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CTD/MAL/95.2  
Distr.: limited  
Original: ENGLISH

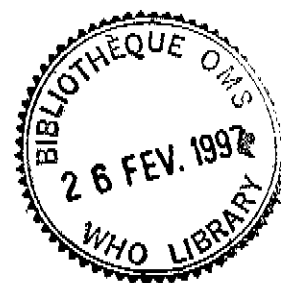


SUBSTANTIVE SESSION  
1995

**COORDINATION OF THE ACTIVITIES  
OF THE UNITED NATIONS SYSTEM**

**PREVENTIVE ACTION AND INTENSIFICATION  
OF THE STRUGGLE AGAINST MALARIA**

**ACTION PLAN  
FOR MALARIA CONTROL  
1995 - 2000**



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## EXECUTIVE SUMMARY

This document provides an Action Plan for international cooperation in malaria control for the period 1995-2000. It is based on the implementation of the Global Malaria Control Strategy that was endorsed by a Ministerial Conference, the World Health Assembly and the United Nations General Assembly and has been extensively reviewed within WHO, as well as by other UN organizations and multilateral and bilateral agencies.

It summarizes the achievements in the two years since the adoption of the Global Strategy, identifies constraints, and sets objectives, priorities and targets for malaria control until the year 2000.

The plan emphasizes:

- partnership among all UN organizations and other agencies involved in malaria and its control with WHO carrying out its normative function aimed at ensuring the best quality of technical cooperation with endemic countries;
- planning region by region towards country specific plans of action that are realistic, affordable and respond to national needs;
- rapid application of technical developments and guidelines;
- integration of malaria control activities with the general health services and other health programmes;

Priority is given for support to national control programmes to strengthen their national and local capabilities for malaria control according to the principles of the Global Strategy, so that they contribute to overall health development in the context of primary health care. Training is being used as the main instrument to achieve such capability strengthening in the following areas:

- the development, implementation, monitoring and evaluation of appropriate national plans of action for malaria control;
- disease management by the development and implementation of antimalarial drug policies, strengthening of diagnostic and treatment facilities and, especially, the improvement of self treatment in the community;
- selective and sustainable preventive measures, including vector control;
- the early detection, containment and prevention of epidemics and the timely reaction to emergency situations; and
- programme management and surveillance to assist countries with the establishment of epidemiological and managerial information systems to provide control programmes and the international community with relevant information on the status of malaria control in the world.

Priority is also given to research and development and coordination. The former is orientated to solving local operational problems in the implementation of malaria control; the

development and introduction of selective and sustainable preventive measures including vector control, vaccines and the prevention of malaria in pregnant women; and the development of new drugs. Coordination activities will be centered on the mobilization of financial resources and multisectorial partnership of all interested parties in integrated malaria control activities to ensure the implementation of common policies, continuity of action and optimal use of resources at international and national levels.

## ACTION PLAN FOR MALARIA CONTROL 1995 - 2000

### 1. INTRODUCTION

In 1993 WHO developed a Plan of Work for the period 1993-2000 for international cooperation in malaria control. The technical basis for this Plan is the Global Malaria Control Strategy which was endorsed by a Ministerial Conference in 1992, by the WHO Executive Board in Resolution EB 91.R4 in 1993 and by the 49th Session of the United Nations General Assembly in 1994. This Plan of Work was also based on the need for continual review and evaluation. It has, therefore, been reviewed in detail by Meetings of Interested Parties in Malaria Control in 1993 and 1994. In addition, an internal review of the status of the implementation of the Global Strategy was conducted in October- December 1994 by the Malaria Unit at WHO Headquarters in collaboration with all WHO Regional Offices. It has also been reviewed by other UN organizations involved in malaria and its control.

This current Action Plan provides a summary of the status of the implementation of the plan of work, outlining how priorities were set, some of the constraints observed and the achievements during the first two years since the adoption of the Global Strategy. It also outlines future priority activities and is updated in light of the comments of various reviews.

The period 1993-94 has emphasized partnership among all UN organizations and other agencies involved in malaria control with WHO carrying out its normative function, aimed at ensuring the best possible quality of technical cooperation with countries. Technical developments and research developments have been translated into policy and guidelines that have consequently been used to assist countries in planning malaria control and have formed the bases of training and health educational materials and training courses. Training has been carried out in synergy with control programme support which has often started with planning and resource mobilization. Training was initiated with national programme staff since it is they who have the responsibilities to transmit malaria skills and messages to the general health service staff and to the public.

Priority during 1993-94 was therefore given to:

- \* developing global and regional goals and objectives that are realistic and responsive to national needs and situations;
- \* provision of guidelines and standards for the implementation of the Global Strategy by countries and their international partners;
- \* developing indicators for epidemiological and managerial information systems;
- \* development of regional strategies and guidelines for the implementation of the Global Strategy;
- \* assistance to countries to review their malaria situation and the availability of local resources, and to develop national plans of action for malaria control in line with the Global Strategy;

- \* provision of technical assistance to countries facing epidemic and emergency situations;
- \* development of a training programme for strengthening national capacities for malaria control;
- \* in close collaboration with the UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases (TDR), the establishment research programmes orientated both to the development of new tools and approaches and the application of existing ones for diagnosis, treatment and prevention as well as strengthening the national research capabilities;
- \* the mobilization of political support and the coordination of participating agencies in malaria control.

More detailed summaries of the achievements during the period 1993-94 are given in respective sections of the Plan of Work below.

Experience has shown that without both external financial support for planning and implementation and improving programmes' capacity to overcome operational problems which hamper the implementation of activities at the periphery, the best guidelines and technical advice will be ineffective. Social, political and economic changes all contribute to the worsening malaria situation, particularly through population movements, ecological disturbances, construction and environmental change that create environments favourable to malaria transmission. Thus, the systematic solution of these constraints through increased political commitment, intersectorial cooperation, health education and community participation will be critical to the implementation of sustainable malaria control and the success of this Action Plan. Thus, future activities will concentrate more on support to mobilize political and financial support to overcome these constraints in priority countries. The development and strengthening of the information systems to monitor these activities should provide the necessary data and guidelines to assist public health authorities to implement or change policies for malaria control.

The Plan of Work however still continues to place strong emphasis on:

- *international team-work and partnership*
- *planning region by region towards country specific plans of action*
- *rapid application of technical developments and guidelines*
- *integration with the general health services and other health programmes.*

## 2. GLOBAL MALARIA CONTROL GOALS AND OBJECTIVES

The overall goal for malaria control is:

*the prevention of mortality and the reduction in morbidity and social and economic loss due to malaria, through the progressive improvement and strengthening of local and national capabilities for malaria control at national, district and community levels.*

Within this goal, two main objectives have been set:

- \* *that by the year 1997 at least 90% of countries affected by malaria implement appropriate malaria control programmes;*
- \* *that by the year 2000 malaria mortality has been reduced by at least 20% compared to 1995 in at least 75% of affected countries.*

The goal and objectives are based on the recommendations of three interregional meetings of national programme managers and partners in malaria control, a process by which the Global Malaria Control Strategy was developed. More specific Regional targets have been developed by 5 Regional Working Groups on Malaria Control held during 1993-94.

In many countries, malaria control programmes either did not exist or became very depleted so that it must be understood that a reasonable time-lapse must take place before lasting results can be seen.

### 3. ESTABLISHMENT OF REGIONAL PRIORITIES

In setting priorities, the following major problems faced by malaria control have to be recognized:

- \* in most countries of Africa south of the Sahara, where 90% of malaria mortality occurs, malaria control activities are limited and the quality and coverage of disease management by existing health services are still inadequate;
- \* many control programmes in the rest of the world lack the managerial and epidemiological capability to reorientate their activities according to the Global Strategy;
- \* many countries lack both adequate financial and technical resources for implementing their malaria control programmes.

Thus, priority for the WHO Region for Africa in WHO's Plan of Work is given to:

- \* the establishment of appropriate national malaria control programmes and the implementation of plans of action in line with the Global Strategy;
- \* the strengthening of the general health services, health care providers from other sectors and the communities themselves to provide early diagnosis and prompt treatment, i.e. disease management;
- \* combatting the increasing occurrence of epidemics and emergency situations in various parts of Africa.

For the Rest of the World, priority is given to:

- \* reorientation of existing malaria control towards the principles of the Global Strategy;

- \* improving provision of basic curative services at all levels of health care and the promotion of rational drug use;
- \* selective use of disease prevention methods, including selective vector control.

#### 4. ESTABLISHMENT OF APPROPRIATE NATIONAL CONTROL PROGRAMMES

What constitutes an appropriate malaria control programme depends on local conditions but the following criteria are generally applicable:

- long term political commitment to implement malaria control in accordance with the principles of the Global Strategy;
- sustainable national financial support to malaria control in the context of health care and overall development;
- development of a national plan of action with realistic and clear objectives and targets to reduce malaria mortality and morbidity;
- support to the health services to assure early diagnosis and prompt treatment of malaria disease;
- establishment of a national core of specialists to assist the general health services in taking their responsibilities for control;
- development, within the health and other related sectors as well as in the community, of the capacity for undertaking preventive measures, including selective vector control;
- development of national capacity to undertake operational research aimed at improving the cost-effectiveness of antimalarial activities.

#### 5. PLAN OF WORK

The activities within WHO's Plan of Work for Malaria Control are broadly divided into the following six closely interrelated categories:

- \* National control programme support (including emergency assistance and operational research)
- \* Definition of standards and guidelines
- \* Training
- \* Health education and communication
- \* Programme management and surveillance
- \* Coordination.

The activities related to the definition of standards and guidelines, training, and health education and communication are described below in support of the targets related to the implementation of the Global Strategy by national control programmes.

A projected timetable of activities towards the main objectives of malaria control, focusing on milestone events and key targets that have been proposed globally and by Regional Group Meetings, is given in Annex 1.

This plan will require periodic revision. New technological developments, especially the availability of vaccine for operational use, could change the picture substantially. One synthetic vaccine for falciparum malaria, SPf66, has been extensively tested in clinical and field trials, initially in South America and more recently in Africa and South East Asia. This vaccine, developed by Professor M. Patarroyo in Colombia, has been shown in a field trial cosponsored by TDR to be safe, to induce antibodies and to reduce the risk of developing clinical malaria by 30% in Tanzanian children under 5 years old. Taken together with the results from South America, the Tanzanian results confirm the potential of the vaccine to confer partial protection in areas of high as well as low intensity of transmission. Other trials are being conducted in Colombia, The Gambia and Thailand. A milestone meeting will be held in September 1995 to review all the data from these clinical and field trials and to decide a policy for further development, production and use of the Colombian vaccine. Other candidate vaccines have been identified by Institutes in Australia, France, Sweden, Switzerland, UK, USA and, as part of a UNIDO supported project, in India and Italy. Some of these will enter Phase 1 clinical trials in 1995. While these results are encouraging, there is considerable work still to be carried out before the operational use of a malaria vaccine can be realized.

## 5.1 National Control Programme Support

The Objective is to:

***strengthen national capabilities to plan, implement, monitor and evaluate malaria control according to the principles of the Global Strategy.***

Direct support to countries is the main activity of the Malaria Unit at Headquarters, accounting for over 40% of the budget in 1993-94. This is carried out in close collaboration with the Regional Offices as well as other partners in malaria control at the national level, e.g. the European Commission, UNICEF, the World Bank, bilateral agencies, WHO Collaborating Centres, and national institutes such as CDC, Atlanta, USA, and the Malaria Consortium, UK.

### 5.1.1 Establishment of country priorities

During the period 1993-94, priority was given globally to malaria endemic countries in Africa south of the Sahara. These countries were classified into four categories, based on criteria such as the level of development of the health care infrastructure, the availability of trained staff, the level of development of the national malaria control programme, and the political commitment of the government to control the disease. Based on these criteria countries were selected initially either for intensified or moderate financial support from extrabudgetary funding.

Countries with reasonably well developed malaria control programmes, with resource commitment, some managerial capacity at central and regional levels and the capability to implement various control activities such as disease management, vector control, detection and

control of epidemics e.g. Botswana, Ethiopia, Madagascar, Namibia, South Africa, Swaziland and Zimbabwe.

WHO, in collaboration with the Directorate General of Cooperation for Development of Italy, the Overseas Development Administration of the United Kingdom (ODA), UNICEF and the World Bank, has provided the following inputs to these countries;

- provision of technical assistance to orientate the specialized services towards selective vector control and the transfer of the responsibility for disease management to the general health services;
- strengthening capacity of the programmes at the central and district levels to develop epidemiological and managerial information systems for monitoring the malaria situation and programme implementation, particularly for the early detection and control of epidemics;
- training of general health services staff at all levels to assume responsibility for malaria disease management.

Countries with reasonably well functioning health care infrastructures, with a national team for malaria control at the central level, but with a malaria control programme which is not yet well developed, e.g. Benin, Ghana, Guinea-Bissau, Uganda, Zambia. WHO, in cooperation with ODA, the United States Agency for International Development (USAID), and UNICEF, has given assistance in;

- development of realistic and sustainable national plans for malaria control;
- development of epidemiological managerial capacities at the regional and district levels;
- training of health workers, particularly at the district level, in malaria control;

Countries with health care infrastructures destroyed by civil war or instability, e.g. Angola, Burundi, Chad, Eritrea, Mozambique, Rwanda, Sudan. As soon as conditions stabilize, a comprehensive assessment of the situation will be made to facilitate the introduction of disease management activities. Meanwhile, WHO in cooperation with the European Commission, the Italian Cooperation, ODA, UNDP, UNHCR, UNICEF and NGO's has given emergency assistance for malaria control to Burundi, Eritrea, Ethiopia, Madagascar, Namibia and Rwanda in 1993. Mass population movements from such countries affect the ability of their neighbours to provide health care and malaria control. In such cases emergency assistance was also given in 1994 for malaria control in Rwandan refugee populations in Burundi, Tanzania and Zaire.

Countries with minor malaria problems, which are primarily engaged in surveillance, e.g. Algeria, Mauritius, Morocco. Support is needed for improving existing surveillance mechanisms.

Support to malaria control programmes from WHO's Regular Budget for global and intercountry activities will be based on the above priorities. In addition, two or three countries in each Region may be now selected globally for receiving more intensified support from extrabudgetary resources to acquire and document experiences which may lead to an increased extrabudgetary funding. This support will be consistent with the development of the countries

health services and will aim at sustainability of the results, which should be applicable and accessible to other countries in similar circumstances.

The criteria for selecting these countries include the following:

- government commitment to lead and support malaria control by a plan of action in line with the Global Strategy;
- government collaboration and coordination with WHO, as well as other international and bilateral agencies, NGOs and other institutions involved in malaria and its control;
- sufficient institutional and human resources to support the plan of action for control;
- malaria control in the country is considered one of the critical steps in health development;
- the malaria situation in the country represents one or more of the major epidemiological types recognized by the Global Strategy;
- existing or potential collaboration with national research institutions;
- adequate conditions for both national intra- and intercountry training.

Whilst additional funds will be required, care has to be taken that the levels of support provided are not beyond the amounts normally accessible to countries in similar circumstances. Otherwise the results will not be sustainable. This initiative will not deter efforts to further support and strengthen malaria control in all the countries.

#### 5.1.2 Technical assistance to countries

##### 5.1.2.1 *Strengthening national capability to plan malaria control*

#### **Objective:**

to develop nationally a core group of specialists with an intimate knowledge of malaria as a disease, who have the ability to: select malaria control strategies dependant on the local evolving situations; advise the general health services on the management of malaria disease; guide, wherever applicable, the selective use of protection measures, including vector control, and; ensure intersectoral collaboration and community involvement. This core group should be able to develop the national malaria control policy, defining targets and responsibilities to implement and monitor and evaluate this policy.

#### **Target:**

by the end of 1997, 80% of endemic countries in Africa south of the Sahara have functional malaria control programmes with national programme managers trained to plan, implement, monitor and evaluate malaria control according to the principles of the Global Strategy and regional guidelines.

**Major Achievements:**

Global estimations of training requirements have been made for 1993-1997. These indicate that more than 800 programme managers, 1 400 specialists, 13 000 assistants, some 55 000 workers at the district level and some 120 000 community health workers need to be trained or retrained. This task requires at least US\$ 27 million, mostly from multi- or bilateral sources. It will be integrated with other health delivery programmes at the district and community levels.

Estimates made by WPRO indicate that average cost of training health workers in the Philippines and the Solomon Islands is around US\$ 200 per participant, rising to over US\$ 800 each for supervisors for microscopic diagnosis.

The list of training modules, manuals and aids that have recently been produced is given in Annex 2. Considerable progress has been achieved in their development as interactive teaching programmes, particularly within the context of the MANTEAU Initiative (involving the Training Unit of CTD, the European Commission, UNDP and national research institutes). Several of these teaching materials are being field tested.

Detailed timetables exist for the Regional training programmes that are coordinated with activities at the country level. During 1993-94, 129 senior programme managers and specialists, including those from more than 25 countries of Africa south of the Sahara, were trained in international courses in the planning, implementation and evaluation of malaria control in accordance with the Global Strategy. Intercountry courses for the training of trainers in malaria management and control were completed for the African Region in 1994, resulting in the training of over 150 trainers. These trainers will now be responsible for country level training of district health officers.

Well established country training programmes exist in the Western Pacific Region e.g. in Cambodia, China, Malaysia, Solomon Islands and Viet Nam. The Lao People's Democratic Republic and Philippines have plans to upgrade their training programmes.

**Future Activities:**

Priority will be given to:

- updating the training need assessment in light of the experiences in 1993-1994;
- completing the field evaluation of existing training materials and their adaptation into interactive programmes;
- intracountry training of district health officers in malaria control. Such courses will be supported by CTD/MAL in 1995 in 17 countries, including 11 in Africa south of the Sahara, identified by WHO as in need of intensified support. Others will be supported at the regional level, including 19 countries of the African Region. In addition, training courses in malaria control will be held in 1995 for primary health care doctors and vector control staff from epidemic prone areas of Turkey with the support of the European Commission.

Within the context of decentralization of health care, a 3-month national training course will be held, with support from the Netherlands government, at the Nazareth Training Centre, Ethiopia, for programme managers in order to strengthen the capability for planning, implementation and evaluation of malaria control at the regional level.

There is a plan to establish two training centres for the Eastern Mediterranean Region in Iran and Sudan. In South East Asia, the training of district level staff will be continued in Bangladesh, India, Indonesia, Myanmar, Nepal and Sri Lanka, with particular emphasis on epidemic prone areas of India and Nepal (with the support of ODA).

A three months international course on malaria control is planned to take place in Thailand in 1995.

5.1.2.2 *Development and implementation of national plans of action for malaria control*

**Objective:**

to strengthen the capacity of countries to plan, monitor and evaluate malaria control according to the principles of the Global Strategy.

**Targets:**

for Africa south of the Sahara, that 80% of the countries have formulated up-dated plans of action by 1995;

for the Rest of the World, that all countries will have reorientated their national malaria control programmes by 1997;

by the end of 1995, 50% of malaria affected countries are implementing national plans of action.

**Major Achievements:**

Guidelines on the implementation of the Global Malaria Control Strategy have been produced (WHO Technical Report Series No 839, 1993) and adapted at the Regional level with particular emphasis on the development of information systems for the evaluation of malaria control programmes (WHO/AFRO unpublished documents AFRO/CTD/MAL/94.2 and AFRO/CTD/MAL 94.3). These documents have been made widely available to all countries and Ministries of Health.

Most of the 45 endemic countries of WHO African Region have received financial support for developing their programmes and some have shown increased commitment to malaria control by mobilizing additional national resources, e.g. Botswana, Ethiopia, Namibia, and Zimbabwe. By the end of 1994, 25 countries in Africa had completed the preparation of plans of action and 10 had already started to implement them.

In other Regions, progress has been made in many countries towards the required reorientation of their national programmes in line with the Global Strategy. 10 countries in the Americas and 5 in the Eastern Mediterranean have completed their plans of action, whilst

reorientation is in progress in all 9 countries of the South East Asian Region. 18 out of these 24 countries are implementing malaria control according to the current strategy. The process of reorientation of the programmes in the Eastern Mediterranean Region is, however, seriously hampered by political instability and wars in a number of countries.

Whilst most countries in the Americas have made major steps in integrating the traditional malaria control organizations into the general health services at the central level, the integration at the local level has been attempted in only a few such as Brazil, Colombia, Honduras and Nicaragua. This has been assisted by financial support from Sweden in Central America and from the World Bank in Brazil. This has also required several countries in the Region to revise their legislation to allow for the integration of services and to promote intersectorial collaboration. Three countries, Belize, Mexico and Suriname, have however decided to update their malaria control strategy according to different lines and principles.

All nine countries of the Western Pacific Region have defined their objectives, targets and strategies and eight of these are in the process of implementing an accelerated programme of malaria control activities. Malaria control has been made a major priority in Cambodia, the Lao People's Democratic Republic, Solomon Islands, Vanuatu and Viet Nam. The integration of malaria control with the strategy of primary health care varies in the Region in keeping with the way each country has developed its primary health care activities. Integration with the general health services exists in several countries but problems exist at the periphery where workers have difficulties in giving time to the necessary health education and preventive measures.

#### **Future Activities:**

Priority will continue to be given globally to malaria endemic countries of Africa as well as those identified for intensified support in each Region, as outlined in 5.1.1 above. The finalization of the selection of the particular countries and their exact number will be determined during Regional Meetings of Malaria Control attended by WHO Headquarters staff and representatives of international and bilateral agencies.

#### *5.1.2.3 Development of national capability for disease management*

#### **Objective:**

to strengthen the general health services and all other providers of health care in the community, including the private sector and within the family, to provide early diagnosis and prompt treatment to all those at risk.

#### *(a) Requirements for strengthening disease management*

The following are essential elements for the strengthening of disease management at the national level:

- the development and promotion of antimalarial drug policies within the framework of national drug policies;
- strengthening of diagnostic and treatment facilities for severe and complicated disease and the management of treatment failures;

- training of general health care workers of all categories in the management of malarial disease;
- training of health care providers within the community, including community health workers, mothers, drug-sellers, and private practitioners in correct health seeking behavior and the management of malaria disease;
- development of health education materials adapted to local cultures.

*(b) The development of antimalarial drug policies as a part of the national drug policy*

**Target:**

by the end of 1998, 80% of the countries have developed antimalarial drug policies based on WHO guidelines.

**Major Achievements:**

Guidelines for the development of antimalarial drug policies based on assessments of drug efficacy, effectiveness, safety, cost and quality have been developed by an informal consultation in March 1994 in collaboration with the Division of Drug Management and Policies, the Drug Action Programme and TDR (WHO unpublished document WHO/MAL/94.1070).

Operational research to support the development of drug policies and to manage malaria disease is also being carried out. For example:

- a study to analyze drug use practices and treatment-seeking behaviour at the community level in Kenya. This project, supported by ODA, will also identify the impact of HIV-AIDS overlap with malaria on drug utilization.
- the TDR/CTD Applied Field Research component has established a task force to support research on developing strategies for improving compliance to multidose antimalarials and to encourage consistent regional drug policies on artemisinin derivatives for the treatment of malaria in South-East Asia and Indochina.

**Future Activities:**

With support from the Swedish International Development Authority (SIDA), priority in 1995-96 will be given to:

- the dissemination of the guidelines on antimalarial drug policies;
- technical assistance to countries to develop their national policies, including workshops;
- support to operational research in developing and monitoring the policies;
- establishment of an interregional system for monitoring drug resistance in WHO's Regions of South-East Asia (SEAR) and Western Pacific (WPR), which was recommended as a priority activity by the Interregional Meeting on Malaria Control held in Kunming in November 1993.

(c) *Strengthening diagnostic and treatment facilities*

**Objective:**

to assist the general health services to improve diagnosis and treatment of malaria disease.

**Targets:**

by the end of 1997, 80% of the countries have adopted guidelines for diagnosis and treatment of malaria in accordance with WHO recommendations;

by the end of 1997, 80% of the countries have good referral facilities at the district level for severe and complicated cases of malaria;

by the end of 1999, laboratory diagnosis is available in 50% of health facilities;

by the end of 1999, 60% of health workers responsible for child care will have been trained in standard case management either at specific malaria or at sick child courses;

by the end of 1999, in 80% of affected countries the population at risk of malaria has access to affordable and adequate treatment.

**Major Achievements:**

Training modules and bench aids for malaria diagnosis and a practical handbook for the Management of Severe and Complicated Malaria, produced and distributed widely by the Training Unit of CTD in English and French.

Guidelines for the diagnosis and treatment of malaria in Africa are available (AFRO Technical Review Papers No 22 Rev 1., 1992).

Guidelines for the management of fever at the periphery have also been developed and are being field tested as part of the sick child initiative (under the direction of WHO's Division of Diarrhoeal Diseases and Respiratory Disease Control, in collaboration with the Division of Communicable Diseases, CTD/MAL, TDR, as well as UNICEF and USAID). A standard protocol for assessing the proportion of children presenting with febrile disease who suffer from malaria disease has been published and distributed (WHO unpublished document WHO/MAL/94.1069).

Training of district health teams in Africa in disease management has been carried out through the dissemination to all countries of a training guide and the organization of seminars for the training of trainers. Seminars have been organized in Benin, Burundi, Cameroun, Chad, Cote d'Ivoire, Ghana, Guinea, Liberia, Mali, Malawi, Mauritania, Nigeria, Rwanda, Zaire, and Zimbabwe. Also, over 20 district medical officers were trained in the management of severe and complicated malaria in Ghana in 1994.

Strengthening of the capability of primary health care workers to manage malaria disease is also being carried out by WPRO in Malaysia, Philippines, Solomon Islands, Vanuatu, and Viet Nam.

A workshop and training courses in the management of severe and complicated malaria were held in 1994 in Bangladesh, Ethiopia and Madagascar respectively.

Research on the development of new antimalarial drugs and on operational research to improve disease management is being carried out by TDR. For example, a new simple and quick antigen-based diagnostic technique for *Plasmodium falciparum* is being evaluated by TDR and SEARO in India, Malawi, Sri Lanka, Thailand and Venezuela. Field studies on malaria related anaemia in children are being carried out by TDR in Africa.

A joint SEARO/MAL/TDR meeting was held in the South-East Asian Region in March 1995 to review the new diagnostic technique for *P. falciparum* and to plan larger operational evaluations.

#### **Future Activities:**

Further training courses for district health workers will be carried out in 1995-96 in 11 countries of Africa and 6 countries of Asia and America. The strengthening of district health services in Ghana, Uganda and Zambia will be carried out through the production of health education materials, training of health care providers in the public and private sector, strengthening of laboratory services and the monitoring of drug sensitivity and local plans of action. This is being carried out with the support of ODA and the Malaria Consortium, UK.

Existing guidelines for the management of both uncomplicated and severe and complicated disease will be revised in 1995 and a training guide on the subject will be published and disseminated in 1995-96. These guidelines will also form the basis for locally adapted health education materials for the diagnosis and treatment of malaria at all levels of the health services and within the community.

A training programme for clinicians in the management of severe and complicated malaria will be finalized in 1995.

#### *(d) Improvement of self treatment within the community*

##### **Objectives:**

to gain a better understanding of how people perceive, prevent and treat malaria in the community to optimize treatment of malaria, both in the community and in the home, by a partnership between the health services and all other providers of health care.

##### **Targets:**

by the end of 1997, community based malaria control is being carried out in at least 5 African affected countries;

by the end of 1999, 80% of African national control programmes to be involved in integrated education and communication programmes for disease management in the community;

by end of 1999, 80% of health care providers in the home and the community are aware of the appropriate use of antimalarial drugs;

by the end of 1999, 25% of African affected countries have operational community based malaria control.

In many areas, government health services do not reach the communities at greatest risk of malaria and there is a wide range of alternative sources of health care, such as private practitioners, traditional healers, drug-sellers, family members. The population's perception of disease is one of the most critical factors in determining whether malaria will be treated quickly and effectively. Private-sector and self treatment, especially in rural areas are the rule rather than the exception, and will continue to be so. The health services have an important responsibility to educate communities in the risks of malaria, its proper treatment in the community and the use of the available services of care.

#### **Major achievements:**

The following materials for Health education have been or are nearing completion:

- A Manual for Community Health Workers produced by the Training Unit in collaboration with the Malaria Unit of CTD was completed in 1994 and is currently in press.
- A booklet providing information on the "The Treatment of Malaria" for non pharmacists selling antimalarial drugs at the community level has been developed and distributed (produced by the Training and Malaria Units of CTD).
- Comprehensive School Education - Guidelines for Action (produced in collaboration with UNESCO and UNICEF).
- A Video entitled " Do we still need to die of malaria?" emphasizing the need for people at risk to seek early diagnosis and prompt treatment was produced by WHO's Unit of Audiovisual and Programme Support.

A consultation to improve malaria case management through patient education was organized by AFRO in Brazzaville for representatives from the Congo, Madagascar, Côte d'Ivoire, Central African Republic and Zaire.

A large-scale project to strengthen rural health services ability to manage malaria disease through community participation in Tigray, Ethiopia, was initiated in 1994 with the support of the Italian Cooperation.

The first experience in the training of community health providers in disease management and of mothers in the identification of clinical predictors of malaria and the use of available health services commenced in Ghana in 1994.

#### **Future Activities:**

Health education training will be expanded in those countries identified for intensive support (see 5.1.1. above) and for which financial resources have been identified, e.g. Uganda and Zambia.

Guidelines for Health Education on Malaria Prevention and Control are being produced in cooperation with WHO's Division of Health Education and Health Promotion and a booklet

entitled " The Treatment of Malaria: Information for Pharmacists and Pharmacy Assistants" will be produced by the Training and Malaria Units of CTD in collaboration with the Drug Action Programme.

There are ongoing efforts in WHO to integrate educational materials on several diseases. This information is directed to specific target groups where the impact of educational activities will be greatest. Three WHO integrative programmes already involve malaria control: (i) the Healthy Women's Counselling Guide (under the direction of TDR with collaboration with the UN International Drug Control Programme and several bilateral agencies), (ii) the Sick Child Initiative (in collaboration with UNICEF and USAID) and, (iii) the Safe Motherhood Initiative (involving UNDP, UNICEF, World Bank, several NGO's and bilateral agencies).

Research on malaria-related knowledge, beliefs and behaviour will continually provide data that will be used for developing and health education methods and materials. CTD/MAL is cooperating in this area with TDR. Research is currently being undertaken by TDR in a number of countries on treatment-seeking behaviour of mothers for childhood malaria, and on communication channels through which families receive information on the management of malaria disease.

Experience gained from the community based malaria control project in Tigray, Ethiopia including those related to cost sharing will be used to used in 1996 to develop guidelines for the development of community based control activities in other priority African countries (see 5.1.1 above).

*5.1.2.4 Development of national capabilities for selective and sustainable preventive measures, including vector control*

**Objective:**

to assist and strengthen malaria control programmes and the community to implement the selective use of preventive measures including vector control, wherever they can be cost-effective and their impact on reducing mortality and morbidity can be sustainable.

*(a) protection of pregnant women from malaria*

**Targets:**

by 1998, 80% of malaria affected countries in Africa have adopted/updated and implemented their policies for the protection of pregnant women from malaria;

by 1999, there is a measurable reduction in primiparae of complications due to malaria in at least 5 African countries affected by malaria compared to 1996 data.

**Major Achievements:**

Controlled studies on new approaches to chemosuppression of malaria in pregnancy have been completed in Malawi by the National Malaria Control Programme in collaboration with CDC, Atlanta, USA. These new approaches have been reviewed by a WHO informal consultation on Antimalarial Drug Policies in 1994 and guidelines for further evaluations of these approaches issued.

**Future:**

Further evaluations of these approaches are planned in selected countries of Africa in 1995. This will require collaboration with other agencies and external financial support. Studies on the impact of sulfadoxine-pyrimethamine on malaria in pregnancy are being carried out, in collaboration with CDC Atlanta, TDR, and UNICEF, in Kenya.

**(b) Selective vector control**

Selective vector control involves the application of targeted, site-specific control methods that are cost-effective and where their impact can be sustained. Specific strategies and activities will be applied in different situations. Diverse epidemiological, ecological, social and economic characteristics will determine the nature and extent of selective preventive action. Thus, malarious areas will require to be carefully delineated to identify situations in which there is a priority need to resort to vector control and to select appropriate methods.

**Targets:**

by 1998, entomological staff are trained in selective vector control in at least 80% of malaria affected countries;

by 1999, the ability to target correctly selective vector control will be developed in all malaria control programmes.

**Major Achievements:**

A Study Group on Vector Control for malaria and other Mosquito-borne Diseases held in 1993 produced guidelines specific to the planning, implementation and evaluation of selective vector control, addressing issues of cost-effectiveness and sustainability. These guidelines developed at the global level have formed the basis for the development and revision of national control programme plans of action (see 5.1.2.2 above) and for training activities at international, national and district levels (see 5.1.2.1 above).

Workshops on the implementation of selective vector control have been held for anglophone African countries in Ethiopia and for francophone countries in Madagascar, involving the training of programme staff from Botswana, Burundi, Chad, Eritrea, Ethiopia, Madagascar, Namibia, and Mozambique, as well as from the Republic of Yemen.

WHO's policy on the use of DDT for malaria control has been updated in 1993, indicating that under certain circumstances it continues to be a useful tool for selective vector control. UNIDO is providing assistance to malaria endemic countries for the development and production of insecticides and biopesticides for mosquito control, including pilot plant production.

An analysis has been made of vector control activities carried out in 8 of the 9 countries of the South-East Asian Region, highlighting the implications for reorientation of vector control in the respective countries. Sites have also been identified to document experiences both in the implementation of selective vector control under different conditions, e.g. Myanmar, Solomon Islands, Sri Lanka and Malaysia, and for the development of epidemiological and managerial information systems.

Considerable progress has been made in the Eastern Mediterranean Region towards the development of mechanisms for health assessment of water sources development projects on vector borne diseases, particular malaria. Through the efforts of the Panel of Experts on Environmental Management for Vector Control (PEEM) in collaboration with FAO, UNEP and UNCHS, a series of guidelines on forecasting vector-borne diseases, on the incorporation of health safeguards in water resource development and on cost-effectiveness of vector control have created an awareness in health and planning sectors of Member States of the Region. Environmental management of disease vectors has been included in the curricula of health impact assessment courses in Pakistan and Morocco.

Much attention is being given to the use of impregnated materials as a form of personal protection against mosquito bites. Impregnated bednets have proved their efficacy in reducing morbidity and mortality in certain areas but more applied field studies have been required to evaluate their impact under different epidemiological conditions. The results of the TDR supported large-scale studies on the effect of impregnated bed-nets on childhood mortality will become available in 1995. Operational research is also being carried out on the social, behavioral and economic factors affecting the use of bednets and other personal protection methods, e.g. in India, Kenya (within the Bamako Initiative), Philippines and Tanzania, the results of which will be used for the production of locally adapted health education materials targeted to the community.

#### **Future Activities:**

Priority will be given in Africa, firstly to strengthening the capabilities for selective vector control in those countries with areas of epidemic potential, e.g. Burundi, Ethiopia, Madagascar and Namibia, and secondly to those countries with reasonably developed malaria control programmes (see 5.1.1 above). The priority in the rest of the world will be to assist countries to reorientate their existing activities towards the principles of the selective use of methods for vector control.

Guidelines will be developed on (a) selective vector control and (b) the monitoring of insecticide resistance and its management.

A Study Group will be held in collaboration with TDR in November 1995 to review the experience in research and the operational use of impregnated bednets and to provide guidelines for their use in malaria control.

Guidelines, targetted for community health workers, will be developed for both the implementation of community-based prevention measures and health education of the population. These will be delivered as part of primary health care. WPRO plans to evaluate during 1995 the utilization of health care workers to carry out selective vector control activities in two provinces in the Lao People's Democratic Republic.

The cooperation between malaria control and PEEM will be strengthened by involvement in the following PEEM activities: regional workshops on cost-effectiveness of vector-borne disease control, the development of guidelines for urban environmental management for vector control, training modules on disease control for engineers in water resource development, and research related to rice ecosystem management for disease vector control in Asia, urban environmental management, and the development and promotion of environmental engineering interventions for the control of *Anopheles sudaicus* in South East Asia.

5.1.2.5 *Development of national capacity for malaria control in epidemics and emergencies*

**Objectives:**

to strengthen national capacities to detect early, contain and prevent epidemics in prone areas and to react timely in emergency situations.

**Targets:**

by the end of 1996, 80% of epidemic prone countries have developed emergency plans of action;

by end of 1998, 80% of epidemic prone countries implement plans for the prevention and control of epidemics;

by end of 1999, all epidemic prone countries develop a capacity for forecasting, prevention and control of epidemics.

**Major Achievements:**

An epidemic response team was established in the malaria unit in 1990. Interagency and interregional cooperation has been an essential part of its response to malaria emergency situations during 1993-4 in Bangladesh, Burundi, Djibouti, Eritrea, Ethiopia, Iraq, Madagascar, Namibia, Rwanda, Somalia, Tadjikistan and Turkey, and particularly to control malaria among the refugees from Rwanda in Burundi, Tanzania and Zaire. These activities, dependant on the situation, have involved many different agencies and NGOs including UNDR0, UNHCR, UNHCR, and UNICEF.

**Future Activities:**

Based on the above experiences, CTD/MAL is developing guidelines on malaria control both in refugee camps and in epidemic situations. These should be available in 1995. Operational research to assist in the establishment of epidemic early warning systems will be promoted in South-East Asia and other Regions.

As a result of increasing requests for help in epidemic and emergency situations the activities of the malaria epidemic response team will be incorporated in to a CTD Epidemics Action Programme (CTD/EAP) to be eventually linked into the proposed WHO Early Warning and Health Emergency Information System. CTD/EAP will function in close collaboration with the CTD documentation Centre and the geographical information systems facility in the Division. It will support other WHO Divisions involved with other epidemic diseases and emergency actions and will benefit from special international communications services to ensure that incoming requests for assistance are received without delay and given immediate attention.

The mechanisms for early detection of epidemics remain weak. The ability of the countries themselves to detect and react to such situations depends on the development of relevant epidemiological and managerial systems (see below 5.2) and, in most situations, on the mobilization of additional human and financial resources. It must be recognized that such emergency action is often required in conditions of war and civil disturbances where a countries

health infrastructure are destroyed. This places added responsibilities on external organizations and highlights the necessity for coordinated action by all involved.

## 5.2 Programme Management and Surveillance

### Objectives:

to assist countries with the establishment of new epidemiological and managerial information systems and in the evaluation of existing ones;

to provide control programmes and the international community with up to date, relevant information on the status of malaria and its control in the world.

### Targets:

by 1997, at least 50% of countries affected by malaria have developed epidemiological and managerial information systems according to regional guidelines;

by 1997, at least 90% of countries report annually to WHO on their malaria situation and on the status of the implementation of the Global Strategy.

### Major Achievements:

Guidelines for the establishment of epidemiological and managerial information systems have been developed giving priority to estimating malaria as a disease rather than an infection and taking into account social, economic and development factors which affect malaria and its control. These have been modified according to regional needs and are being disseminated to the country level as well as being incorporated into training programmes for programme managers at the central and district levels.

Monitoring malaria risk, drug resistance and adverse reactions to drugs is routinely carried out globally and forms the basis for the annual reporting of the global malaria situation in the WHO Weekly Epidemiological Record and for health advice to travellers to malaria endemic areas, published annually in International Travel and Health: Vaccination Requirements and Health Advice.

Since 1990, adverse reactions to mefloquine have been actively monitored in collaboration with the manufacturers and a system to monitor those to artemisinin derivatives was established in 1993-94 in Thailand in collaboration with the Thai Food and Drug Administration.

Standard WHO *in vivo* tests to measure drug susceptibility have been revised and simplified to measure clinical and not just parasite response to drugs. Guidelines on carrying out this new test are given in the report of the informal consultation on Drug Policies (see 5.1.2.3 (a) above). Standardized *in vitro* test kits to measure the susceptibility of *P. falciparum* to chloroquine, amodiaquine, quinine, mefloquine and sulfadoxine-pyrimethamine combinations continue to be made available at cost price through the Regional Office for the Western Pacific.

A country profile data base has been established to monitor the status of the implementation of Global Malaria Control Strategy and funding of malaria control.

The programme for monitoring insecticide resistance to disease vectors that ensures the availability of standardized test systems and test kits at the country level is being restructured. Test kits obtained through WHO are now prepared and despatched by the Universiti Sains Malaysia. Studies have been initiated to develop a system for the detection and monitoring of resistance to the pyrethroid group of insecticides, that are being used for impregnating materials for personal protection and for house spraying. The data base on insecticide resistance is being updated.

#### **Future Activities:**

Priority will be given to strengthening of epidemiological and managerial information systems at the national level within the context of support to individual countries selected as outlined above (see 5.1.1) and to surveillance in epidemic-prone areas, with particular emphasis on the coordination of these systems both within the national health services and between countries facing similar situations.

An interregional monitoring system on drug resistant malaria will be established between countries of SEAR and WPR with the support of SIDA (see also 5.1.2.3 (b))

The activities for global monitoring outlined above will be continued with emphasis on improving the timeliness of reporting.

### **5.3 Coordination**

#### **Objective:**

to stimulate partnership of all interested parties in malaria control and to ensure the implementation of common policies, continuity of action and the accountable and optimal use of resources for malaria control at both international and national levels.

#### **Target:**

by the year 1997, at least 50% of countries affected by malaria implement plans of action for malaria control that coordinate the activities of all major partners involved in malaria and its control.

#### **Coordination is required:**

- between agencies and organizations supporting countries
- between endemic countries sharing problems
- between public health programmes at national and international levels
- between health services and other sectors, both governmental and private, whose activities relate to malaria and its control.

Such coordination is required at local, national, regional and international levels. This section highlights general areas of coordination and cooperation between agencies. The detailed contributions and the collaboration of other agencies, including those of other WHO programmes, are also highlighted in the respective sections above.

### **Major Achievements:**

#### **At the international level**

Many multilateral, bilateral and nongovernmental organizations and institutions have acquired considerable experience in malaria control and, during the process of the development and implementation of the Global Strategy, have shown their willingness to take part in team work for malaria control at all levels.

The Global Strategy has now been formally endorsed by both the World Health Assembly in 1993 and the General Assembly of the United Nations in 1994, calling for WHO to reinforce its leadership role in malaria control and for the strengthening the coordination between UN agencies in the field, as recommended by the Economic and Social Council(ECOSOC) of the United Nations.

Meetings of Interested Parties in Tropical Disease Control including malaria have been held in 1993 and 1994, involving UN agencies, NGOs and bilateral agencies to provide a global forum for exchange of technical information and priority setting at global, regional and country levels, to review WHO's plan of work and its financial and managerial aspects in relation to other related programmes both within and outside the organization.

The Joint Committee on Health Policy, composed of members of the Executive Boards of WHO and UNICEF continue to review global policies and collaborative activities at least every two years.

Joint reviews of national programmes with other multi- and bilateral agencies continue to be carried out. Examples of such activities in 1994 are the review of the vector borne disease control programme in Nepal involving WHO, USAID, CDC, Atlanta, DANIDA and JICA, and of the malaria control programmes in Madagascar and the Lao People's Democratic Republic by the World Bank and WHO, and of Viet Nam by AIDAB, the World Bank and WHO (see also section 5.1 above).

A joint UNESCO/WHO technical meeting on Combatting malaria was held in 1994, at which it was agreed that the two organizations would increase collaboration, particularly in the areas of national capacity building and health education for malaria control.

#### **At the regional level**

Regional Working Groups on Malaria Control have been organized during 1993-94 in all 5 Regions in which malaria is endemic to review country support, training, research activities and communication to further the implementation of the Global Strategy. These meetings are attended by national malaria control staff, regional experts and invitations are sent to all international agencies, major NGO's, bilateral agencies and international banks active in the specific regions. Interregional and intercountry collaboration is being promoted, particularly

where countries share problems and control opportunities, multidrug-resistance problems in countries of the South-East Asia and Western Pacific Regions being a notable example.

CTD/MAL and AFRO staff have participated as technical facilitators in UNICEF malaria network meetings held in Kenya in 1993 and in Tanzania in 1994.

#### **At the national level**

The national response to the Global Strategy has been positive. Political commitment has been voiced by virtually all and some have already demonstrated this commitment by increasing malaria control budgets, creating coordination mechanisms and attracting substantial external funding. Interagency and intersectoral coordination at the national level is an essential element for the implementation of the Global Strategy, but this requires a basic framework of cooperation in each country.

The starting point, in many cases, has been the development of national plans of action for malaria control by the national programme with inputs from WHO and locally active other international and bilateral agencies. For example, WHO is collaborating with UNICEF at regional and country levels to strengthen the malaria control programmes in Eritrea, Namibia, Tanzania and Uganda, with UNDP in Myanmar, and with the World Bank in Bangladesh, Laos People's Democratic Republic, and Viet Nam and, for possible future support, in India.

In many others, however, major external investments are still needed to overcome the current restraints to implementation and there is still a major challenge for coordination of malaria control at the national level. Coordination between the various national sectors who have a role to play in control is often hampered by the local managerial infrastructure. Strengthening of this capacity is generally a shared goal of international organizations and bilateral donors and requires consensus in promoting and supporting the development and implementation action of national plans for malaria control.

In many countries, however, national programmes, even those well integrated with the general health services are still reluctant to assume full responsibility for its intersectoral coordination and act as advisers on preventive measures to be executed by other institutions, mainly in the social and economic development sectors. Often the health sector itself is in constant transformation and restructuring, leaving little energy for preventive action.

#### **Future Activities:**

Priority will be given to strengthening the national capacities for coordination at the local level in those countries who have been identified for more intensified country support (see 5.1.1 above). This will include working with programmes involved in health infrastructure development, other sectors involved in malaria and its control, UN organizations, NGO's and bilateral agencies in order to maximize support, avoid duplication and ensure better coordination.

Meetings of Interested Parties are planned to take place biannually whilst Regional Working Groups/Task Forces on Malaria Control will take place annually.

Discussions have recently been initiated between WHO and the World Bank for support to malaria control in the tribal areas of India.

Coordination between WHO Headquarters and Regional Offices will be strengthened to promote joint planning and review of country activities.

A meeting to review the implementation of this Action Plan will be held with the World Bank and other international agencies in 1995 and a meeting of the Expert Committee on Malaria is planned for 1996-97 to review the status of the implementation of the Global Strategy.

## 6. RESOURCES

The appropriation of funds by Ministries of Health for malaria control varies from one country to another, depending on the magnitude of the problem, but primarily due to economic considerations. Most of the African countries are classified in the low economic development group and are going through major economic crises. As a consequence, the budget allocations for health are being trimmed steadily. Thus, even though malaria is recognized as a major health problem that impedes economic development, the scarcity of funds has prevented most Ministries of Health from launching effective programmes without major external assistance.

Many countries have, however, shown increased commitment towards strengthening malaria control programmes by supplementing external assistance and mobilizing additional national resources, e.g. Ethiopia (US\$ 8-11 million for 1994), Ghana (US\$ 5-8 million), Namibia (US\$ 2-4 million), and Zimbabwe (US\$ 6 million).

At present, the majority of the African countries are not involved in vector control activities but rely on disease management through the health services and community-based interventions. The cost of malaria in most of these countries represents an average of 10% of the total public expenditure on health. Thus, an African country with an average population size of 5 million and with an annual health budget of US\$ 24 million is expected to spend about US\$ 2,400,000 per year on the management of malarial disease, i.e. US\$ 0.48 per person per year. This cost covers primarily the payment of salaries for nationals involved in malarial disease management and for a limited supply of antimalarial drugs.

Since the coverage of the public health services is as low as 40% in most countries, a significant number of malaria patients obtain treatment outside the formal health services and the expenditure by the population on malaria treatment exceeds that of the public services. A survey carried out in Africa has shown that the population spends between US\$ 2.5 and US\$ 3.0 per person per year on malaria treatment with chloroquine and/or sulfadoxine-pyrimethamine combinations. This cost will be much higher if other antimalarial drugs such as halofantrine or mefloquine are used. At the moment, the prevailing estimated cost of mefloquine treatment is about US\$ 7. In addition to the cost of antimalarial drugs, it is also estimated that the population spends at least US\$ 2.0 per person per year on personal protection against mosquitos. Shepard *et al.*, (*Tropical Medicine and Parasitology*, 42, Suppl. 1, 199-203, 1991), who carried out an extensive analysis on the economic impact of malaria in Africa, estimated the direct and indirect cost of a case of malaria to be US\$ 9.84 for countries in Africa south of the Sahara.

The present level of national resources allocated to malaria control programmes by the endemic countries does not match with the programme needs and thus is inadequate for undertaking effective and sustainable control programmes.

However, an increasing number of countries have prepared detailed and comprehensive plans of actions for malaria control based on the principles of the Global Strategy. The planned activities include:

- training of health workers at all levels of the health care system on management of malarial disease;
- strengthening of diagnostic facilities for the management of severe cases and treatment failures;
- training of community health agents and drug vendors at the periphery on malaria diagnosis, treatment and correct prescription;
- development and use of health education materials targeted at the health workers, mothers and the general population;
- introduction of insecticide-impregnated bednets whenever suitable;
- strengthening of the routine epidemiological information system for assessments of local trends of malaria, the efficacy of antimalarial treatment, and the detection of malaria outbreaks and epidemics.

The cost of this "package" of basic essential activities (excluding vector control) is estimated to be US\$ 300 000 per year per country, or US\$ 14 million per year for all countries or areas in the region. In most cases in Africa, these costs cannot be covered from by national budgets and will require external funding.

An increasing number of epidemic outbreaks occur in Africa for which not only is an information system to detect them required, but also the capability of control including vector control. Several of these epidemic-prone countries finance their respective malaria control programmes, including the cost of insecticides from their national budgets.

Summarized costs for the various components of malaria control in Namibia and Ethiopia with populations of 1.5 and 51 million respectively are presented in Tables 1 and 2 below.

Table 1. Costs of malaria control in Namibia

<b>1. General</b>		
Total population		1,500,000
Population at risk of malaria		900,000
<b>2. Budget</b>		
Total budget of Ministry of Health	US\$	24,300,000
Budget allocated to Malaria Control Programme (7% of total Ministry of Health's budget)		1,744,000
Malaria Control Programme cost per person per year		1.9
<b>3. Cost of major components of Malaria Control Programme</b>		
Antimalarial drugs		664,000 (38%)
Insecticides		365,000 (21%)
Personnel and operational costs		715,000 (41%)
<b>Total Malaria Control Programme budget</b>		<b>1,744,000 (100%)</b>

Table 2. Costs of malaria control in Ethiopia

<b>1. General</b>		
Total population		51,000,000
Population at risk of malaria		35,000,000
<b>2. Budget</b>		
Total budget of Ministry of Health	US\$	95,840,000
(a) Malarial disease management through general health services		5,690,000
(b) Direct appropriation to Malaria Control Programmes		5,500,000
Total for malaria (12% of total Ministry of Health budget)		11,190,000
Malaria Control Programme cost per person per year		0.32
<b>3. Cost of major components of Malaria Control Programme</b>		
Antimalarial drugs		1,522,000 (13.6%)
Insecticides		1,134,000 (10%)
Personnel and operational costs		8,534,000 (76%)
<b>Total Malaria Control Programme budget</b>		<b>11,190,000 (100%)</b>

The public expenditure on malaria *per capita* is about US\$ 0.32 in Ethiopia; quite low as compared to that of Namibia and Botswana, which is about US\$ 1.9 and US\$ 1.4 respectively. Thus, in spite of Ethiopia's significant input into the national malaria control, the funds are inadequate to provide meaningful protection to a population of 51 million.

It is estimated that an additional input of US\$ 1 million per year would be required for each country to carry out a comprehensive, effective and sustainable programme, including a capacity for selective vector control. About 12 countries in Africa, in particular the ones with epidemic-prone areas, will be able to implement cost-effective disease management and prevention measures, given similar inputs for capacity building.

It could thus be estimated that the external investments in malaria control in Africa within this decade should be approximately US\$ 14 million per year for undertaking basic programme activities related to disease management and an additional US\$ 12 million per year for comprehensive control activities, including epidemic control, or a total of US\$ 26 million per year. These costs do not include short-time technical assistance or training of specialized staff at international courses, but do include in-country training and operational research.

The external support of the US\$ 26 million per year to national control programmes in Africa could be secured through bilateral or multilateral arrangements. WHO will provide, within the limits of its resources, technical support as required.

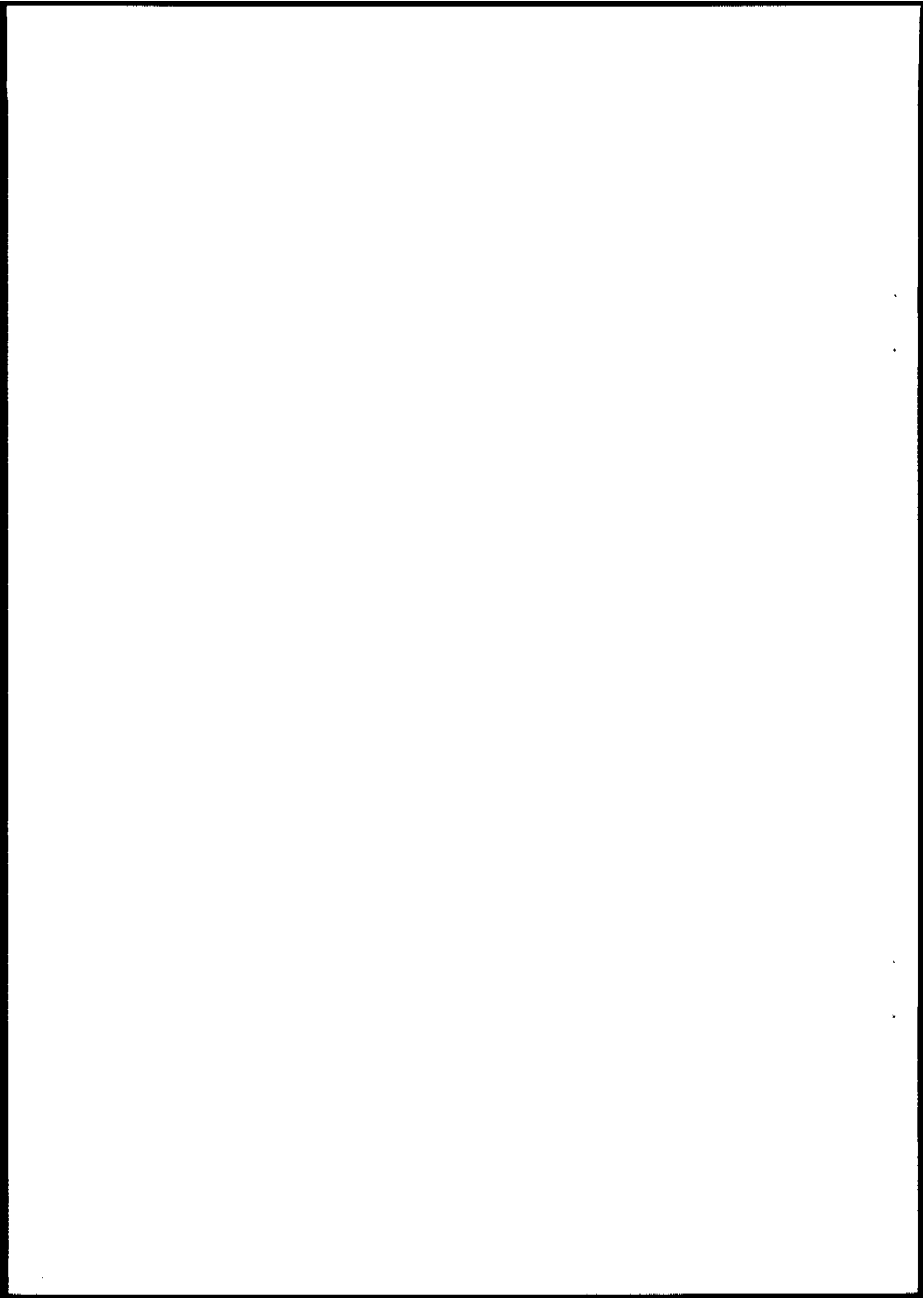
The total population at risk outside Africa is approximately 1 750 million people. In these areas, countries are also showing an increased commitment towards strengthening malaria control programmes by mobilizing additional national resources, e.g. Solomon Islands (US\$ 0.8 million) and Viet Nam (US\$ 0.8 million). In the latter case, Viet Nam in collaboration with WHO, has recently planned a national programme covering a population at risk of approximately 40 million. This programme, based on epidemiological criteria and analysis, will cost approximately US\$ 10 million per year to be covered by national and external sources, including the Australian International Development Assistance Bureau (AIDAB) and the World Bank. The Overseas Development Administration has provided US\$ 1.3 million to Cambodia and additional funding is planned through 1998.

Probably the largest of all national programmes is that of India with an annual budget of US\$ 73 million per year, covered mainly from national sources and loans. The Government of India has also increased the political commitment to malaria control by increasing this budget by an additional 37% in 1995. This programme covers an estimated population at risk of 800 000 000.

It would therefore seem that, in countries outside Africa, malaria control programmes which include, like Ethiopia, a capacity for disease prevention, have a public cost of US\$ 0.10-0.25 per person at risk per year, i.e. between US\$ 175 million and 350 million per year. This cost should, however, decrease during the coming decade as a result of:

- increased financing by users, e.g. through increased reliance on personal and community-based measures;
- social and environmental stabilization leading to decreased malaria risk;
- the selective use of transmission control activities where the results can be cost-effective and sustainable.

One of the preconditions for the first and third of these events is reorientation and strengthening of national programmes. Ensuring this, will require capacity building and external investments in malaria control independent of the current external support which is mainly used to support the acquisition of commodities. It would be reasonable to estimate that the new external investments required should be approximately 10% of the current public expenditures, or US\$ 20-35 million per year.



## Annex 1. SUMMARY OF ACTION PLAN FOR MALARIA CONTROL: TIMETABLE OF MILESTONE STEPS

*Global targets for the year 2000:  
malaria mortality will have been reduced by at least 20% compared to 1995 in at least 75% of affected countries*

Programme Elements		1995	1996	1997	1998	1999
I. Development of national capabilities for:	(i) <u>Planning and evaluation of malaria control</u> (involving UNICEF, World Bank, UNDP, European Commission and bilateral agencies).	Continuation of training programme managers with emphasis on district level		80% of African a.c. have functional programmes with managers trained in malaria control		
	(a) Planning	80% of African a.c. have formulated updated plans of action based on analysis of epidemiological situation		All endemic countries outside Africa have reoriented their national control programmes		
	(b) Implementation	50% of a.c. implement national plans of action	70% of a.c. implement national plans of action	90% of a.c. implement national plans of action		

a.c. = affected countries (i.e., where malaria is an important public health problem)

Programme Elements		1995	1996	1997	1998	1999
(ii) Disease Management	(a) Antimalarial Drug Policy (with SIDA and Netherlands cooperation)	Update of guidelines on artemisinin derivatives		In 50% of a.c. appropriate national antimalarial drug policy implemented	In 80% of a.c. national drug policy implemented in 50% of a.c. the population has access to affordable, adequate treatment	In 80% of a.c. the population in all areas has access to affordable and adequate treatment
	(b) Facilities (all sick child related activities with UNICEF and USAID)	Training of district health teams on disease management (involving many bilateral agencies)	Development of training course on integrated inpatient care of the sick child	In 80% of a.c. district health teams trained on disease management Field test of course on integrated inpatient care of the sick child Development of training materials on integrated management of the sick child for medical and paramedical schools		In all a.c. district health teams trained on disease management
		Inter-country and national courses for trainers on case management of sick child			60% of health workers responsible for child care trained in standard case management either at malaria or sick child courses	
		Courses on case management for health workers responsible for child care				

Programme Elements		1995	1996	1997	1998	1999
		Field studies on new diagnostic tools (involving UNDP and World Bank)	Guidelines on use of new diagnostic tools		Cost-effective diagnostic tools routinely used in at least 25% of a.c.	Laboratory diagnosis available in 50% of the health facilities
		Training on management of severe malaria for medical doctors in general health services and private sector (involving bilateral agencies)				
		Field research in malaria and anaemia (involving UNDP and World Bank)		Control of malaria associated anaemia incorporated in at least 25% of the a.c.	Control of malaria associated anaemia incorporated in at least 50% of a.c.	Control of malaria associated anaemia incorporated in at least 80% of a.c.
		Guidelines on control of malaria associated anaemia				
	(c) Community (involving UNDP, UNESCO, UNICEF, World Bank, bilateral agencies and NGO's)	Training of community health workers (CHW) and health care providers on malaria diagnosis and treatment		Community based malaria control established in at least 5 African a.c.		25% of African a.c. have operational community based malaria control
		Controlled studies in Africa on cost-sharing management of malaria at the community level				
			Guidelines to implement effective malaria control at the community level in Africa		Revision of guidelines on malaria control at the community level in Africa	

Programme Elements		1995	1996	1997	1998	1999
		Operational research on treatment seeking behaviour in the community	Training of mothers on home treatment		50% of malaria programmes in African a.c. involved in health education and communication	80% of malaria programmes in African a.c. involved in health education and communication
		Training of drug vendors at the peripheral level on antimalarial drugs				
(iii) <u>Selective and sustainable preventive measures</u>	(ia) Chemo-suppression in pregnancy (involving UNDP, World Bank, CDC)	Controlled studies on new approaches to chemosuppression in pregnancy	Guidelines on protection of pregnant women in highly endemic areas	In 50% of African a.c. guidelines on protection of pregnant women are implemented	In 80% of African a.c. guidelines on protection of pregnant women are implemented	Measurable reduction in proportion of complications due to malaria in primiparae in at least 5 African a.c.
	(b) Selective vector control (involving PEEM, UNIDO, FAO, UNEP, UNCHS, World Bank and several bilateral organizations, including the Netherlands and France)	Training in selective vector control	Training in selective vector control	Updated guidelines on selective vector control	Entomological teams trained in selective vector control in at least 80% of a.c.	Vector control targeted correctly in all countries
		Revised guidelines on selective vector control				
		Resume database on insecticide resistance	Draft guidelines on management of insecticide resistance	Informal consultation on insecticide resistance and its management	Update guidelines on management of insecticide resistance	

a.c. = affected countries (i.e., where malaria is an important public health problem)

Programme Elements		1995	1996	1997	1998	1999
	<p>(iv) <u>Malaria control in epidemics and emergencies</u></p> <p>(involving European Commission, Italian Cooperation, ODA, UNDP, UNHCR, UNICEF, NGO's and other bilaterals)</p>	<p>Improved test to detect for resistance to pyrethroids</p>	<p>80% of epidemic prone countries have an emergency plan of action</p>	<p>80% of epidemic prone countries implement plans for prevention and control of epidemics</p>	<p>Monitoring of resistance to pyrethroids</p>	<p>All malaria epidemic prone countries develop capacity for forecasting, early prevention and control of epidemics</p>
		<p>Guidelines on early warning and forecasting for epidemics</p> <p>Guidelines on malaria control in refugee camps</p>	<p>Preparation for 20th Expert Committee on Implementation of Global Strategy</p>	<p>20th Expert Committee on Implementation of Global Strategy</p> <p>50% of a.c. developed epidemiology and managerial information applied accordingly to regional guidelines</p>	<p>In 80% of all a.c. surveillance is fully integrated in general health services</p>	<p>In all a.c. surveillance is fully integrated in general health services</p>
	<p>(v) <u>Programme management and surveillance</u></p>	<p>Establishment of comprehensive country profiles on malaria of all a.c.</p>	<p>Guidelines on use of impregnated bednets</p>	<p>25% of malaria control programmes have access to insecticide impregnated materials</p>	<p>Updating country profiles</p>	<p>50% of malaria control programmes have access to insecticide impregnated materials</p>
<p>II. Research and development on selective and sustainable protection methods</p>	<p>(i) <u>Personal protection</u></p> <p>(involving UNDP, UNICEF, World Bank and several bilateral agencies and NGO's)</p>	<p>Conclusion of TDR bednet studies in Africa</p>	<p>Guidelines on use of impregnated bednets</p>	<p>25% of malaria control programmes have access to insecticide impregnated materials</p>	<p>Updating country profiles</p>	<p>50% of malaria control programmes have access to insecticide impregnated materials</p>

a.c. = affected countries (i.e., where malaria is an important public health problem)

Programme Elements		1995	1996	1997	1998	1999
		Study group meeting on operational applications of bednets in Africa				
	(ii) Vaccines (involving European Commission, UNDP, UNIDO, World Bank and bilaterals agencies, including USAID)	Completion of SPf66 malaria vaccine trials in Columbia, The Gambia and Thailand  Review meeting on SPf66	Operational research on SPf66			Introduction of malaria vaccines on operational scale
III. Coordination	(i) National level  (involving all interested parties)	Initiation of Phase I of other candidate vaccines		Phase II trials of other vaccines		
	(ii) Global and Interregional  (involving all interested parties)	Interagency agreement on Action Plan for Malaria Control 1995-2000  Preparations for World Bank malaria projects in at least 5 countries of WHO Regions	Meeting of Interested Parties on Malaria Control	At least 50% of a.c. have developed mechanisms for coordination of activities with partners in malaria control	Meeting of Interested Parties on Malaria Control	50% of development projects in a.c. incorporate malaria prevention and control
		Joint policy agreements for malaria control with international and regional organizations				

a.c. = affected countries (i.e., where malaria is an important public health problem)

## Annex 2.

## Principal Documents and Training Materials Produced by WHO

(English)

A. DOCUMENTS	Existing	Under development
Title		
Report of the WHO 18th Expert Committee on Malaria	X	
Report of the WHO 19th Expert Committee on Malaria	X	
Practical Chemotherapy of Malaria	X	
Global Malaria Control Strategy	X	
Ministerial Declaration on Malaria Control	X	
Guidelines for Implementation of Global Strategy	X	
Guidelines for the Diagnosis and Treatment of Malaria in Africa	X	
Strategies for Malaria Control in the African Region and Steps for their Implementation	X	
Information Systems for the Evaluation of Malaria Control Programmes	X	
Report of Study Group on Vector Control for Malaria and other Mosquito-borne Diseases	X	
Antimalarial Drug Policies: Data Requirements, Treatment of uncomplicated Malaria and Management of Malaria in Pregnancy	X	
The Role of Artemisinin and its derivatives in the current treatment of Malaria (1994-1995)	X	
A Standard Protocol for assessing the proportion of children presenting with febrile disease who suffer from malarial disease	X	
Guidelines for cost-effectiveness analysis of Vector Control (PEEM)	X	
Treatment seeking for malaria: a review and suggestions for future research (TDR)	X	
Qualitative research methods: Teaching materials from a TDR workshop (TDR)	X	
A Manual for the use of Focus Groups (TDR)	X	
Community Participation and the Control of Tropical Diseases (TDR)	X	

<b>B. TRAINING MODULES</b>		
Title	Existing	Under development
Basic Malaria Microscopy	X	
Entomological Field Techniques	X	
Malaria - A Training Guide for District Health Workers on Malaria Control in Tropical Africa	X	
Malaria Control at the District Level	X	
Entomological Laboratory Techniques (trial edition)	X	
Basic Epidemiology and Simple Statistics	X	
Teaching Skills Development for Disease Control Workers	X	
The Management of Severe and Complicated Malaria at the Hospital Level	X	
The Epidemiological Approach to Malaria Control	X	

<b>C. TRAINING MANUALS</b>		
Title	Existing	Under development
Management of Severe and Complicated Malaria - A Practical Handbook	X	
A Manual for Community Health Workers (in press)	X	
The Treatment of Malaria - Information for non-pharmacists selling drugs	X	
The Treatment of Malaria - Information for pharmacists and pharmacy assistants		X
Manual for Tropical Diseases Control at the Primary Health Care Level		X

<b>D. TRAINING AIDS</b>		
Title	Existing	Under development
Bench Aids for the Microscopic Diagnosis of Malaria	X	
Video on the Biology of Anopheline Mosquitos	X	
Video on Basic Mosquito Taxonomy and Field Techniques	X	
Video on Malaria Entomology in Laboratory Techniques	X	
Video entitled Malaria	X	
Video on Bednets that Kill Mosquitos	X	
Video on Parasitology of Malaria	X	
Videodisc Interactive Programme on the Global Malaria Control Strategy		X
Interactive computer programme on the Management of Severe Malaria	X	
Interactive computer programme on Malaria Control at the District Level	X	
Charts on Management of the Sick Child	X	
Basic Malaria Microscopy	X	