CONSULTATION ON EPIDEMIOLOGICAL MALARIA INFORMATION AT NATIONAL AND REGIONAL LEVELS

Amman, Jordan, 25-30 November 1989

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1. INTRODUCTION

A Consultation on Epidemiological Malaria Information at National and Regional Levels was convened in Amman, Jordan, from 25 to 30 November 1989.

The objectives of this Consultation were to improve information and reporting systems on malaria at different national levels, to provide guidelines for the development of formats to be utilized by the various countries of the Region, thus enabling a better understanding of the epidemiological situation regarding malaria, and to ensure that information received at central level in each country will meet the minimum requirements for proper planning, implementation and evaluation of malaria programmes.

2. OPENING SESSION

The meeting was opened by H.E. the Minister of Health and Social Development in Jordan, Dr Zuhair Malhas. He welcomed the participants to the Consultation and wished them a pleasant stay in Amman. He emphasized the importance of coordination of activities and exchange of information among neighbouring countries and the need to strengthen surveillance mchanisms, particularly in countries like Jordan where a malaria-free status has been achieved. A message from Dr Hussein A. Gezairy, Regional Director of the Eastern Mediterranean Region was read to the participants by Dr A.M. Abdul Hadi, WHO Representative, Jordan.

In his message, Dr Gezairy stated that the changes in, and evolution of the malaria programmes in the different countries of the Region have resulted in the establishment of different information systems. Some countries continue to adopt a vertical approach to programme information systems, others have horizontally integrated programmes and rely fully on primary health care statistical information, while a third group maintains a dual system of information gathering, one under malaria and another under primary health care. Information is required for planning, implementation and evaluation of the antimalaria programmes. There are different categories of country in the Region for each of which different kinds of information will be required. For this purpose, the global policies, recent advances and available technologies for malaria control have to be reviewed. Epidemiological objectives and targets have to be developed according to each epidemiological situation. The amplitude and complexity of data collection and processing inevitably vary according to the different objectives and targets of the programmes.

Dr Mohammad Rida Tawfik (Jordan) was elected chairman of the meeting, Dr A.R. Aqeel (Saudi Arabia) was elected vice-chairman and Dr Amin Al Haq (United Arab Emirates) was elected rapporteur. The meeting was attended by representatives from ten countries of the Region. The list of participants is attached as Annex I. The agenda (Annex II) and the programme of work were adopted as proposed.

3. REVIEW OF THE INFORMATION AND REPORTING SYSTEMS IN DIFFERENT EPIDEMIOLOGICAL SITUATIONS IN THE REGION

The countries of the Eastern Mediterranean Region can be divided into three groups.

(a) Nine malaria-endemic countries with nationwide malaria control programmes.

This group of countries comprising Egypt, Islamic Republic of Iran, Iraq, Morocco, Pakistan, Oman, Saudi Arabia, Syrian Arab Republic and the United Arab Emirates, can be further divided into two categories:

- countries with vertical programmes and information systems;

- countries where the responsibility for malaria control is shared between the vertical malaria programme and the general health services based on primary health care. In this group of countries there are different systems of information which have been inherited from the eradication campaign, or which are a recent development within the emerging PHC information system or which are a mixture of both systems.

It is believed that the information available and utilized in most countries is not sufficient for the proper planning, implementation and evaluation of the programmes. Furthermore, in many of these countries, self-treatment of malaria or treatment through the private sector is estimated to account for more than 50% of the total malaria cases. In particular, information on mortality, severe cases, treatment facilities, cases of adverse reaction to antimalarial drugs, the magnitude of the problem of chloroquine resistance and other important parameters for programme development are lacking.

(b) Six malaria-endemic countries with no nationwide malaria programmes.

This group comprises Afghanistan, Democratic Yemen, Djibouti, Somalia, Sudan and Yemen. Approximately 50% of the population at risk in these countries is not protected by any malaria control measure either through the general health services or the malaria programmes. In this group of countries the data collected are not considered sufficient for the planning or execution of control activities. It may also be noted that the 50% that is unprotected suffers more greatly from the disease and is exposed to an epidemiologically higher risk than is the rest of the population.

(c) Eight countries which are considered to be malaria free.

This group comprises Bahrain, Cyprus, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Qatar and Tunisia; the eastern part of Saudi Arabia can also be included. This group of countries can be divided into three categories:

- countries which were originally free from malaria (Kuwait) or from which malaria disappeared spontaneously with social and economic development (Bahrain and Qatar);

- countries where control measures are continuously applied to maintain a malaria-free status (Jordan);

- countries where there is a potential risk of the re-establishment of malaria transmission. These countries depend mainly on vigilant border activities (Libyan Arab Jamahiriya and Tunisia).

The countries in this group differ widely in their information requirements and systems. In the first category, the data collected are limited to the number of microscopically confirmed cases, including certain details such as age, sex, origin, species, etc. In Jordan, an extensive data collection system continues to be maintained having been developed for the attack and consolidation phases of malaria eradication. In the third category, information on imported cases that have been detected is available. However, relevant information on areas where there is a high risk of re-establishment of transmission is lacking.

4. INFORMATION ON MALARIA CONTROL AT WHO REGIONAL AND GLOBAL LEVEL

4.1. Regional level

The role and functions of the WHO regional offices in respect of information and reporting are two-fold:

(a) to collect, analyse and comment on reports provided by countries, to abstract from this information the data relevant for a regional control strategy and to advise the countries on aspects related to their national epidemiological situation and suggest actions;

(b) to abstract from these reports the information to be transmitted, mainly in the form of tables, to the global level.

The regional offices do not have an easy task considering the difficulties which some of the countries have in preparing and consolidating their own reports. In addition, countries have established various reporting procedures to suit their particular objectives, needs and conditions. For this reason, the reports arriving in the regional offices have different formats and the quality of information received may vary from country to country.

For practical reasons, reporting from country level to regional level in the Organization takes, in many instances, the form of an annual report on the national antimalaria programme. However, in countries where malaria activities are part of the general health services, the malaria information may form part of a more general report on the health services. In order to simplify reporting, countries in several regions use a set of tables - the same that is used by WHO between regions and headquarters - for providing the regional offices with essential numerical information.

4.2. Global level

The main purpose of information in respect of antimalaria programmes and action is:

(a) to provide national health authorities as well as the governing bodies (World Health Assembly, Executive Board of WHO) and the international community (international and bilateral agencies, institutions and institutes) with the most up-to-date knowledge of the world malaria situation and control strategies, including achievements and constraints on the control effort;

(b) to inform national health services, organizations concerned with travel and private practitioners as to where and when there is risk to international travellers with regard to contracting malaria and to advise on the preventive measures to be followed.

4.3. Information on the world malaria situation

Following resolution WHA22.48 and the suggestions made by the sixteenth and seventeenth Expert Committee on Malaria, WHO publishes annually a document on the world malaria situation. It provides the governing bodies and, more importantly, the Member States with an overview of the malaria situation and with details by country. The information contained in the document is based mainly on data provided to WHO Headquarters by the regional offices in the form of a set of tables. However, the information often does not cover the whole year under consideration or may be lacking in completeness for certain countries. One of the main reasons for this appears to be the size of a country and its administrative structure. Delays that may occur in reporting accumulate at global level, prolonging the time lapse between the reporting period and the date when the information is published.

Taking into account the views expressed at the last meeting of the Expert Committee on Malaria held in November 1989, the participants recognized that the kind of data currently reported needs modification and stressed the need for speeding up the reporting of information at all levels.

4.4. Information on epidemics

The meeting discussed the need for countries to report the occurrence, and particularly the beginning, of epidemics or important foci as soon as possible in order to permit WHO to inform other Member States, especially neighbouring countries, and so that the latter may be prepared. This information should include details of any measures taken or planned to remedy the situation. The possibility exists of making this kind of information available through the automatic telex reply service for epidemiological information at WHO Headquarters.

4.5. Information on malaria risk for international travel

Information is published on the international malaria situation by WHO at the beginning of every year in a booklet entitled "International Travel and Health".

It is intended to assist Member States, health authorities and agencies dealing with travel in providing international travellers with the information necessary to prevent the acquisition of malaria.As the booklet is updated annually it gives, in general terms, the most recent information available to WHO.

For this reason it represents a potentially important source of information for Member States and all those concerned with international travel. It is through this publication that WHO can make available information on changes in the epidemiological situation and risk areas as early as possible.

5. MAJOR ISSUES CONSIDERED BY THE 19TH EXPERT COMMITTEE ON MALARIA

The 19th Expert Committee on Malaria met in Geneva from 6 to 14 November 1989. The main issues raised of relevance to the present consultation were: the strengthening of malaria diagnostic services and treatment facilities; the epidemiological approach to malaria control; the antivector component of malaria control; and the mechanisms for recognition and control of epidemic.

5.1. Malaria diagnosis and treatment

Early diagnosis and treatment of malaria continue to be the priority among antimalaria activities. Detection and management of malaria must be initiated by the patient or parents; promptness of intervention is critical for limiting severe illness and death. Management of malaria should be the responsibility of the health services in partnership with patients. The malaria services should provide technical guidance on diagnostic criteria and services and the definition of effective drug use.

Local definition of clinical malaria is essential as a basis for educatin and training of health staff and of the general population. Microscopic diagnosis is needed for the managment of severe disease, treatment of therapy failures, and the management of malaria in areas of multi-drug resistant Plasmodium falciparum, particularly when more than one species of Plasmodium exists.

The degree of risk of accidental infection from lancets used for taking blood films for malaria diagnosis is at present not known. However it must be considered as a risk. This can be reduced by more critical selection of blood samples taken for routine surveillance and by better training of health staff in how to protect themselves and the patient from infection.

The selection of appropriate malaria therapy and prophylaxis regimens must emphasize the provision of effective interventions at all levels. Effectiveness should be defined in terms of alleviation of disease, elimination of risk of mortality and limitation of chronic morbidity such as anaemia. Factors such as drug cost, the availability and reliability of referral systems for managing therapy failures, and side effects and toxicity must be taken into consideration when deciding on appropriate therapy. A drug use policy must be a dynamic set of guidelines adapted to changing patterns of malarial disease, drug efficacy and drug toxicity.

5.2. Epidemiological evaluation

The principles of a malaria control strategy are:

-   the formulation of realistic objectives in respect of attainability;

-   the appropriate distribution of responsibility between specialized services and general helath services; and

-   the epidemiological approach to selection, monitoring and evaluation of interventions.

It is, therefore, necessary to amend current epidemiological practices in order to make them action-related and able to provide information required for implementation and evaluation of control interventions. Most of the information required may be provided by general collaborative services or by a routine specialized antimalaria programme. Malaria surveillance systems have considerable resources of trained personnel who, in many countries, are the only members of the health services with detailed epidemiological knowledge regarding local conditions, including population distribution and social and ecological characteristics. These resources consitute a valuable asset for the establishment of peripheral epidemiological services and should, therefore, be retrained with the objective of obtaining the required information in lieu of continued performance of unproductive routines.

In the management of malaria, epidemiological situations have to be analysed, appropriate intervention measures developed and existing sources and parameters of information evaluated for their relevance to malaria control methodology. Large amounts of information are continuously generated through the ordinary operations of the health services, public and private, but the relevance and quality are variable and limited. Nevertheless, it has the advantage of being cheap and readily available and utilization of such information can be greatly improved. In using this information it is useful to bear in mind its limitations with respect to quality, completeness and standardization in space and time.

For routine assessment or counting of relevant events the numerators are: cases of malarial disease, cases of severe and complicated malaria, malaria deaths, treatment failures and emergency situations. The numerators alone may be of some use in estimating needs or assessing time trends but their usefulness might be greater if they were related to populations at risk (denominators) for the calculation of indicator rates. The actual populations at risk are, however, not always clearly defined and are usually impossible to count accurately. Therefore various substitutes are used instead.

Some eligible denominators, more or less readily available according to situations, are:

(a) the population served by health service units at different levels - this permits calculation of population incidence rate;

(b) the total number of patients (all causes combined) - cases of malarial disease may be expressed as a proportion of detected diseases;

(c) the total number of hospitalized patients - hospitalized malaria cases may be expressed as a proportion of all hospitalized cases;

(d) the total number of certified deaths or hospital deaths - this may be used as a dneominator in expressing numbers of malaria deaths, and the results expressed as a proportion;

(e) the total number of episodes of malaria treatment or of those cases tested according to some simple type of first line screening - these may be related to the number of treatment failures to calculate failure rates;

(f) the number of reporting units (institutional health units from first to third line) or geographically defined administrative units such as districts - this is a crude but sometimes useful indicator for coverage.

Some of the information required in the management of malaria cannot be derived from the data collected more or less routinely by the health services and is only obtainable through special sample surveys. As the number of variables that might be explored by surveys is very large, and as surveys are expensive and require special investment, it is important to review critically, within each malaria control programme, what kind of data are really required for action, how much and of what quality. Special sample surveys to determine the sensitivity of parasites to antimalarial drugs, parasitological and serological surveys, retrospective investigation of deaths and social, economic and behavioural surveys may be of particular value for action in many programmes.

5.3. Antivector measures in malaria control

Available antivector measures, even if maximally implemented, are insufficient to surmount the most severe conditions of stable malaria such as those prevailing in tropical Africa. However antivector measures are of fundamental importance in malaria control in a wide range of conditions in which the stability of malaria transmission is lower, and usually depend on the degree of endophily and anthropophily of the adult mosquitoes and the detection of restricted larval habitants.

It is recognized that, in certain programmes, standard insecticide treatment continues to play an important role and may be the only feasible intervention method in the short term for situations such as epidemic control. However, in most other cases the impact of insecticides employed in a routine manner is highly suspect and needs to be reassessed from the aspect of optimal use of resources within the context of malaria control through primary health care. The following points should be stressed:

(a) Where the impact of insecticide treatment is not clearly reflected in a reduction in the disease incidence or in the severity of the problem, then this method of intervention cannot be recommended;

(b) Where residual insecticide application can be expected to have the same overall impact as community-based methods such as self-protection (bednets, screens etc.), then community efforts should have priority.

5.4. The management of epidemic malaria

Although some recent malaria epidemics have resulted from the failure of programmes to maintain the gains achieved, as was the case with the majority of post/eradication epidemics, an increasing number of epidemics are of a more complex and diversified nature. As a rule, they have occurred in remote and/or under-populated areas where greatly intensified socio-political and economic activities have led to the creation of conditions more favourable to malaria transmission than were pre/existing conditions.

The most typical epidemiological situations, with their interplay of environmental, epidemiological, social, economic and demographic factors, associated with the current wave of malaria epidemics, include forest and jungle areas subjected to: agricultural colonization and/or economic exploitation, large-scale agricultural projects, settlement programmes with people from non-malarious areas, extensive cotton plantations; and areas affected by war, socio-political disturbance or disaster. These situations have many features in common which are favourable to malaria transmission and unfavourable to malaria control. The most important are: the increased mobility of population; increase in man/mosquito contact; the low immune status of the population; the absence of community spirit; the lack of knowledge in the population about malaria; and the marginality of situations within the jurisdiction of civilian administrations and health authorities. Contact and information flow between the public health authorities and the general population are also complicated by serious logistic problems.

Malaria epidemics associated with new epidemiological situations can in some instances be prevented or at least greatly reduced in their intensity and severity if the national health authorities: (i) are fully aware of their implications for the population's health and socio-economic development; (ii) have the epidemiological capabilities necessary to the prediction and detection of malaria epidemics and the mechanisms appropriate to the execution of preventive and control measures; and (iii) are able to mobilize on time the assistance needed from governmental and other agencies wherever the resources required are beyond the health services' capabilities.

A lack of technical competence in many countries, at all levels, is probably one of the main reasons for poor performance in the detection of malaria epidemics. Many epidemics, especially those associated with extensive population movement to new areas or development projects, could easily be predicted and epidemiologically sound plans for their prevention and control worked out in advance. Most countries continue to rely on the same traditional health information and reporting systems which have proved formerly unsuitable for the reporting of any kind of epidemic, largely because of delays in reporting from the periphery to the decision-making levels and the lack of analysis capability at all levels, but particularly at the intermediate level where there is generally a lack of epidemiologically oriented staff capable of analysing and interpreting the information recorded at the periphery.

6. OBJECTIVES OF MALARIA PROGRAMMES IN DIFFERENT EPIDEMIOLOGICAL SITUATIONS IN THE REGION

Each of the groups of countries outlined in section 3 has different epidemiological objectives as developed by the participants in the meeting.

(a) **Malaria-endemic countries with nationwide malaria control programmes**

- To prevent the re-establishment of the disease in malaria free areas;

- to maintain low incidence of the disease in areas where this has been achieved;

- to reduce the incidence of malaria in areas where this has not been achieved, and thereby prevent or reduce mortality;

- to increase the cost efficiency and diversification of resources to achieve the above;

- to prevent the re-establishment of P. falciparum in countries where it has been eliminated.

(b) **Malaria-endemic countries without nationwide malaria control programmes**

- To reduce morbidity;

- to reduce mortality;

- to provide protection from malaria to high risk groups;

- to provide for early detection and control of epidemics.

(c) **Countries which are considered to be malaria free**

- To maintain the malaria-free status of the countries;

- to ensure early detection and prompt treatment of imported cases to prevent mortality from malaria.

7. INDICATORS COVERING THE NEEDS OF DIFFERENT EPIDEMIOLOGICAL SITUATIONS

Indicators and their definitions were discussed in group sessions; it was found that similar indicators were identified by different groups. It was also clear that the different epidemiological situations occurring in some countries require different objectives and different sets of indicators. Indicators covering all epidemiological situations are listed below; each country or area may select those applicable to its own malaria situation

INDICATOR	DEFINITION
Clinical malaria incidence	Number of clinical malaria cases per 1000 population in the catchment area.
Proportional malaria rate	Number of clinical malaria cases per 100 patients attending any health establishment, whether public or private.
Parasite incidence	Number of laboratory confirmed cases per 1000 population (species-wise).
Slide positivity rate	Number of slides positive for malaria per 100 slides examined.
Clinical malaria positivity rate	Number of slides positive for malaria per 100 slides examined from patients clinically diagnosed as having malaria.
Malaria case rate	Number of microscopically confirmed cases per 100 out-patients.
Malaria hospitalization rate	Number of malaria cases hospitalized per 100 hospital admissions.
Severe cases referral rate	Number of severe cases referred to hospitals per 100 cases treated for malaria.
Severe cases hospital rate	Number of malaria cases hospitalized per 100 malaria cases attending hospital as out-patients.
Treatment failure rate	Number of cases not responding to specific antimalarial treatment per 100 P. falciparum cases treated.
Indigenous malaria incidence	Number of indigenous cases per 10 000 population.
Malaria case fatality rate	Number of deaths due to malaria per 100 laboratory confirmed cases.
Proportional malaria mortality rate	Number of deaths due to malaria per hundred deaths due to all causes.
Age specific mortality rate (under 5)	Number of deaths due to malaria under five years of age per 100 deaths among children under five.

INDICATOR	DEFINITION
Vector adult density	Number of adult mosquitoes per room.
Vector larval density	Number of larvae per dip.
Man biting rate	Number of anopheline mosquitoes collected per man/night.
Vector susceptibility	Percentage of mosquitoes dead after exposure to diagnose dose of insecticide.
Malaria positivity rate in pregnancy	Number of positive cases (laboratory confirmed) per 100 pregnant women examined.
Protection rate of pregnant women	Number of pregnant women protected by chemoprophylaxis per 100 women in age group 15-45 years.
Protection rate of other high risk groups	Number of persons protected by chemoprophylaxis per 100 persons of a defined high risk group.
Drug consumption	Quantity of antimalarials consumed per month (or per year) - an absolute figure covering different antimalarials from both public and private sectors.
Private sector consumption ratio	Percentage of drugs consumed by the private sector from total consumption (both public and private).

8. PROBLEMS THAT MAY IMPEDE THE DEVELOPMENT OF EPIDEMIOLOGICAL INFORMATION AND RESPONSE MECHANISMS

The participants considered a number of potential problems which might place constraints upon the development of appropriate epidemiological information and response mechanisms and thereby hinder proper planning, implementation and evaluation of the programmes. These problems include:

- difficulty in defining the population at risk;
- difficulties encountered in making a precise definition of what consitutes a malaria case statistically in a control programme;
- difficulties in diagnosing and counting severe malaria cases;
- difficulties in diagnosing whether or not a death was de to malaria;

- difficulties in estimating consumption of antimalarial drugs;
- lack of trained manpower at different levels;
- lack of logistics and financial resources;
- lack of managerial skills;
- lack of proper job descriptions;
- lack of coordination among different sectors dealing with the malaria problem;
- lack of motivation among the various categories of health personnel.

9. RECOMMENDATIONS

1. Each country should create a core group (or groups) of malaria experts according to size of the country and availability of human resources, to carry out programme planning, to oversee implementation and evaluation and to guide the health services and other related sectors in various aspects of malaria control.

2. Realizing that the countries of the Eastern Mediterranean Region are prone to malaria epidemics and that the collection, collation and timely analysis of information on malaria is essential for the early detection and control of such epidemics, it is recommended that:

    (a) countries review their existing capabilities within the general health services, special services and epidemiological services in the early detection and control of epidemics;

    (b) countries develop an epidemic surveillance and response mechanism, and through this mechanism report epidemics to neighbouring countries

    (c) countries develop a malaria emergency preparedness plan within the national emergency plan that will include the capability to mobilize the necessary manpower, supplies and equipment and that this plan be shared with neighbouring countries;

    (d) countries with epidemic experience, present, past or in the future, document their experiences with regard to detection and control and share this experience with other countries;

3. Recognizing that in most cases patients are treated for malaria on the basis of a clinical diagnosis only (and not on the basis of microscopic confirmation which, where this capability exists, may be made available subsequently) it is recommended that:

    (a) countries improve their capability in the clinical diagnosis of malaria, especially at the periphery, by developing easily understandable guidelines that also permit, as far as possible the diagnosis of other locally occurring conditions that cause fever; this will lead to a better targeting of antimalarial treatment on a clinical basis to those who really need it;

(b) countries develop the capacity for malaria microscopy in all referral facilities, particularly at the peripheral level, so as to enable the evaluation of treatment failures, better management of severe malaria cases and differentiation of parasite species with a view to providing alternative treatment where indicated;

(c) countries develop systems to make use of, for evaluation and planning purposes, the information available as a result of implementing (a) and (b) above, such as the number of clinically diagnosed cases, cases failing to respond to treatment, severe cases, cases receiving antimalarial drugs etc., classifying such information by relevant particulars such as age, sex and location where indicated;

(d) countries develop mechanisms to obtain and utilize available data from the private sector, such as private practitioners, pharmacists or drug vendors, on cases treated, treatment failures, side effects, severe cases and death.

4. In many countries populations are practising self-treatment of various illnesses including malaria. To acquire more information on this practice it is recommended that:

(a) countries collect and collate data on how antimalarial drugs are used by populations, why, which drugs are used, who provides or sells drugs, in what quantity and with what advice, if any;

(b) emphasis be given to education of the public, in addition to health personnel and community health workers; based on the above information; this will improve diagnosis and treatment, use of self and communal protection practices, knowledge of when and where to seek medical attention etc.

(c) social channels of communication be utilized in the education of the public such as those afforded by communal and religious leaders, traditional birth attendants, pharmacists and drug vendors, school teachers, and radio broadcasts. In addition, health professionals including private practitioners should be kept well informed of national treatment policies;

(d) utilizing the information derived from (3c), (3d) and (4a) above, countries develop national antimalarial drug use and control policies as part of the essential drugs programme to: (i) define effective treatment regimens; and (ii) to regulate the importation, distribution and pricing of antimalarial drugs.

5. Countries are encouraged to commence a process of stratification (of malaria and its determinants) as part of the epidemiological approach to malaria control, utilizing all the information and knowledge available such as the distribution of the disease in time and space, the distribution of vectors and their bionomics, the distribution of health facilities and resources, operational difficulties, areas of socio-economic development, climatic or other geographic determinants, and type of population and special characteristics e.g. of nomadic populations.

A simple stratification will enable programmes to set priorities, to re-allocate scarce resources to where they are most needed and to replan antimalaria activities according to the local epidemiological situation.

6. To accomplish the above recommendations intensified training activities at all levels will be required. It is recommended that countries develop malaria training activities in collaboration with other health units and divisions to economize on time and resources, and that full use be made of expertise available within the country for basic training and continuing education at all levels.

7. WHO should mobilize technical and other resources to support Member States as needed, and especially the least developed countries, in the implementation of the above recommendations, and in particular to support training activities.

Annex I

AGENDA

1. Registration.

2. Opening ceremony.

3. Election of officers.

4. Adoption of agenda.

5. Review of information and reporting systems in different epidemiological situations in the Region.

6. Presentation of the recommendations discussed at the meeting of the Nineteenth WHO Expert Committee on Malaria with emphasis on information system development.

7. WHO information requirements.

8. Information system requirements at various national levels for:

   - proper management of the programme;
   - understanding of epidemiological happenings including forecasting of epidemics.

9. Integration of malaria reporting system within the PHC system.

10. Working groups to produce models for:

    (a) reporting systems in countries with no malaria transmission;
    (b) reporting systems in countries with nationwide malaria control programmes;
    (c) reporting systems for countries with partial population coverage of malaria and PHC.

11. Presentation and discussion of group work.

12. Recommendations.

13. Closing session.

Annex II

LIST OF PARTICIPANTS

REPUBLIC OF AFGHANISTAN	Dr M.A. Karimzad President, Malaria and Parasitology Institute Kabul
DEMOCRATIC YEMEN	Dr Abdul Rahman Mohsin Keraisha Director of PHC in Lahej Governorate Aden
IRAQ	Dr A.H. Ismael Director of Communicable Diseases Epidemiology and Malaria Department Ministry of Health Baghdad
JORDAN	Dr M.R. Tawfik Director, Malaria Department Ministry of Health Amman
	Dr Ali K.S. Al Arbaji Malaria Department Ministry of Health Amman
OMAN	Dr A. Ben Daoud Ben Hassan El Lawatia Malaria Control Department Ministry of Health Muscat
SAUDI ARABIA	Dr Abdel Raheem Aqeel Director-General, Gizan Health Affairs Gizan
SOMALIA	Dr M.H. Wais Director of Malaria and Schistosomiasis Control Programme Ministry of Health Mogadishu
SUDAN	Dr El Rashid Abdel Rahim Director-General of Malaria Ministry of Health Khartoum
UNITED ARAB EMIRATES	Dr Mohammed Amin Al Haq Malariologist Malaria Control Programme Sharjah

UNITED ARAB EMIRATES		Dr Fahmi Beidas Ministry of Health Malaria Control Al Ain
YEMEN		Dr Ali M. Assabri Director-General of Health Manpower Institute Ministry of Health Sana'a

Observers

Dr F.G. Farhous
Dr Hani T. Abdullah
Dr Abdulla A. Rahman Salem
Miss Lina M. Assaf

WHO Secretariat

Dr G.A. Farid	Regional Adviser Malaria	World Health Organization Eastern Mediterranean Regional Office, Alexandria
Dr P. Beales	Chief PAT/MAP	WHO Headquarters, Geneva
Mr J. Hempel	Technical Officer MAP	WHO Headquarters, Geneva
Dr G.M. Sakya	WHO Malariologist	Intercountry Malaria Team Mogadishu
Dr A.K. Afridi	WHO Malariologist	Khartoum, Sudan