st - 25th August 2006.
- Presented a poster on 'Hydrocele estimation a parameter for filariasis prevalance' at National Symposium on Tribal Health held at RMRCT, Jabapur on 19th and 20th October 2006.

MR. DINESH KUMAR

- Presented a paper on 'Socioeconomic and delivery practices inequalities of infant health among primitive tribe in central India' at 11th World Congress on Public Health and 8th Brazilian Congress on Collective Health at Rio De Janeiro, Brazil during 21st - 25th August 2006.
- Presented a poster on 'Demographic and socioeconomic correlates of Infant health in primitive tribe of Chhattisgarh' at National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.
- Presented a paper on 'Infants health research in tribes of central India: The parental consent' at 6th FERCAP (Forum for Ethical Review Committees in Asia and the Western Pacific) International Conference at Bangkok, Thailand on 19th and 20th November 2006.

DR. RAJIV YADAV

- Presented a paper on 'Malaria endemicity in Pando tribe, Chhattisgarh state, India' at XI International Congress of Parasitologists Conference at Glasgow, Scotland during 6th - 11th August 2006.

- Presented a poster on 'Morbidity profile of sickle cell disease in central India' at National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.

DR. JYOTHI BHAT

- Attended training programme on Biomedical Information Retrieval at NIC, New Delhi during 18th - 21st July 2006.
- Participated in a program on World AIDS Day and delivered a lecture on HIV/AIDS on 1st December 2006 at Central Jail, Jabalpur.
- Attended a meeting organized by Measles NetIndia for 'Review of Measles Surveillance in India' at National Institute of Virology, Pune on 11th and 12th December 2006.
- Delivered a lecture on 'Biosafety in microbiology laboratory' in training programme for Blood Bank Officers and Technicians of VCTC centres under EQAS held on 2nd and 3rd February 2007 at RMRCT, Jabalpur.
- Attended training on External Quality Assurance Scheme (EQAS) on HIV as faculty at Jabalpur on 2nd and 3rd February 2007.
- Attended training programme on 'Real time PCR' at Labindia, Gurgaon during 14th - 16th February 2007.
- Attended VIII Sir Dorabji Tata symposium on 'Emerging Viral Infections' at SDTC, Bangalore on 10th and 11th March 2007.

DR. RAVENDRA K. SHARMA

- Presented a paper on 'Utilization of health services and RCH status in M.P.: A district level analysis' and a poster on 'Birth interval and Child Survival in Rural Uttar Pradesh, India' at National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.
- Presented a paper at “Bhopal Seminar” (Contemporary Issues and Reproductive Health), Bhopal during 17th - 19th January 2007.

MR. V. SOAN

- Presented a poster on 'Knowledge attitude and practice towards Malaria in rural community of Baiga Chak area, Dindori District (M.P.)' at National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.

Dr. D. C. Jain

- Presented a poster on 'Family planning use and its determinants among tribes of M.P.: A case study of Gonds of Jabalpur district' in National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.
- Presented a paper at "Bhopal Seminar" (Contemporary Issues and Reproductive Health), Bhopal during 17th - 19th January 2007.

DR. J. ROY

- Attended training programme on Biomedical Information Retrieval at NIC, New Delhi during 18th - 21st July 2006.
- Presented a poster on 'Food consumption pattern and associated habits of the Bhil tribe of Dhar districts of M.P.' at National Symposium on Tribal Health held at RMRCT, Jabapur on 19th and 20th October 2006.

MR. ARVIND KAVISHWAR

- Attended advanced training programme on Biomedical Information Retrieval at NIC, New Delhi on 21th June 2006.
- Presented a poster at National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.
- Attended a workshop on Statistics in Clinical Research at National Institute of Pharmaceutical Education and Research, Mohali, Punjab during 27th - 29th October 2006.

DR. ARVIND VERMA

- Attended training programme on Biomedical Information Retrieval at NIC, New Delhi duirng18th to 21st July 2006.

- Presented a poster on 'RCH practices in a primitive tribe: Barrier to achieve MDG' at National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.
- Presented a paper on 'Fertility and mortality in primitive tribe of central India' at 24th ISMS Conference, PSG Institute of Medical Sciences and Research, Coimbatore during 1st - 3rd December 2006.

DR. B. K. TIWARI

- Presented a poster on 'Infant feeding practices among Kol tribal community of M.P.' at National Symposium on Tribal Health held at RMRCT, Jabapur on 19th and 20th October 2006.

MR. S. B. SINGH

- Attended advanced training programme on Biomedical Information Retrieval at NIC, New Delhi on 21st June 2006.
- Presented a poster on 'Fluoride toxicity: Role of nutrition in endemic area of Mandla district, M.P.' at National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.

MR. VIJAY GADGE

- Attended training program on Hepatitis viruses at National Institute of Virology, Pune during 28th August - 1st September 2006.
- Presented a poster at National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.

MR. M. P. S. S. SINGH

- Presented posters on 'Prevalence of Sickle Haemoglobin and Thalassaemia among Scheduled Caste and Scheduled Tribe groups of Khandwa District of M.P.' and 'Prevalence of Common Haemoglobinopathies among Schedule Caste and Scheduled Tribes of Shahdol District of M.P.' at National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.

MR. PRAVAL SRIVASTAVA

- Presented a poster on 'Physical growth of children of M.P.' at National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.

MR. AJAY GOEL

- Presented a poster on 'Urban-Rural differential in population characteristics of tribal districts of M.P.' at National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.
- Presented a paper on 'Delivery practices among Kamar tribe of Chhattisgarh' at 24th ISMS Conference, PSG Institute of Medical Sciences and Research, Coimbatore during 1st - 3rd December 2006.

MR. P.K. MESHRAM

- Presented a poster on 'Growth progression and nutritional status among Baiga tribal children (10-17 years) of M.P.' at National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.

Dr. N. K. CHOUDHARI

- Presented posters on 'Assessment of Iodine deficiency disorders in Baiga Chak area of district Dindori' and 'Impact of counseling on knowledge, attitude and practice of sickle cell anaemia' at National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.

DR. M. K. BHONDELEY

- Presented a poster on 'Cercarial dermatitis in central India: An emerging health problem among tribes' at National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.

MR. SUBHASH GODBOLE

- Presented a poster on 'High prevalence of sickle haemoglobin in Mehra caste of district Betul, M.P.' at National Symposium on Tribal Health held at RMRCT, Jabalpur on 19th and 20th October 2006.

MR. S. N. SINGH

- Attended advanced training programme on Biomedical Information Retrieval at NIC, New Delhi on 21st June 2006.
- Presented a paper on 'Impact of information technology on LIS environment' at 2nd All India Conference of CGLA, Indira Gandhi National Forest Academy, Dehradun during 29th - 31st October 2006.
- Presented a poster on 'A case study on teaching of MEDLARS indexing system' at National Conference on Innovation in Indian Science, Engineering and Technology at Swadeshi Science Movement of India, IARI Pusa Delhi on 26th November 2006.

9. EVENTS

9.1 National science week celebration

As a part of national science week celebration (28th February to 5th March 2007), posters were exhibited to show the scientific achievements of the centre.



Scientific exhibition

9.2 Foundation day

The centre celebrated its foundation day on 1st March 2007. Prof. A. P. Dash, Director, National Institute of Malaria Research, New Delhi presided over the function and Dr. Geeta Vanage, Deputy Director, National Institute for Research in Reproductive Health, Mumbai delivered lecture as chief guest. Some cultural programmes were also performed by staff and their family members on the occasion of foundation day.



Dr. Neeru Singh welcomes guests



Cultural programme in progress

9.3 Scientific advisory committee meeting

Nineteenth scientific advisory committee meeting was held on 3rd August 2006 at the RMRCT under the chairmanship of Lt. Gen. Raghunath, Principal Executive, Sir Doraji Tata Centre for Research in Tropical Disease, Bangalore.



SAC meeting in progress

9.4 National technology day

On national technology day (11th May 2006) celebration, Dr. S.P. Gautam, Head of the Dept. of Bioscience and Ex-vice chancellor, Rani Durgavati University, Jabalpur delivered a scientific lecture focusing on Micro Array and Nano Technology.



Dr. Neeru Singh welcomes guests on national technology day

9.5 Hindi fortnight celebrations

Hindi fortnight was observed by the Centre during 1st to 15th September 2006. An appeal was made by the Officer-in-Charge to all officers and staff of the Centre to do their official work as much as possible in Hindi. Some Hindi competitions were also organized for the employees. Dr. V.G.Rao, Dy. Director distributed cash prizes and certificates to the winners of the competitions on behalf of the Officer-in-Charge.



Prize distribution ceremony on the occasion of *Hindi* day

9.6 Inauguration of auditorium

Prof. N. K. Ganguly, Director General, ICMR inaugurated new auditorium of the Centre on 19th August 2006.



Prof. N. K. Ganguly cutting the ribbon

9.7 Vigilance week (1st to 7th November 2006)

National vigilance week was observed during 1st to 7th November 2006. An oath was taken by all employees of the centre not to indulge in corrupt practices.



Staff taking oath on vigilance day

9.8 World AIDS day (1st December 2006)

On World AIDS day a team of RMRCT participated in an activity organized at Central Jail, Jabalpur for educating the Jail inmates about HIV/AIDS. The team included Dr. S. R. Qamra, Dr. Jyothi Bhat, Mrs. Canina Luke, Mr. Atul Karkare, Ms. Shraddha Shrivastav and Mr. Krishnakant Verma. Team also participated in various activities as a part of World AIDS day and visited nearby villages for educating people about HIV/AIDS.

10. APPENDICES

10.1 Symposium/Workshops/Trainings/Meetings Organized

WHO sponsored workshops on "Rapid Assessment of Burden of Malaria in Pregnancy in Madhya Pradesh" were organized for Doctors and Other Health Staffs on 20th June 2006 at Jabalpur, 5th September 2006 at Satna and on 15th December 2006 at Bhopal.



National symposium on tribal health was organized on 19th and 20th October 2006 at RMRCT Jabalpur. National and international scientists and eminent laureates of various fields addressed the symposium.



Five malariology training workshops for Medical Officers of various districts of Madhya Pradesh were organized in the month of October and November 2006.



Two workshops were organized jointly by NIMR (FS) Jabalpur and Directorate of Health Services, Bhopal under EMCP for the Professors of Medical College Jabalpur, Scientists of NIMR and State Health Officers, in the month of November 2006 and January 2007 at NIMR, FS, Jabalpur.



Dr. V. G. Rao has organized a meeting with a team of scientists from Tuberculosis Research Centre (ICMR), Chennai on 8th June 2006 in connection with a collaborative project on prevalence of tuberculosis among tribal population of Madhya Pradesh.



10.2 Felicitation/Awards/Scholarship

Bio-diversity award

Centre received best Bio-diversity award in Jabalpur Commissionerate. Dr. Neeru Singh received the award from the Commissionar, Jabalpur.



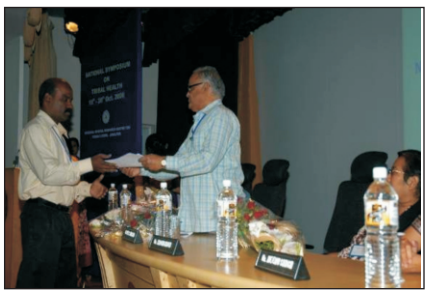
Dr. R. K. Sharma, Research Officer

Received 'Young Scientist Award' for third best oral presentation at National Symposium on Tribal Health.



Mr. M.P.S.S. Singh, Research Assistant

Received 'Young Scientist Award' for second best poster at National Symposium on Tribal Health.



Mrs. P.L. Pande, Assistant Director

Prof. N. K. Ganguly, Director General, ICMR felicitated Mrs. P.L. Pande for 25 years of her services to the centre on 30th December 2006.



Dr. C. K. Dolla, Senior Research Officer

Received Burasay Award from Bill-Melinda Gates Foundation to attend international conference on 'XI International Congress of Parasitologists Conference' at Glasgow, Scotland.

Mr. Dinesh Kumar, Senior Research Officer

Received international scholarship from WHO-TDR to attend the 'Sixth FERCAP (Forum for Ethical Review Committees in Asia and Western Pacific) International Conference' at Bangkok, Thailand.

Dr. K. B. Saha, Senior Research Officer

Received ICMR travel award for scientists to attend Population Association of America (PAA) 2007 meeting at New York, USA.

10.3 Visits

Prof. N. K. Ganguly, Director General, ICMR, New Delhi visited center on 30th December 2006.



Hon'ble Health Minister, Sh. Ajay Vishnoi, Govt. of Madhya Pradesh visited the center on 25th January 2007 and discussed various scientific activities with the scientists of the center.



Mr. Mohindra Singh, Sr. DDG, ICMR visited center on 27th January 2007 to attend the building committee meeting.



Lt. Gen. D. Raghunath, Principal Executive, Sir Dorabji Tata Centre for Research in Tropical Diseases, Bangalore visited center to review and discuss the ongoing projects with scientists of the centre on 31st January 2006.



10.4 Farewell

Mrs. P. L. Pandey, Assistant Director, of the centre attained superannuation on 31st January 2007.



Mr. Doman Ram, Security Guard of the centre attained superannuation on 28th February 2007.



10.5 COMMITTEES

Scientific Advisory Committee

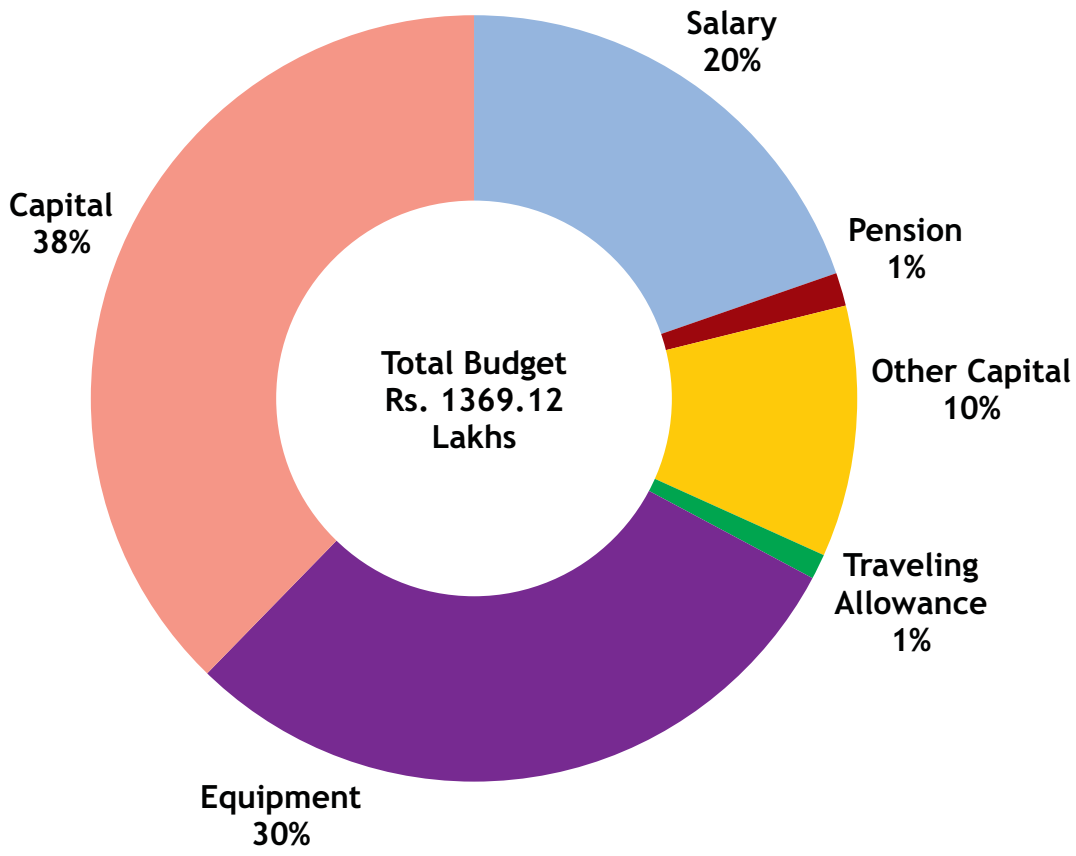
1	Lt. Gen. Raghunath Principal Executive Sir Dorabji Tata Centre for Research in Tropical Diseases, IISC Campus, Bangalore	Chairman
2	Prof. R.C. Mahajan S.N. Bose INSA Research Professor & Emeritus Professor Department of Parasitology PGI, Chandigarh	Member
3	Dr. P.R. Narayanan Director Tuberculosis Research Centre Chetput, Spur Tank Road, Chennai	Member
4	Dr. D.S. Agrawal B-24, Swasthya Vihar New Delhi	Member
5	Dr. S. Pattanayak B-91, Swasthya Vihar, Vikas Marg, New Delhi	Member
6	Prof. A.P. Dash Director National Institute of Malaria Research Shamnath Marg, Delhi	Member
7	Dr. Dipali Mukherjee DDG (SG) & Chief Division of ECD Indian Council of Medical Research Ansari Nagar, New Delhi	Member
8	Dr. Neeru Singh Officer-in-charge Regional Medical Research Centre for Tribals Nagpur Road, Jabalpur	Member Secretary

Ethics Committee

1	Hon'ble Justice M.V. Tamaskar Retd. Justice M.P. High Court, Jabalpur	Chairman*
2	Dr. Arun Sharma Professor & Head Department of Radiology NSCB Medical College, Jabalpur	Chairman **
3	Dr. Pushpa Kirar Professor & Head Department of Radiotherapy NSCB Medical College, Jabalpur	Member
4	Dr. S. P. Pandey Professor & Head Department of Pharmacology NSCB Medical College, Jabalpur	Member
5	Dr. S. S. Sandhu Associate Professor Department of Biological Sciences Rani Durgavati University, Jabalpur	Member
6	Dr. B. K. Sahu Professor & Head Department of Rural Development Rani Durgavati University, Jabalpur	Member
7	Sh. Jamal Akhtar Baig Director ENFORCE (NGO Representative) M.P. Nagar, Bhopal	Member
8	Dr. V. G. Rao Deputy Director RMRCT, Jabalpur	Member Secretary

* Resigned from the chairmanship on Sept. 2006; ** Chairman of the committee since Sept. 2006

10.6 Budget


Salary
20%
Pension
1%
Other Capital
10%
Traveling
Allowance
1%
Equipment
30%
Capital
38%
Total Budget
Rs. 1369.12
Lakhs

10.7 Staff List

Officer-in-charge*

Dr. Neeru Singh, PhD

Community Medicine Department

Dr. V. G. Rao, MD	Deputy Director
Dr. Chandra K. Dolla, MBBS	Senior Research Officer
Dr. Surender Kumar, MBBS	Senior Research Officer
Dr. Bal Krishna Tiwari, PhD	Research Assistant
Dr. Manoj K. Bhondeley, PhD	Research Assistant
Shri Ajay K. Goyal, MA	Research Assistant
Shri Mahendra K. Ukey, DMLT	Lab Technician
Shri Ajesh Kumar Dubey	Insect Collector
Shri M. P. Tiwary, MA	Insect Collector
Shri Rakesh K. Jaiswal	Insect Collector
Shri Rajendra P. Gond	Lab. Servant
Shri Sukhlal Vishwakarma	Lab. Servant

Epidemiology Department

Dr. Tapas Chakma, MBBS, MAE	Deputy Director
Shri P. Vinay Rao, MSc	Research Assistant
Shri Samar Bahadur Singh, MA, LLB	Research Assistant
Shri Pradeep K. Meshram, MPhil	Research Assistant

Genetics Department

Dr. R. B. Gupta, PhD	Assistant Director
Dr. Rajiv Yadav, MD	Research Officer
Shri M.P.S.S. Singh, MSc	Research Assistant
Smt. Ujjwala Das, MSc	Research Assistant
Shri Subhash Godbole, MSc	Lab. Technician
Shri Ashok K. Gupta, BA, CMLT	Lab. Technician
Shri C. P. Vishwakarma, BA	Lab. Technician
Shri Anil Gwal, BSc, CMLT	Lab. Technician
Shri D. K. Mishra, BA	Insect Collector
Shri Jagdish P. Thakur	Lab. Servant

* From 5th May 2006

Vector Control Department

Shri Gyan chand, MSc	Senior Research Officer
Shri V. Soan, MSc	Technical Officer
Shri Mohan Lal Patel	Lab. Technician
Shri S. R. Mishra	Insect Collector
Shri B. S. Patel	Insect Collector
Shri Ghanshyam Ahirwar	Insect Collector
Shri D. C. Khatarkar	Insect Collector
Shri Dhan Singh Thakur	Lab. Assistant
Shri Santosh K. Haldkar	Lab. Servant*

Microbiology Department

Dr. Anup Anvikar, MD	Assistant Director
Dr. Jyothi Bhat, MD	Research Officer
Shri Vijay S. Gadge, MSc, DMLT	Research Assistant
Shri G. P. Shukla, BSc	Tech. Assistant
Smt. Savinder Rao, BSc, CMLT	Tech. Assistant
Shri Chandan Karforma, BSc, DMLT	Tech. Assistant
Shri Raghunadh Babu, MSc, DCP	Data Entry Operator, Gr. B**
Smt. Canina Luke	Lab. Technician
Shri Purshottam Patel, CMLT	Lab. Technician
Shri Suresh K. Burman	Lab. Servant
Shri Jagdish Singh	Lab. Assistant

Immunology Department

Dr. Dasarathi Das, PhD	Senior Research Officer
Shri Sujit K. Das, BSc, DMLT	Lab. Technician***
Shri Lalit K. Sahare, DMLT	Lab. Technician
Shri Sheikh Salim	Lab. Attendant

Biochemistry Department

Smt. P. L. Pande, MSc	Assistant Director$
Dr. Neelima Mishra, PhD	Senior Research Officer$$
Dr. N. K. Choudhary, PhD	Health Educator
Shri L. S. Kaushal, BSc, CMLT	Lab. Technician
Shri Rajju Lal Neelkar	Lab. Assistant
Shri Vijay K. Kachhi, MA	Lab. Assistant

* Joined on 9.02.07; ** Transferred to NIN, Hyderabad on 12 May 2006; *** On deputation at IICS, Kolkatta;
$ Retired on 31 Jan. 2007; $$ Transferred to NIMR, Delhi on 13 Nov. 2006.

Demography Department

Dr. Kalyan B. Saha, PhD	Senior Research Officer
Dr. D. C. Jain, PhD	Research Assistant
Dr. Alpana Abbad, PhD	Research Assistant
Smt. Maya Pandey, MA	Research Assistant
Shri Shiv Kumar Singh, MA	Lab. Technician

Statistics Department

Shri Dinesh Kumar, MSc	Senior Research Officer
Shri Bhagirath Lal, MSc	Research Officer*
Dr. Arvind Verma, PhD	Research Assistant

Health Economics

Dr. Ravendra K. Sharma, MPhil, PhD	Research Officer**
Shri P. K. Srivastava, MA, LLB	Upper Division Clerk

Medico Social Department

Dr. S. R. Qamra, PhD	Assistant Director
Shri Arvind Kavishwar, MSc, PGDCA	Research Assistant
Shri Praval Srivastava, MA	Research Assistant
Shri Prakash Srivastava, BA	Data Entry Operator Gr. B
Shri Vinay K. Balmik	Lab. Servant***

Publication Department

Dr. Joytrimoy Roy, PhD	Research Assistant

Library

Shri K.V.K. Rao, MCom, BLib	Asst. Lib. & Inf. Officer
Shri S.N. Singh, MA, BLib	Library Information Asst.
Shri Ganga Bahadur	Jr. Library Attendant

Art and Photography Section

Dr. R.C. Mishra, PhD	Sr. Artist cum Photographer

National Nutrition Monitoring Bureau (M.P. Unit)

Dr. Rakesh Babu, MBBS	ARS
Mrs. S. J. Khan, MHSc	ARS
Shri Gajanan Dhore, MSW	Social Worker

Voluntary Counseling & Testing Centre

Shri Atul Karkare, MA	Counselor
Ms. Sharddha Shrivastava, MA	Counselor
Shri K. K. Verma, BSc, PGDCP&DT	Lab. Technician

* Transferred to NIMR, Delhi on 21 Aug. 2006; ** Joined on 5 Apr. 2006; *** Joined on 6 Feb. 2007.

Establishment Section

Shri C. A. Thomas, BSc, LLB	Administrative Officer
Shri Ravi K. Gupta, BA	Section Officer*
Shri Sudesh K. Yadaw, MA, LLB	Personal Assistant
Shri Subhash C. Muduali, MA, BLib	Stenographer
Shri Rajendra K. Thakur, BSc	Assistant
Shri Hakim Singh Thakur, MA	Jr. Hindi Translator
Shri Rajendra K. Minocha, DMLT	Tech. Assistant
Shri Jagdish P. Mishra, MA	Field Assistant
Shri Bhagwani Prasad	Upper Division Clerk
Shri Raj Kumar Handa, BCom-I	Upper Division Clerk
Shri Raghubir Prasad	Upper Division Clerk
Shri Subash S. Kumbhare, BSc, Com. Opt.	Data Entry Operator Gr. B
Shri Promod Kumar Garg	Daftari
Shri Laxman Prasad	Daftari
Shri Madan Singh Maravi	Peon
Shri Preetam Lal Gond	Peon
Shri Baidraj Kachhi	Mali
Shri Ramesh Kumar Ahirwar	Head Watchman
Shri Suresh Jaiswal	Watchman cum Cook
Shri Umesh Gautam, BCom	Watchman cum Cook
Shri Anil Vinodia	Watchman cum Cook
Shri Doman Ram	Watchman**
Shri Malikhan Singh	Watchman
Shri Santosh Sonkar	Watchman
Shri Ajay K. Soni	Watchman
Shri Santosh K. Kol	Watchman
Shri Prem Singh Gond	Watchman
Shri Bhagwan Singh	Watchman
Shri Ram K. Mehra	Watchman
Shri Summat Singh	Watchman
Shri Munna Lal Choudhary	Watchman
Shri Shesh Narayan	Sweeper
Shri Arakh C. Malik	Sweeper
Shri Vishnu Prasad	Sweeper
Shri Sone Lal Dumar	Sweeper
Shri Papu Lal Dumar	Sweeper

* On deputation at IGNCA, New Delhi; **Retired on 28 Feb. 2007

Accounts Section

Shri B. K. Majumdar, BCom	Accounts Officer
Shri Mohan Lal Kori, MA	Research Assistant
Shri P. K. Argal, MA	Assistant
Shri P. K. Bhale Rao, MCom	Assistant
Shri D. P. Lodhi, MA, LLB	Assistant
Shri Baisakhu Lal	Lower Division Clerk
Shri Suresh K. Pareha	Peon

Stores Section

Shri Gyan Chand Jain, BA	Section Officer
Shri S. K. Vinodia, BCom	Assistant
Smt. Filomina Lakra, BA	Upper Division Clerk
Shri Sailesh K. Sahai	Upper Division Clerk
Shri N. L. Sharma	Upper Division Clerk*
Smt. Pushpa Umate, MA	Upper Division Clerk
Smt. Reena Shome, BSc	Lab Recorder
Shri Ram K. Verma	Wireman
Shri Ram N. Dubey	Lower Division Clerk
Shri Tulsi Ram Kurmi	Driver
Shri Ram Narayan	Driver
Shri Ashok Kumar Saini	Driver
Shri Paramjeet Singh	Driver
Shri Ramesh Kumar Gond	Driver
Shri Genda Lal	Driver
Shri Ravindra Kumar Katrah	Driver
Shri P. K. Namdev, MA	Motor Mechanic
Shri K. Venugopal Rao	Store Attendant
Shri Promod Choubey, MA, Dip. T	Lab Attendant
Shri Rameshwar Prasad	Workshop Helper cum Driver
Shri Prakash Sangle	Lab. Servant**
Smt. Shashi Prabha Mishra	Lab. Servant**
Shri Shamshad Ali Ansari	Lab. Servant**

* Retired on 31 Aug. 2006; ** Joined on 28 Sept. 2006

10.8 राजभाषा नीति के कार्यान्वयन एवं अनुपालन से संबंधित प्रगति रिपोर्ट

क्षेत्रीय जनजाति आयुर्विज्ञान अनुसंधान केन्द्र (भा0आ0अ0प0), जबलपुर में भारत सरकार, गृह मंत्रालय, राजभाषा विभाग की राजभाषा नीति के समुचित कार्यान्वयन एवं अनुपालन के लिए सतत् प्रयास किए जा रहे हैं।

1. राजभाषा नीति कार्यान्वयन समिति

राजभाषा विभाग के आदेशानुसार इस अनुसंधान केन्द्र में 'राजभाषा कार्यान्वयन समिति' गठित है:–

1. डॉ.नीरू सिंह, प्रभारी अधिकारी	–	अध्यक्ष
2. डॉ. व्ही0 जी0 राव, उप–निदेशक	–	सदस्य
3. श्री सी0 ए0 थॉमस, प्रशासन अधिकारी	–	सदस्य
4. श्री बरुण कुमार मजूमदार, लेखा अधिकारी	–	सदस्य
5. श्री ज्ञान चंद जैन, अनुभाग अधिकारी (भण्डार)	–	सदस्य
6. श्री हाकिम सिंह ठाकुर, कनिष्ठ हिंदी अनुवादक	–	सदस्य

हर तीन माह में इस समिति की बैठक होती है, जिसमें इस अनुसंधान केन्द्र में राजभाषा कार्यान्वयन एवं अनुपालन की स्थिति की समीक्षा की जाती है तथा सरकार द्वारा निर्धारित लक्ष्यों को प्राप्त करने हेतु आवश्यक उपायों की संस्तुति की जाती है। अभी तक इस समिति की 58 तिमाही बैठकें हो चुकी हैं, पिछली तिमाही बैठक दिनांक 26/06/2007 को सम्पन्न हुई।

2. हिंदी पत्राचार

इस केन्द्र द्वारा प्रतिवेदनाधीन वर्ष 2006 के दौरान सरकार द्वारा निर्धारित लक्ष्य के अनुरूप हिंदी पत्राचार में शत–प्रतिशत लक्ष्य प्राप्ति बनाए रखी है। 'ग' क्षेत्र में अंग्रेजी में पत्र भेजने पर यथानिर्देश उसका हिंदी रूपांतर साथ में भेजने के निर्देश दिए गए हैं।

3. धारा 3(3) एवं राजभाषा नियम–5 का अनुपालन

राजभाषा अधिनियम, 1963 (यथासंशोधित 1967) की धारा 3(3) के अनुपालन में सामान्य आदेश, परिपत्र, निविदा सूचना एव निविदा प्रपत्र तथा रिक्त पदों के विज्ञापन आदि द्विभाषी रूप में जारी किए जाते हैं। वर्ष 2006 के दौरान कुल 15 सामान्य–आदेश, परिपत्र द्विभाषी रूप में जारी किए गए।

राजभाषा नियम – 5 के अनुसार हिंदी में प्राप्त पत्रों, आवेदनों एवं अभ्यावेदनों के उत्तर हिंदी में ही दिए जाते हैं।

4. प्रशिक्षण

इस केन्द्र के अधिकतर अधिकारियों एवं कर्मचारियों को हिंदी का कार्यसाधक ज्ञान/प्रवीणता प्राप्त है और यह केन्द्र राजभाषा नियम 10.4 के अंतर्गत अधिसूचित है। राजभाषा विभाग के निर्देशों के अनुसार जिन कर्मचारियों को हिंदी टंकण एवं आशुलिपि के प्रशिक्षण की आवश्यकता थी , उन सभी को हिंदी शिक्षण योजना, राजभाषा विभाग, जबलपुर कार्यालय से हिंदी/ हिंदी टंकण/ हिंदी आशुलिपि का सेवाकालीन प्रशिक्षण दिलाया गया है और इस मद में भी शत–प्रतिशत लक्ष्य प्राप्त कर लिया गया है।

5. हिंदी दिवस / हिंदी पखवाड़ा

राजभाषा विभाग के निदेशों के अनुसार केन्द्र में प्रति–वर्ष हिंदी दिवस एवं हिंदी पखवाड़ा मनाया जाता है। इस दौरान निदेशक / प्रभारी अधिकारी की ओर से सभी अधिकारियों एवं कर्मचारियों से सरकारी कामकाज अधिकाधिक हिंदी में करने की अपील की जाती है, कर्मचारियों के लिए हिंदी प्रतियोगिताएं आयोजित की जाती हैं।

प्रतिवेदनाधीन वर्ष के दौरान इस केन्द्र में 1–15 सितंबर,2006 तक हिंदी पखवाड़ा मनाया गया। इस दौरान हिंदी टंकण, हिंदी टिप्पण एवं प्रारूपण तथा तात्कालिक हिंदी निबंध लेखन की प्रतियोगिताएं आयोजित की गईं। दिनांक 14 सितंबर, 2006 को 'हिंदी दिवस' के अवसर पर केन्द्र के डॉ. व्ही0 जी0 राव, उप–निदेशक ने इन हिंदी प्रतियोगिताओं के विजेता कर्मचारियों को नकद पुरस्कार एवं प्रमाण–पत्र वितरित किए। कुल 10 नकद पुरस्कार प्रदान किए गए। इस वर्ष हिंदी टंकण मे तीन पुरस्कार (श्री शैलेश कुमार सहाय, श्रीमती फिलोमिना लकड़ा, श्री सतीश कुमार विनोदिया) हिंदी टिप्पण एवं प्रारूपण मे चाार पुरस्कार (श्री सतीश कुमार विनोदिया, श्री रामनरेश दुब, श्री शैलेश कुमार सहाय, श्री सुबाष चंद मुदुलि) व तात्कालिक हिंदी निबंध लेखन मे तीन पुरस्कार (श्री सुभाष गोडबोले, श्री सतीश कुमार विनोदिया, श्री शिव कुमार सिंह) को प्रदान किए गए।

6. मूल रूप से हिंदी में सरकारी कामकाज करने के लिए प्रोत्साहन योजना (वर्ष 2005–06)

भारतीय आयुर्विज्ञान अनुसंधान परिषद के महानिदेशक प्रोफेसर निर्मल कुमार गांगुली ने दिनांक 30–12–2006 को आयोजित एक कार्यक्रम में प्रोत्साहन स्वरूप इस केन्द के श्री भगवानी प्रसाद, व श्री राजकुमार हांडा को प्रथम नकद पुरस्कार तथा श्री के0 वेनुगोपाल राव व श्री रामनरेश दुबे को द्वितीय नकद पुरस्कार प्रदान किए।



श्री राजकुमार हांडा प्रो० गांगुली से पुरस्कार प्राप्त करते हुये

7. प्रकाशन

इस अनुसंधान केन्द्र से जनजातियों की विशिष्ट स्वास्थ्य समस्याओं के अध्ययन एवं अनुसंधान के बारे में एक स्वास्थ्य पत्रिका का प्रकाशन हिंदी एवं अंग्रेजी में एक साथ किया जाता है। अँग्रेजी में यह ''ट्राइबल हैल्थ बुलेटिन'' के नाम से तथा हिंदी में ''आदिवासी स्वास्थ्य पत्रिका'' के नाम से प्रकाशित की जाती है। वर्ष 2006 में इस पत्रिका के खण्ड–10, अंक–1 एवं 2 का प्रकाशन किया गया है।



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