Gezira Journal Of Health Sciences 2004 vol.1(1)

EDITORIAL

# Malaria in Sudan: past, present and the future

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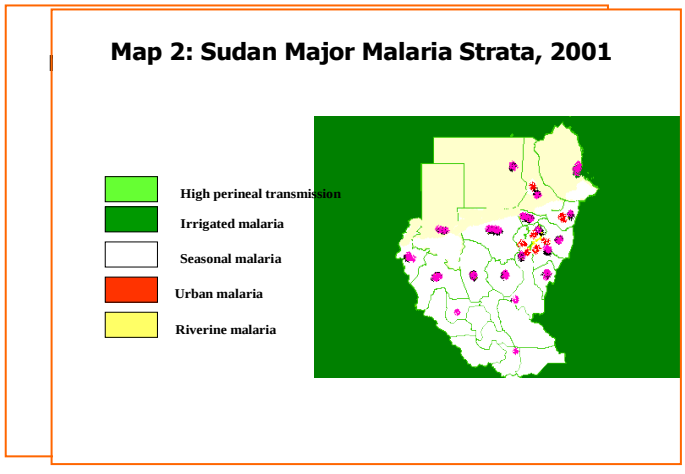
**Summary.** Malaria is a major public health problem in Sudan and this is the leading cause of death. A lot of efforts are done recently to decrease the prevalence adopting the RBM initiative with its well known six elements. There is a new protocol for treatment which would be launched in June 2004.

**Malaria Burden.** Malaria in Sudan is a major public Health Problem. It leads to an estimated 7.5- 10 million cases and 35000 deaths every year. The burden of the disease on the health system is a reality. Out of the total outpatients' attendance, admissions and deaths malaria represents 20- 40%, 30-50% and 15-20% respectively. These figures bring Sudan on the top of WHO / EMRO countries, as Sudan shouldered 50% of cases and 70% of deaths in the region (WHO/EMRO). Malaria is endemic throughout the Sudan. The endemicity level varies from hypo-endemic in the north - mesoendemic in the central part and hyper-and holo-endemic in the south. (Map 1). Considering other factors which serve as a background for malaria in Sudan; metriological, human behavior and activities, status of the control programme, country economic and social conditions, Sudan has been stratified to 5 strata (Map2). It is worth to mention here that 80% of the populations are living in epidemic-prone area-unstable malaria transmission.



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*Plasmodium falciparum* is responsible for about > 90% of cases, but other species are also present. The prevalence of *P. falciparum* in different region according to a comprehensive survey carried out by Prof. Walter Wernsdofer in 1960s ranged between 57% to 89% (unpublished data). Recent studies showed different picture. While in Khartoum at 1960s there were no detected cases, *P. falciparum* was found to cause 85.6% of cases in 1990s (Elsayed BB et al, 2000). *Anopheles arabiensis* is the main vector allover the Sudan. Other efficient vectors include *A. funestus* and *A .gambiae*.

Malaria in pregnancy (MIP) in Sudan constitutes a real problem. According to a survey conducted by the National Malaria Control Programme (NMCP) in 2003, >60% of health personnel working in obstetric departments admitted that malaria is a public health problem. A recent published study confirmed that it was a cause of 37.2% of all maternal deaths at hospital level (Dafalla SE, 2003),

**Past efforts to control Malaria in Sudan.** Malaria Control Programme in Sudan is the oldest in the Tropics. The first organized control programme was developed by Dr. Andrew Balfour early at the beginning of the last century. Dr. A. Balfour succeeded to eradicate malaria in the area known as Khartoum Urban area using retained oil and environmental management (A. Balfour 1904). The last place to eradicate malaria from was the Public Palace.

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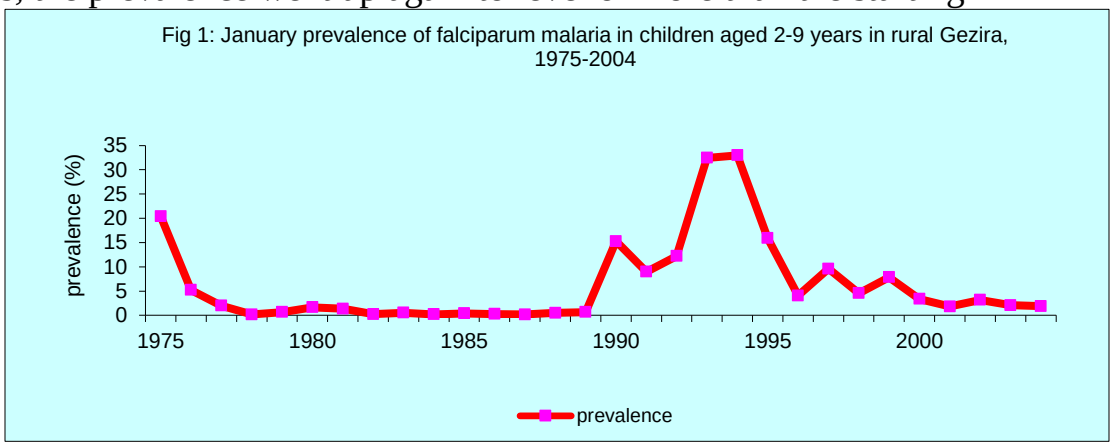
During eradication era, Sudan conducted a successful project in Sinnar area. Unfortunately by the time Sudan provided its evidence that eradication is possible; the world had changed its policy to control rather than eradication. Efforts to control malaria, then after, continued. The most prominent is the Blue Nile Health Project. The project fully supported by USA, Kuwait, Japan, World Bank and WHO succeeded to reduce malaria from >20% to<1% (fig1) but with the cessation of the programme by the end of 1980s, the prevalence went up again to level of more than the starting level




(unpublished data).

After the wide decentralization early in 1990s, some states carried out a successful control projects. Khartoum and Gazera are the best examples. Gambia project, a malaria control efforts in the Northern state supported by Egypt is another project. It has succeeded to make Wadi Halfa a malaria-free area (that is the only area in Sudan confirmed to be malaria free). All cases reported in this area were imported cases (unpublished data).

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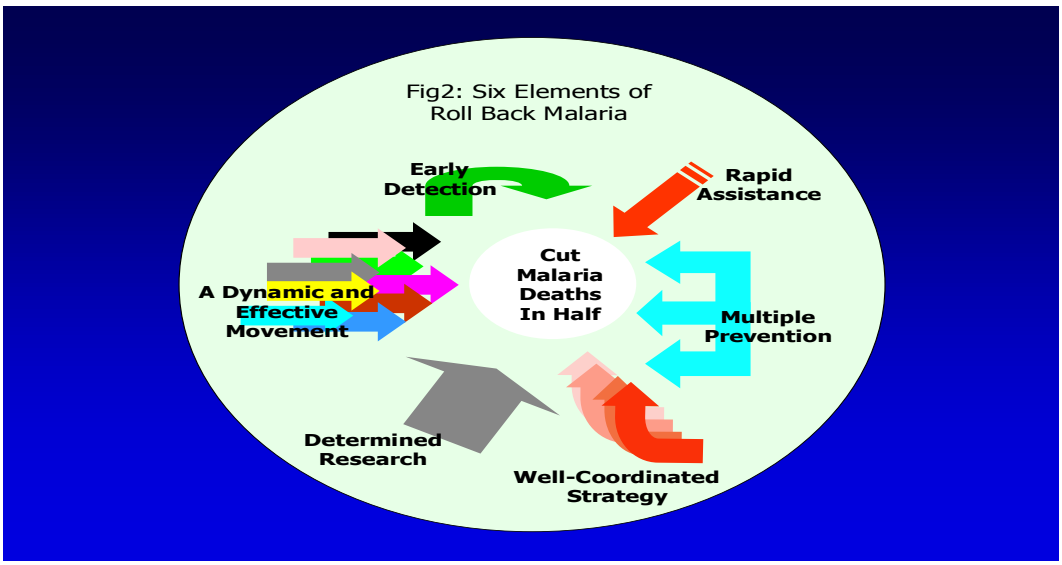
**RBM in Sudan.** The launching of the Roll Back Malaria initiative (RBM) in 1998 gave new hope to malaria control. RBM is a Global Partnership aiming to reduce malaria morbidity and mortality by 50% by the year 2010 based on RBM six elements (fig 2). Sudan is one of the first countries that behave positively with the initiative. RBM base-line survey was conducted and RBM strategic plan was developed early.




**Sudan RBM Strategic Plan.** Based on RBM objectives and elements with the contribution from different partners Sudan RBM strategic plan was developed in 2002. The plan aims to halve malaria all over Sudan by 2010 in terms of morbidity and mortality. Adopted Strategies include: Early diagnosis and prompt treatment, multiple prevention (vector control, Insecticide Treated Nets –ITNs and Intermittent Preventive Treatment -IPT), forecasting, early detection and containment of epidemics and building capacity. The programme, however, as part of Africa community is committed to Abuja targets (Abuja Declaration, 2000) which calls for:

1. At least 60% of those suffering from malaria have prompt access to and are able to use correct, affordable and appropriate treatment within 8 hours of the onset of symptoms.
2. At least 60% of pregnant mothers and children under 5 should be covered with ITNs.
3. At least 60% of pregnant mothers benefit from IPT.
4. At least 60% of epidemics were detected and delt with in 2 weeks of

initiation.

5. At least 60% of facilities should report no disruption of drugs for 2 weeks for the last 3 months.

**Progress so far.** By the end of April 2004, the NMCP have reached the following in each area:

**Early diagnosis and prompt treatment.** The NMCP based on Local evidence and taking into consideration the regional and international ones has decided to shift to ACT (artemisinin -based combination therapy). The first-line for malaria treatment is (Artesunate + Sulphadoxine-Pyrimethamine) and the second-line is (Artesunate + Lumefantrine). The recommended treatment for malaria in pregnancy is either Quinine all over the pregnancy (or "Artesunate + Sulphadoxine-Pyrimethamine" or "Sulphadoxine-Pyrimethamine" alone in the 2nd and 3rd trimester). Sulphadoxine-Pyrimethamine is recommended for intermittent preventive treatment in pregnancy.

Microscopic diagnosis was found to be weak. In a survey conducted by the NMCP in 2003, 20% of microscopes were not functioning in urban area. This contributed to high false positive slides. A WHO Consultant with the National expert agreed upon a plan of action to improve the situation and it is on the ground now. Increasing the access to proper case management and to antimalarial treatment is given a lot of concern. Solutions include adoption of home management, communication for behavioral impact (COMBI), free drugs...ect.

**Multiple Prevention.** "Malaria Control (=) Vector Control (=) Spraying with the insecticide". This quotation reflects the community understanding of malaria control. If you would like to please the community, the leaders and to some extent the professions, go for spraying. This is the main challenge facing malaria control. As part of the process of development of RBM strategic plan a lot of discussion was carried out in this area. The outcome is that, vector control should follow the NMCP recommendation which is based on the stratification presented in Map 2 (Table 1).

Insecticides treated Nets were increasingly recognized as a powerful tool. The NMCP has succeeded to delete taxation and tariff on ITNs (equal to

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60% of Net price) to make it affordable. Efforts to involve the private is about to give its fruit. Intermittent preventive treatment for pregnant mothers using Sulphadoxine-Pyrimethamine was recommended for malaria in pregnancy now.

***Table 1: recommended interventions per strata as identified in RBM strategic plan, 2002-2010***

| **Strata** | **States** | **Selected Interventions** |
|---|---|---|
| Desert Fringe | Northern, River Nile, Red Sea except Port Sudan and North Darfour except Elfashir | Case management, ITNs, source reduction where appropriate (with community involvement), IRHS during emergency |
| seasonal malaria (Poor Savannah) | Rural areas in Greater Darfour, Kordofan, Blue Nile, White Nile, Sinnar, Gezira, Gedarif, Kassala and Khartoum | Case management, ITNs, Insecticide Residual House Spraying during emergency |
| Stable perennial transmission | Southern Sudan | Case management, ITNs and IPTs. |
| Urban malaria | Khartoum and all large cities e.g. Port Sudan, Wad Medani | Case management, ITNs, source reduction where appropriate (with community involvement), larviciding, IRHS during emergency |
| Irrigated Schemes | All large- scale irrigated schemes (Gezira, Elrahad, Kinana, Asalia, | Case management, ITNs, targeted IRHS, IPTs, source reduction where appropriate (with community involvement) during emergency |

| | | |
|---|---|---|
| | West Sinnar, New Halafa and Elzidab) | |

**Epidemics Containment.** The NMCP has developed since July 2001 a weekly-based notification system from sentinel sites from 16 states recognized as epidemic-prone states (north Sudan states).There is a regular feedback from the NMCP to states and an epidemic threshold was made for each state. A WHO supported project, addressing the forecasting of malaria epidemic is going on in 5 states. The project considers various aspects of malaria including metrological data. Unfortunately the system failed to detect small outbreaks in North Kordofan, White Nile and Gazera sates during 2003. The problem is that the malaria managers at state level deals with the data collectively and in some states they didn't look to data carefully.

**Capacity-building.** Malaria is a local disease ie the factors that mitigate malaria in an area depend on the local condition (Richard Carter, 2000). The NMCP gives more attention to build the state capability. Efforts carried out include: basic training in malariology at Blue Nile Research and Training Institute targeting training at least 3 in each state; facilitate sharing experience through arrangement of state malaria control managers meetings on regular basis; providing supportive supervision and assistance with supplies and equipments that covered 40-60% of the need.

**RBM Partnership.** The NMCP works in close collaboration with many actors. On the top of the list are WHO and UNICEF. Plan Sudan through the GSK project in White Nile State has a close contact with the NMCP. Other NGOs (MSF-F, MSF-H, SRC, GHF…..ect) play major role at National and at local level. Egypt through Gambia project provides an enormous support to malaria control programme. Some States went far in this aspect; malaria free initiative in Khartoum and Gezira are a wonderful partnership between NMCP, State Ministry of Health and WHO. This partnership in addition to government and community support provide a lot of resources to control

programme, however, an increasing local support is needed to sustain any success.

**Constraints and Challenges.** In spite of all the efforts carried out, the programme faced many problems. These include: Staff turnover, shifting to expensive drugs although effective, Global Fund Support not on the ground yet and irregular government funding. To avail ITNs through the private sector and make malaria treatment free are the main challenges.

**Conclusion.** Malaria is a major public health problem in Sudan. Efforts to decrease the burden were building up. Shifting to artemisinin-based combination therapy and availing ITNs is expected to give the fruits soonly on malaria burden.

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