

8. Community-Based Approaches for Prevention and Control of Malaria

8.01 Demographic status of malaria in Yazd province of I.R. Iran during 1985-2001

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Malaria is one of the most important parasitic diseases in the world which cause more than one million death, annually. Malaria has been endemic in South and South-East of Iran. Yazd province, in the neighbourhood of those regions, was faced to imported malaria. This survey was conducted to determine the demographic status and profile of malaria in Yazd province from 1985 to 2001.

The present cross-sectional descriptive study was performed by using demographic informations of patients which was recorded by healthy centers of Yazd province. Data was analyzed with Spsswin software.

From 4306 cases of malaria which were diagnosed during 1985 to 2001, 4092 cases (95%) were male and 214 (5%) female. The most prevalence of disease were belonging to 1991 (19.6%) but the least belonged to 2001 (1.6%). The most cases of disease was seen in summer. Causative agents were; *Plasmodium vivax* (85.1%), *P.falciparum* (13.7%), *P.malariae* (0.1%) and mixed infection (1%). Nationality of studied patient were Afghanian, Iranian and others; 77.3%, 20.8% and 1.9%, respectively. 67% of patients were between 20 to 40 years old.

Result obtained from this survey revealed that the most cases of disease were related to immigrants from neighbour countries in South-East of Iran, that carries the parasite were mostly workers with 20-40 years old. In the recent years, although, with referring of immigrants to their country, cases of disease were decreased. However, for controlling program, a malaria diagnostic test on the immigrant workers, particularly Afghanian, is suggested before their arrival to Iran.

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8.02 Some ecological aspects of *Anopheles stephensi liston*, the main malaria vector in an endemic focus of malaria in Bandar Abbas district, south of Iran

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Bandar Abbas district is one of the Malaria regions in south of Iran. *Anopheles stephensi* is the vector of malaria in this area. Studies on different aspects of its ecology are essential for establishing the disease control programme.

Following the annual report of cases of malaria from different area of Bandar Abass district, Hormozgan provience, an investigation on some ecological aspects of this malaria vectors was carried out from April, 2002 to December, 2003. Entomological studies and mosquitoes collection were performed every 15 days from indoor and outdoor shelters as well as breeding places with the aid of suction tube and dipper.

Annual incidence of malaria has been different from 11.34 to 2.92 during ten years. Entomological researches found that five vectors species of malaria in this study had been previously recorded 2 decades ago. *Anopheles stephensi* was recognized as the main vector of malaria in this area with two peaks, one in May and the other in December. The most malaria transmission occurred in June and December.

The larval habitats include draying river bed with pools, rocky river pools, stagnant streams, slow foothill streams, temporary pools, slow moving water with or without vegetation.

Operational of insecticides for adult and larval control, as well as surveillance of malaria cases, would not assist effectively to control of malaria, so given another malaria control methods as impregnation of bed nets as well as repellent particularly in seasons when people are more exposed to mosquitoes bite, may be considered as an effective measure in controlling malaria in this area.

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8.03 Epidemiology, therapeutic agents and cost of management of paediatric malaria in a Nigeria tertiary hospital

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Malaria is the most widespread parasitic disease in sub-Saharan Africa with associated high morbidity and mortality especially among the highly predisposed population of pregnant women and children of age 5 years and below. Living in malaria endemic regions of the world have become associated with health and economic hazards placing financial and productive burden on affected households. A prospective study of children treated for malaria and other associated illnesses at a Nigeria Tertiary health Institution between April and October, 2003 was investigated. The various malaria-associated diseases treated were determined from their provisional diagnosis, hospital records and causative agents confirmed from their diagnostic laboratory results. Cost of treatment was determined from the patient's guardian and confirmed from relevant hospital departments. Common drugs for malaria treatment, their costs, relative effectiveness and frequency of use were determined through a completed questionnaire by health officers and patients guidance. Of 5356 pediatric patients suspected of having malaria, 5100 (95.2%) were confirmed positive for malaria parasites microscopically. Of these, 4119 (80.8%) were aged 0-6 years, with children aged 1 to 3 years being mostly affected. Eight hundred and twenty (16.1%) of them were in-patients spending an average of 6 days on hospital bed. Over 22.0 million naira (\$0.22m) was spent on the treatment of malaria with drugs accounting for the major cost (66.81%). About 33.7% of the patients had malaria complicated with other diseases. The effectiveness of common therapeutic agents used for malaria treatment, their costs and associated side effects is discussed. Recommendations are made for appropriate care and government subsidy for paediatric malaria management in sub-Saharan Africa.

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8.04 Feasibility of involving traditional health healers (Disharis) in the presumptive treatment of malaria cases in tribal areas in India

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The aim of the study was to assess the feasibility of utilizing the services of traditional health healers (Disharis) to provide access to malaria treatment in tribal community. Disharis from one of the Primary Health Centres in Malkangiri district, Orissa State, India were trained to differentiate malaria cases on the basis of clinical symptoms, provide presumptive treatment to all fever cases free of cost with pre - packed chloroquine tablets and keep the record by marking the number of cases treated from each age group against spaces provided in a record sheet. A referral card was also provided to each Dishari for referring severe cases to PHC. In a two-year period, 110 Disharis treated 84,522 suspected malaria cases from all age groups in a population of 53,653 and referred 69 non-respondent cases to PHC for management. Nearly, all (99.2%) the Disharis were able to treat the cases with correct dosages of chloroquine. The number of cases treated by a Dishari per month ranged from 0 to 40 with a mean of 12.7 ± 6.4 . As many as 107 Disharis continued treating suspected malaria cases with chloroquine for the entire study period. The malaria fever episode (morbidity) was significantly ($F=8.391$, $P= 0.004$) reduced to an average of 4.0 ± 2.5 days in treatment areas in comparison to an average of 6.2 ± 3.9 days in control area. The outpatient attendance in the PHC was reduced from 7146 in 1999 to 5477 in 2000 (23.4%) whereas in control PHC, it remained unchanged (12652 cases in 1999 against 12723 in 2000). Hence, it is feasible to include Disharis in drug delivery system as the services of Disharis largely improved the accessibility to malaria treatment facilities to the people. The method is being adopted by the State Health Department in other tribal areas.

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8.05 Community-based malaria prevention and control program of BRAC in Chittagong hill tracts of Bangladesh

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Malaria causes significant morbidity and mortality in the Chittagong Hill Tracts (CHT) region in Bangladesh. BRAC has been implementing malaria prevention and control activities in 3 districts of CHT since 1998 in close collaboration with the Government of Bangladesh. Shastho Shebika (health volunteer), a woman of average 35 years old is the nucleus of BRAC malaria control program. Each Shebika is responsible for 50-100 households. During their regular door-to-door visits, the Shastho Shebikas and Shastho Karmis (first line worker) provide information on malaria control and prevention. The program organizers conduct meetings with community members/leaders, religious leaders, local government representatives and teachers. Health education materials, including stickers and posters have been developed for use in the meetings. In each upazila (sub-districts), four outreach centers have been established in remote villages. A Shastho Shebika is assigned to work every day in each outreach center. She treats uncomplicated cases of malaria in the centre. Once a week, the program organizer visits outreach centers and collects blood samples for malaria parasite test and provide treatment for treatment failure cases or refer to the higher level health facility. Patients who participate in this program pay a fee of Taka 5, all of which is distributed to the Shastho Shebikas who ensures intake of the drugs. From September, 2002 to June, 2005, a total of 95,357 uncomplicated malaria cases and 4,593 treatment failure cases were treated and 44 cases were referred. Additionally 15,463 blood slides were examined and 6,918 were found positive. During this period 42,522 mosquito nets were treated with insecticide and 120,000 insecticide treated mosquito nets were distributed free of cost.

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8.06 Response of international medical student community towards problem of malaria and suggestions for developing a community based approach in medical education

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International Federation of Medical Students Association (IFMSA) is attempting to create awareness among medical students towards menace of Malaria in the developing world, particularly focussing on Africa. According to a study conducted among medical students in IFMSA, the students were very much concerned about impact of malaria on human lives and economy. They have shown concern specifically about emerging drug resistance in various *Anopheles* strains and community approaches to curb the spread. They have also expressed interest in imparting more undergraduate training to medical students on malaria and its complications. The IFMSA members resulted to establish a separate body for Anti-malaria activity in its structure, establish bylaws for the structure, execute practical training on malaria among its member organizations and arrange for a special fund to carry out the activities. It is also recommended that more medical students should be made aware of the global situation rather than just making them sit and learn about malaria in the conventional way.

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8.07 Malaria Research after 125 years: An anthropological perspective

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The disease malaria is identified. The parasite causing malaria is also isolated, the vector responsible for transmission is identified; the vector-controlling chemical is also earmarked. Besides these, the treatment and vector control chemical components were also synthesized. But we are unable to control malaria, why?

The parasite was described first in 1880 and in 1898 Sir Roland Ross described its complete cycle in a sparrow. During 1735 the Cinchona Tree was identified and in 1820 Quinine was isolated, subsequently Choloroquine was synthesized in 1934.

Where we lack has to be enlisted; often these are points discussed like motivation of the field level staff, Community participation in malaria control. Let us talk one by one. Who motivates the staff? Why the staff is motivated? Is community aware of the programme? Why should it participate and how?

Besides these, experience reveals that the decision making authorities has to be advocated as stake holders, which will change the malaria scenario overnight.

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8.08 Community participation through school based malaria control campaign, using behaviour change communication

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As per the guidelines of 'Anti-Malaria Month Campaign Operational Guide', campaign was designed at Malaria control department, Commissionerate of Health, Gandhinagar; to be implemented in the high risk areas of Kheda taluka, Gujarat. Based on 'Integrated model of communication for social change' and the strategies for malaria control in rural areas; central to this campaign is a 15 min. Animation Cartoon Film, which is based on 'Modeling principle' of Behaviour Therapy. Protagonist in the film is a school-child; with whom target audience can identify. He becomes 'Saviour of the village' because of his unmatched feats of fighting malaria. This character will act as a 'Role-Model' for school-children; which would prompt them to take same malaria-control steps to satisfy their desire for Social-Recognition and proving Self-Worth. This film will differ from other IEC-material in that it will act as a Catalyst and provides Motivation to school-children to behave in desired manner. The film will be broadcasted through the regional-Doordarshan channel, and will be viewed on a television-set at schools. Broadcast will be preceded by 'Teaser Poster-Campaign' to bring familiarity with the lead cartoon-character and also build up anxiety about the film. Teachers will be trained on malaria-issues, and will help in organizing Games like Snakes & ladders, Jig-saw puzzles, Field-visits, Role-plays etc. Teachers will be promoted to become DDCs through the campaign. Children will be supposed to keep specific-area, say 100-m around their homes free of breeding-places and to report fever-cases to the teacher, also to give information about re-impregnation of bed-nets, I.R.S etc at home. Points will be awarded for all such actions, and later a 'Title-ceremony/Award-ceremony' will follow on the Children's-Day (14th-Nov.) thus providing a Positive-Reinforcement for their involvement for the next time. Thus, this Behaviour Change Communication Campaign will inculcate the necessary skills and will facilitate desired-action through changed mindsets and modified behaviour for malaria control. The tenders of the film are under consideration and the campaign would probably be tested in Nadiad district in 2006.

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8.09 Community based approaches in malaria control introduction

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Despite concerted efforts to fight malaria, the disease has continued to be the leading cause of morbidity and mortality a situation exacerbated by the fact that over 70% of the population being at risk of being infected with malaria. The Roll Back malaria initiative was mooted to address this global disease of public health concern. Though strategies for rolling back malaria for instance in Africa have been designed and implementation of the same started since the year 2001 no positive results can be shown for this. For instance in the year 2000, 26,000 children under five years died annually in Kenya as compared to 34,000 in the year 2003*. If the situation is not checked it may get out of hand. Case Study For World Vision Kenya Gakungu RBM Project. The project is being implemented in Kenya, Central province at Maragua District. Implementation of the project activities is based on the foundation of partnership with stakeholders where the community is the main player in project implementation. The Government Ministry of Health being the custodian of health in the district in terms of policies and guidelines is involved in all stages of project implementation to ensure close monitoring of the community. The project is designed such that the community implements the project activities while MoH staff offer technical guidance and monitor implementation of activities in the community. Community organized groups are the vehicles of implementation of project activities. Community involvement has been enhanced through extensive sensitization of the community on malaria burden, health education on malaria prevention and control. Sustainability is ensured through training the implementing CBOs on micro enterprise and as CHWs. They conduct household health education, case recognition, referral of cases to health facilities, mobilize the community for vector control activities as well as selling ITNs\LLINs at a profit of Ksh.40.00. This creates a revolving fund which benefits both the individual and the groups. It also keeps the CBOs motivated and cohesive. The CBOs have been linked to a supplier of ITNs who supplies directly to them. As they market and sell the ITNs in the community, they ensure that the other RBM strategies such as environmental management, prompt and appropriate case management, management of malaria and anaemia in pregnancy and epidemic preparedness are observed in the community.

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8.10 Water storing practices among daily wagers/laborers: A field based study

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The present study was done with the aim of assessing water storing habits among Daily wagers/ labourers and also check for presence mosquito breeding if any. The survey was conducted in and around the vicinity of Safdarjang hospital, where ever labourers / daily wagers were working in small groups. Overall 19 sites were identified where some kind of construction was going on. Tents / "Jhuggis" where the daily wagers were living were identified in the area and the available person was interviewed. Details were filled in a pre-designed questionnaire. Questions on availability of any water supply near the working area / scarcity of water and habit of storing water for long periods were included in the questionnaire. The stored water was checked for mosquito breeding. Overall 19 tents where the wagers were residing, were checked for mosquito breeding in the stored water. 6 out of 19 tents were found to have mosquito breeding. 4 out of the 6 wagers forgot that they had stored water. Majority of wagers were storing water for 2-4 days.

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8.11 Knowledge, Attitude and Practice about malaria and acceptability of insecticide impregnated bed net in a malarious area, southeastern Iran

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A knowledge, Attitude and Practice (KAP) study was conducted in March to May 2005 by pre-trained interviewers using a pre-tested questionnaire in two communities in southeastern Iran, the aim was to determine the acceptability of specially designed for different aspects of malaria for implementation of insecticide impregnated bed net. Malaria transmission in this endemic area occurs through at the year, most of the malaria cases were observed from May to November in the age group of 5-25 years. Chloroquine was still the drug of choice for malaria treatment.

A total of 4294 inhabitants belonging to 992 families were randomly selected from intervention and from control. 31% of the population was children (< 15 years old) and only 9% were 60 years and above. Of those people aged over 14 years, 23% was illiterates. Within the same age group, 31% were farmers, 21% were engaged in domestic activities, 21% were students, 13% were official workers, self employed, or secretaries, 7% were unemployed, only 7% had academic degree.

Results showed that 99% of the respondents were aware that malaria is transmitted by mosquito bite, the rest believed that it is caused by eating stale food and unpotable water, 80% - 90% of the respondents were aware about signs and symptoms of malaria, breeding and resting habit of mosquito, and usefulness of residual spraying. 97% of respondents agreed that they would like to participate in malaria control activities. 97% of respondents in both communities agreed that they would like to participate in malaria control activities such as personal protection by impregnated bed net. Therefore, KAP study revealed that impregnation of bed net could be one of the measures for malaria control in the region.

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8.12 Accumulation of HCH and DDT in Garhwal region of Uttaranchal State, India

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Pesticides have made a great impact on human health and agricultural production. Despite the proliferation of different types of pesticides, organochlorines such as HCH and DDT still account for two thirds of the total consumption in the country because of their low cost and versatility in action against various pests. However, due to their chemical natures, they became major environmental pollutants. Higher than expected occurrence of these compounds in remote regions are the result of long-range transport in atmosphere, precipitation and cold condensation - the progressive volatilization in relatively warm location, plus subsequent condensation in cooler environments which leads to enhanced concentrations at high latitudes. Garhwal region of Uttaranchal state consists of the hills of sub-Himalayan region. Samples of water (57), soil/sediment (66), snow (4), human blood (110) and human milk (28) were collected from Garhwal region of Uttaranchal state and analysed for DDT and HCH contamination using gas chromatographic method. Results will be discussed to investigate the accumulation of these residues at different latitudes of Garhwal region.