

Malaria Country Report

Bangladesh - 2008

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EXECUTIVE SUMMARY

Malaria is one of the major public health problems in Bangladesh. In the 90's the upsurge of the disease has created an alarming situation with reports of focal *P. falciparum* outbreaks in northeastern border areas and increase of *P.falciparum* and *P. vivax* cases in the endemic areas.

The total number of reported cases in the country as reflected through the regular surveillance mechanism has increased from 53,875 in 1990 to 1,65,102 and 1,52,729 laboratory confirmed cases in 1994 and 1995 respectively. A total of 1, 00,864 laboratory confirmed cases were reported in 1996. Subsequently cases decline during 1997, 1998, 1999, 2000, 2001, 2002, 2003 and 2004 (68541 in 1997; 60023 in 1998; 63,738 in 1999; 55599 in 2000; 55646 in 2001; 63516 in 2002, 55909 in 2003 and 59,853 in 2004).

Bangladesh has about 4180 km border with India in its western, northern and eastern territory and a 190 km border with Myanmer (Burma) in its south-eastern side. Out of 32 bordering districts only 13 districts have malaria problem and some areas also belong to the epidemic prone areas. The forest and forest fringe areas particularly in the north eastern and south eastern border report more than 90% of total positive cases and more than 95% of total *P.falciparum* cases in the country.

Due to high level of drug resistance against CQ and SP the malaria treatment regimen has been recently changed. Now ACT is the recommended first line drug for the treatment of confirmed *P. falciparum* malaria cases.

An. dirus, *An. minimus* and *An. Philipinensis* are the principal vectors. All are susceptible to malathion and synthetic pyrethroid. Promotion and use of Insecticide treated mosquito net (ITMN), selective and focal spraying with insecticide and intensive IEC for increasing awareness of the people are the main component for vector control.

1. Introduction

Bangladesh is located in the north-eastern part of the South Asian sub-continent between latitudes $20^{\circ}34'$ and $26^{\circ}38'$ North, and longitude $88^{\circ}01'$ and $92^{\circ}41'$ East. It is bordered by India on the West, North and East and by Myanmar on the South-east. It has about 4,180-km border with India and a 190 km border with Myanmar. To the South lies the Bay of Bengal. Bangladesh has a land area of about 147,570 Sq. km. The total population of the country is 143.8 million. Its flat alluvial plains land provide some of the world most fertile agricultural lands. The land mass comprising mainly the delta of the three mighty rivers: the Ganges, the Brammaputra and the Meghna. The vast plain land is bounded by low hills in the North-east and South-east with an average elevation of 244 and 610 metres. The highest peak in the Hill-Tracts rises 1,230 metres above the sea level.

Bangladesh has a subtropical monsoon and short duration of dry winter climate, out of six marked seasons in a year. Winter (December-February), Pre-monsoon (March-May), Monsoon (June-August) and post-monsoon (September-November) are pre-dominant. The temperature ranges between 24°C and 39°C during summer months and between 10°C and 20°C in winter months, while the rainfall varies from 120 cm to 250 cm annually.

2. Background of Malaria Control Program

Malaria is one of the major public health problems in the country. Limited malaria control activities consisting of anti-larval measure and drug distribution in a piece-meal manner were carried out in the fifties. In 1961 a time limited phased Malaria Eradication Program was launched in the country progressed steadily except in some bordering areas in the northern and eastern parts of the country until 1976.

In June 1977, the vertical malaria eradication program was merged with the Integrated Thana Health Complex Scheme and a Plan of Operation was signed by the government and WHO in 1977 laying the strategies of Malaria control dividing the country broadly into low malaria risk and high malaria risk areas. The high malaria risk area was organized into 15 Malaria zones under two divisional malaria officers with specific Malaria control staff.

At present the malaria control activities are carried out through the Directorate of Disease Control under the Directorate General of Health Services. The Malaria and Parasitic Disease Control (M&PDC) unit is responsible for all activities for Malaria Control.

The impressive results achieved during the 60's through the Malaria Eradication Program (MEP) were being gradually eroded, mainly due to the integration of the MEP into the general health services and limited vector control operations. It was noted that major vector control operations had proven effective in controlling the disease in the past, but their cost and operational requirements had gradually escalated world wide, making it difficult if not impossible to mobilize the necessary resources on a long term basis.

3. Revised Policy & Strategy for Malaria Control

Bangladesh endorsed the **World Declaration** on the Control of Malaria and the **Revised Malaria Control Strategy (RMCS)** derived from the Amsterdam Meeting in 1992. As continuation of RMCS, a Country Working Group Meeting to prepare the policy and technical guidelines for the country implementation was held in December 1994. This Meeting

formulated the country Guidelines and Recommendations in order to implement the Revised Strategy for Malaria Control (RMCS) in Bangladesh. These guidelines form the policy basis for the gradual implementation of the Revised Malaria Control Strategy (RMCS) in Bangladesh.

4. Objectives of the Program:

- a) To reduce by the year 2010, the specific malaria mortality rate by 50%.
- (b) To provide early diagnosis and prompt treatment (EDPT) to all malaria cases.
- (c) To plan and implement selective and sustainable vector control measures including use of Insecticide Treated Mosquito Nets (ITBN) and Residual Indoor Spraying (RIS).
- (d) To develop and strengthen the malaria epidemiological surveillance system in order to provide adequate information for the planning and resource allocation required for malaria control activities at various levels (District level in particular)

5. Program Priorities & Strategies

- a) The adoption of the three malaria case definitions of Uncomplicated Malaria Presumptive (UMP), Uncomplicated Malaria Confirmed, and Severe Malaria (SM) for the Early Diagnosis and Prompt Treatment (EDPT).
- b) The adoption of revised reporting forms for Malaria Epidemiological Surveillance, which allow for the reporting of malarial deaths.
- c) Promotion and Scaling up of community based Insecticide Treated Bed Net (ITBN) program.
- d) Strengthening of malaria laboratory services and monitoring of Therapeutic Efficacy of standard antimalarial drug regimens.
- e) Strengthening of the epidemic preparedness and response capacity at the national, district and upazila (sub-district) levels.

6. Epidemiological Types of Malaria

The malaria areas of the country are distributed mainly in the border-belt zone of the country. However there are several ecotypes of malaria with defined epidemiological characteristics and vector distribution. Five major epidemiological types of malaria were re-defined during the country working group meeting which include:

- a) Malaria of Forested hills
- b) Malaria of Forest Fringe
- c) Malaria of plain Border Belt areas
- d) Malaria of plain rural areas
- e) Malaria in plain urban areas

Three malaria clinical case definition of uncomplicated malaria (UM), Severe Malaria (SM) and Treatment Failure Malaria (TFM) for the Early Diagnosis and Prompt Treatment (EDPT) of malaria cases of various malaria epidemiological types were adopted.

7. Entomological Information

Out of 34 Anopheles species (Spp.) recorded in Bangladesh, 7 (seven) Spp. have been incriminated as malaria vector, these are: (1) *An.dirus*, (2) *An.minimus*, (3) *An.philipinensis*, (4) *An. sundaicus*, (5) *An.aconitus*, (6) *An.anularis* and (7) *An.vagus*. The *An.dirus* and *An.minimus* are the main vectors in the forested hill and forest fringe areas. *An. sundaicus* is the main vector of coastal area of Cox's bazar. *An.philipinensis* is the main vector of plain rural areas and *An.aconitus*, *An.anularis*, *An.vagus* a *An.vagus* are the main vectors of border belt epidemic prone areas. From recent entomological observation *An.maculatus* group is strongly suspected to be a new vector in certain areas of northern border districts.

8. Vector Control Activities

DDT has been used over 30 years as the only insecticide for residual indoor spraying until 1991. However, it is now used (from 1994) in kala-azar vector control program. Since 1994, two insecticides; Malathion 57% EC for IRS and Deltamethrin 2.5% EC and 1% SC for treatment of bed-nets have been used for malaria vector control in the country.

In 1994, Malathion was sprayed in Kalmakanda upazila (Netrakona district) and Tahirpur upazila (Sunamgonj district) in the epidemic outbreak areas and desired impact on vector control was observed. Bed-net treated with Deltamethrin has been distributed for malaria vector control by way of personal protection in the above two upazilas with encouraging results. In the focal epidemic outbreaks during 1994-1995, the NGO's support had been sought to promote use insecticide treated bed-net (ITBN) with particular emphasis on the community education for use of bed-nets.

With this experiences the Malaria and Parasitic Disease Control Unit with the support from WHO is treating and re-treating the mosquito nets every year in the endemic areas. A total of about 120,000 to 140,000 mosquito nets are being treated each year. Now the program is preparing to submit application for the 5th round GFATM proposal where there is a provision to procure long lasting nets (LLNs). The program has already distributed some LLNs with the support from WHO Roll Back Malaria Initiatives.

9. Drug Policy and Drug Regimen

Emergence of drug resistance in some places are posing serious problem. A few reasons eg. indiscriminate use of Antimalarial drug by quacks, free sale of drugs from commercial outlet; and large proportion of non-compliance etc. contributed significantly to the process of development of drug resistance. Due to high level of resistance against CQ and SP the malaria treatment regimen has been changed as below:

Uncomplicated Malaria Presumptive (UMP): When presumptive diagnosis is done without laboratory confirmation by blood slide examination or RDT. The treatment for this category of patient is CQ + SP (CQ for 3 days with a total dose of 25mg/kg and SP single dose on the first day).

Uncomplicated Malaria Confirmed (UMC): When diagnosis is confirmed by Blood slide examination or RDT. The treatment is Coartem (ACT) for falciparum malaria. A total of 6 doses for three days duration will be provided. For vivax malaria CQ for three days followed by PQ for 14 days (45 mg for the adult daily).

Severe Malaria (SM): Parental quinine (Quinine di-hydrochloride 10 mg/kg body weight) until the patient is able to take orally followed by oral quinine with a total duration of 7 days. During outbreaks the multipurpose health workers are also trained to detect severe malaria cases and to give 1st dose of I/M quinine prior to referral to hospital or nearby temporary treatment centre. This has been reported very effective in prevention of deaths in large proportion of cases who used to take longer time for transportation to hospitals due to difficult communication.

After the introduction of Revised Malaria Control Strategy, ‘Diagnostic and Treatment Charts’ have been developed which is in the process of updating.

Adequate supply of antimalarial drugs at the district and upazila level have been emphasized. The district Civil Surgeons can procure antimalarial drugs from their yearly allocation of MSR budget (Medicine and Surgical Requisite) as per their need. The Essential Drug Company Ltd. is a semi-government production plant which can cater the need for production of antimalarials. However, importable items are procured either through WHO procurement system or international tenders by Central Medical Storage Depot.

10. Drug Resistance Status:

The presence of strains of parasite resistant to chloroquine was first detected in Haluaghata of Mymensingh district during 1970 and at Chaklapunji Tea-estate in Habigonj district during 1976 (both are the bordering districts).

Studies under WHO collaborative efforts have attempted to determine the extent of chloroquine resistant *P.falciparum* malaria. Mostly *P.falciparum* being confined to the hilly and forested areas of Chittagong Hill Tracts, Sylhet and Mymensingh, the studies were conducted in those areas. Results of the studies have shown to major changes in the situation. *P.falciparum* infection has become increasingly dominant in some focal areas (over 90%), and also the overall country proportion has an increasing trend. The degree of resistance of *P.falciparum* to chloroquine has increased. Chloroquine resistance increased from 10% in 1979 to 45% in 1987, 57% in 1992 (RII + RIII) with the unabated increase of the *P.falciparum* malaria in the forested areas; gross increase in drug resistance to standard chloroquine treatment; and intensive population movement from low endemic areas to hyperendemic areas, the situation is gradually worsening.

Reports from a randomized controlled trial (sponsored by ICOVED project) in one of the high-risk malarious zone (Ramu thana of Cox's Bazar district) has yielded a parasitological failure rate of 72% (95% CI, 65-79%) and an early treatment failure rate of 34% (95% CI, 26-41%) to the existing 1st line agent Chloroquine(CQ). The same study was also carried out in 7 other high endemic areas and it was found that the level of resistance of CQ against *Pf* cases is above the acceptable level of resistance. Based on these findings the M&PDC has updated the malaria treatment regimen as mentioned before.

The second-line regimen (Q3+SP, 2nd line) for treatment failure cases, has also shown a clinical failure rate of 21% (95% CI, 15-29%) in Ramu thana of Cox's Bazar district. Fortunately all of them had late treatment failures (LTF), i.e., there was initial defervescence followed by recrudescence between 8 and 28 days (mean time to clinical failure was 17.7 days).

11. Malaria Situation in Border Areas

Geographically, out of 64 districts in the country, Bangladesh has 32 border districts in the West, North, East and South-east. Only 2 (two) districts have international border to the South-eastern side with Myanmar and the rest with Indian states: Tripura, Meghalay, Assam and West Bengal of India in the Eest, North and West.

Majority of malaria laboratory confirmed cases are reported from the 13 border districts of the country. This area belongs to the forested and hilly zone and more than 96% of total positive cases and 99% of total *P.falciparum* cases are detected from these areas.

12. Epidemic preparedness and response:

The north and north-eastern border belt areas of the country are epidemic prone areas. Eight districts are in this area. The Malaria Control Program has developed a guideline for early detection and containment of malaria epidemics. Rapid Response Team has been formed and trained to combat epidemic. Out of the total 8 districts RRT has been formed in 3 districts and formation and training of RRT for the remaining district is in the process.

13. Global Fund :

Bangladesh achieved Global Fund Round 6 for Malaria in 2006. The Global Fund Round 6 Malaria component will be carried out by GOB and NGO collaboration in the 13 malaria endemic district of Bangladesh

Project period : 2007 to 2012

Implementing Partners:

M&PDC

BRAC and 14 sub-recipient NGOs

Goal:

Reduce burden of malaria in 13 high endemic districts by the year 2012

Objective:

Provide quality diagnosis and effective treatment to 80% of the malaria cases in 13 high endemic districts

Promote use of ITMN/LLIN in 80% of the household and selective IRS for containment of outbreaks

Strengthen program management and coordination and partnership in malaria control

Activities:

GOB is responsible for the following activities:

- Training of the government Medical Technologist (Lab), Nurses, Community health workers and Doctors in malaria prevention, diagnosis, treatment and program management.
- Procuring RDT and supplying them to the health facilities
- Procuring LLIN and supplying them to the NGOs
- Clinical malaria case examination by RDT and microscopy
- Providing antimalarial treatment
- Ensuring that health facilities have no stock outs more than one week of antimalarial drugs and goods at any time in first three months
- Treating and retreating the ITMNs
- Ensuring reporting timely, completely and accurately

NGOs are responsible for the following activities:

Establishing new microscopic centers. Additional laboratories, procuring microscope, Lab. equipments and supplies

Training new laboratory Technicians

Examining clinical malaria cases by RDT/ Microscopy

Providing antimalarial treatment through community based service providers.

Distributing LLIN, treating and retreating ITMN in use by the households

Training NGO partner's health staff and volunteers on BCC

Ensuring that health facilities have no stock out lasting more than one week

Ensuring health facility reporting timely, completely and accurately

Organizing advocacy meeting for community leaders, NGO representative and policy makers.

Conclusion:

Malaria of Bangladesh is similar with its neighboring countries. Although mortality is low but the burden is very high and the economic loss is enormous. In the past the disease didn't receive sufficient attention and resources for the control program were inadequate. But nowadays the international support for malaria is high. The international community strongly advocated for a drastic increase in resources for control of HIV/AIDS, TB and Malaria. The GFATM has provided substantial fund for commodities and scaling up the program during the 6th round for application.