

4. IDVC Research Activities

Highlights of Research Activities Under “Integrated Disease Vector Control” Project

Nadiad (Gujarat)

A study on the health impact assessment of the Sardar Sarovar Narmada Water Resources Development Project on communicable diseases with particular emphasis on mosquito-borne diseases was initiated. A project for development of integrated control strategy for malaria and dengue was initiated in selected talukas of northern Gujarat. Evaluation of deltamethrin 25% WG and bifenthrin 10% WP for malaria vector control was done. Evaluation of larvivorous fish programme under NVBDCP was undertaken. Support in technical, training, health education, epidemic investigation and containment was provided to antimalaria programme.

Jabalpur (Madhya Pradesh)

Malaria epidemic investigation was carried out in Betul district on the request of the state health department and followed-up. Impact of DDT indoor residual spraying was evaluated. Situation analysis was done in Mandla, Dindori, Sagar and Damoh districts on the request of the NVBDCP. A study on the placental malaria was done. Tolerability and efficacy of artesunate plus chloroquine or sulphadoxine-pyrimethamine combination vs single agent chloroquine or sulphadoxine-pyrimethamine in the treatment of uncomplicated falciparum malaria was studied. A study on integrated control of malaria in Sagar district was initiated. Insecticides status of malaria vectors was evaluated in eight districts. Entomological evaluation of Olyset nets impregnated with permethrin 2% w/w was also undertaken. Technical support was provided to the local health department in training and IEC activities.

Rourkela (Orissa)

Longitudinal epidemiological studies were continued in forest and plain areas characterised by hyper- and meso-endemic malaria situations respectively to prepare a site for malaria vaccine trial. A work was initiated on the study of genetic diversity of *P. falciparum* and *P. vivax* and development of microsatellite markers. Evaluation of bio-efficacy, persistence and impact of mosquito nets treated with deltamethrin tablet formulation on malaria transmission was done. Evaluation of bio-efficacy on Olyset nets impregnated with permethrin was also done. Independent assessment of the operational feasibility of the introduction of rapid diagnostic kits and blister packs for strengthening the early diagnosis and prompt treatment under the enhanced malaria control project in Mayurbhanj (Orissa) and Kanker district (Chhattisgarh) were also undertaken. Technical training and health education supports were provided to antimalaria programme.

Sonapur (Assam)

The major areas of research included evaluation of therapeutic efficacy of antimalarials, situation analysis under roll back malaria (RBM) initiative, and malaria outbreak investigations in selected districts of Assam. The emergence of multiple drug resistance in *P. falciparum* has been detected in areas of stable transmission, and for their resistance in intensive surveillance coupled with antivector measures with a focus on insecticide-treated nets is being advocated. Other activities included GIS mapping of *An. minimus*, genetic composition of *P. falciparum* isolates, sibling species composition of *An. fluviatilis*, IEC activities during antimalaria month, and advocacy for ITMNs in northeastern states and mass propagation and distribution of larvivorous fishes (Guppy) in towns of Assam.

Panaji (Goa)

Technology transfer on bioenvironmental control of malaria to the Mormugaon Port was continued. The field station is maintaining 38 fungus isolates that have potential larvicidal activity, which are being characterised and tested in collaboration with Goa University. Susceptibility of *An. stephensi* to the insecticides DDT, malathion and deltamethrin was studied. Field evaluation of Primiphos-methyl (50% EC) against *An. stephensi* was done. Estimation of malaria disease burden in Goa and Maharashtra was done. Geographical reconnaissance of vector breeding habitats for advocacy of urban malaria control in Goa is being undertaken. Therapeutic efficacy of chloroquine in *P. vivax* malaria was evaluated in Navi Mumbai. Training support to antimalaria programme was provided.

Bangalore (Karnataka)

Use of larvivorous fish was scaled-up in five talukas of four districts and Mangalore city. Work on mosquito control plan in Bangalore city was carried forward. Monitoring of parasite sensitivity to chloroquine and susceptibility of *An. culicifacies* to malathion and deltamethrin was also done. To develop strategy for integrated control of vectors of malaria, JE and dengue in Karnataka work was undertaken in Mandya district. Based on *Pfprt* polymorphism, *P. falciparum* from south India was found of South American origin. Technical, training to different categories of local health staff and health education supports were provided to antimalaria programme.

Hardwar (Uttaranchal)

Monitoring of bioenvironmental control strategy which has been successfully demonstrated at BHEL, Hardwar, IDPL, Rishikesh and IOC, Mathura was done. Investigated insecticidal properties of plants code HARBAL and HAM from Garhwal region of northwest Himalaya. Botanical pesticides were evaluated for bioactivity against *An. stephensi*. Determined antimalarial activity of compounds isolated from a plant code CBF and antimalarial activity of oxidation products of sulfadoxine. Allethrin residues in the environment was examined. Studies have

been started on accumulation of persistent organochlorine compounds in sub-Himalayan region of north India. Provided consultancies to BHEL, Hardwar, IDPL, Rishikesh, IOC, Mathura and NTPC, Rihandnagar. Malaria surveys were done in NTPC, Kaniha (Orissa) and in Hardwar district (Uttaranchal).

Haldwani (Uttaranchal)

Dynamics of malaria transmission in some areas of Bhabar region, District Nainital, Uttaranchal was studied. Insecticidal susceptibility of *An. culicifacies* was evaluated in four districts of Chhattisgarh (as part of situation analysis) and two districts (Nainital and Udham Singh Nagar) in Uttaranchal. Small-scale field evaluation of Pyreproxifen 0.5% G against vector mosquito larvae in different habitats of Haldwani was undertaken. Technical, training and health education supports were provided to the antimalaria programme.

Chennai (Tamil Nadu)

Bioecology of *An. stephensi* and its role in disease transmission in Chennai was studied. Rainwater harvesting and its implication on vector breeding have been studied and a draft brochure has been prepared. Genetic diversity of *P. vivax* and *P. falciparum* in India using molecular markers was studied in a collaborative study with MRC (HQ). Therapeutic efficacy of chloroquine for the treatment of vivax malaria was studied. Susceptibility status of *An. stephensi* (Chennai strain) to various synthetic pyrethroids, organochlorine and organophosphorous compounds has been carried out. Evaluation of Temeguard (temephos 50%EC) and VectoBac tablets as a larvicide was also done. Other activities included technical support to various centres/institutes and collaborative research/scientific work. IEC activities and malaria clinic for catering to the health needs of the public by providing early diagnosis and prompt treatment.

Shahjahanpur (U.P.)

Geographic reconnaissance of mosquito breeding habitats in Shahjahanpur district was undertaken. Malaria surveys were conducted in some high risk PHCs. Situation analysis of malaria was carried out in four districts— Lakhimpur Kheri and Sonbhadra districts in Uttar Pradesh, and East Godavari and Visakhapatnam in Andhra Pradesh. Insecticide susceptibility status of malaria vectors was evaluated. Field evaluation of pyreproxifen (0.5% G), larvicide was done against mosquito vectors. Health education activities were also organised.

Shankargarh (U.P.)

Malaria situation analysis was undertaken in Ranchi and Hazaribagh district of Jharkhand and Garhchiroli in Maharashtra states. Malaria clinic at the field station provided early diagnosis and prompt treatment of malaria. The field station was involved in studying therapeutic efficacy of chloroquine in *P. falciparum* in

West Bengal. Technical support was given to Zonal Malaria Office in conducting *An. culicifacies* susceptibility tests against different insecticides like DDT, malathion and deltamethrin and also in training and IEC activities.

Car Nicobar (A & N Islands)

Ten hatcheries of larvivorous fish *Gambusia affinis* were established. Epidemiological investigations were done in seven creek and nine noncreek villages of Car Nicobar Island. Studies on the bioecology of *An. barbirostris* are in progress. Duffy blood group analysis was done in the primitive tribe (Nicobarese and Great Andamanese) of Andaman & Nicobar Islands. Malaria outbreak investigation was done in Mus village. Health education activities and antimalaria month was observed. Eighty group meetings were organised. Provided early diagnosis and prompt treatment service to the malaria patients (Defence personnel and Nicobarese tribe). Technical support and consultancy were provided to 37 Wing, Air force base, Car Nicobar and Bishop John Richardson Hospital, Car Nicobar.

