SPECIAL ARTICLE

Malaria: Overview of the Global Situation and Problems in Asia

by

S U M A R M O

(From the Department of Child Health, Medical School, University of Indonesia, Jakarta, Indonesia)

Abstract

The overall world malaria situation has remained static in recent years, but the disease continues to be a major public health problem in endemic countries. Of a total world population of 4818 millions in 1985, about 2316 millions (48%) live in areas where antimalarial measures are carried out. About 405 millions people inhabit areas where no specific measures are undertaken to control malaria transmission, and the prevalence of malaria remains virtually unchanged.

In Asia west of India, 186 out of 222 millions people live in originally malarious areas. Fifteen million people live in areas which have been freed from the disease, and 35 millions in areas with limited risk. About 4 millions people are not protected by specific antimalarial measures. In Middle South Asia, with a total population of about 884 millions, 850 millions (96%) are exposed to malaria risk of varying degrees. With the exception of a small area in Nepal, all originally malarious areas are included under malaria control operations. Of a total population of 1670 millions in the East Asia and Oceania region, 1324 millions live in originally malarious areas. Malaria has been eradicated from areas where 244 millions live, and the risk in considered to be limited in areas with a population of 531 millions.

In view of the goal of health for all by the year 2000, malaria control programs must be an important part of the overall health program in malarious countries. These programs would require participation of many different disciplines, including some not specifically related to health care. This must be done with an understanding of malaria epidemiology and the local ecological situation, and tailored to economic reality in the malarious region being considered.

Invited paper: Presented at the Symposium "Newer Approaches Towards the Malaria Infection", of the 6th Asian Congress of Paediatrics, Tokyo, Japan 27-31 March 1988.

Introduction

The overall world malaria situation has remained static over recent years and the disease continues to be a major public health problem in endemic countries. Countries which were originally non-malarious and those from which the disease has been eradicated have remained malaria-free on the whole. About 100 countries or areas have indigenous malaria. Downward trends in the number of cases reported continued in some countries while in others the increase in incidence has come to a halt: Nonetheless, the situation has been worsening in a number of areas. (WHO, 1987).

In 1985, the number of malaria cases reported was 4.8 millions (provisional figure) compared with 5.4 millions in 1984, 5.6 millions in 1983 and 6.5 millions in 1982. These figures do not include data from the WHO African Region (comprising most countries south of the Sahara) as reporting is very limited in coverage.

Of a total world population of 4818 millions in 1985, about 2316 millions (48%) live in aeas where antimalarial measures are carried out. In many of these area the health infrastructure is not sufficiently developed to ensure the maintenance of a favourable epidemiological evolution. This situation is precarious as these areas are under the constant threat of intensification and spread of specific malaria problems, which make the control measures applied less effective and more costly. Efforts are being made to incorporate appropriate antimalaria activities into developing primary health care systems, but progress has been slow. Managerial and organizational problems persist.

About 405 million people inhabit areas where no specific measures are undertaken to control malaria transmission and where the prevalence of malaria remains virtually unchanged (WHO, 1987).

Magnitude of the Problems

Towards the end of the 1960's and during the 1970's, the malaria situation deteriorated in many tropical and subtropical countries outside tropical Africa. This was as a result of a variety of factors including:

1. Shortage of resources: financial shortcomings in the support of antimalarial activities, partially prompted also by the withdrawal of bilateral and international assistance, and inflationary price, increases of equipment, supplies and running costs;
2. Limited health service: national decisions, often prompted by international advice, to have antimalarial activities taken over by general health services, some of which proved to be unable to cope with this responsibility;
3. Lack of reliable health statistics;
4. Failure of the rural population to realize that malaria is one of the main causes of morbidity and mortality;
5. Administrative shortcomings caused by reductions in manpower, rapid turnover of staff and lack of adequately trained personnel; and
6. Technical problems such as resistance of anopheline vectors to insecticides, resistance of *P. falciparum* to chloroquine, exophilic behaviour of malaria vectors, uncontrolled or uncontrollable population movement, human customs and the inaccessibility or political instability of malarious areas (Harinasuta et al., 19882; WHO, 1983).

The evolution of the malaria situation continued to be influenced by the resistance of vectors to insecticides and of parasites to drugs. Insecticides have been widely and often indiscriminately used, mainly in agriculture. This has led to the development of insecticide resistance. Many anopheline species of which eight may be considered major vectors affecting human populations in large areas, are now resistant to more than one insecticides. In several malarious contries this resistance in widespread and countinues to affect the antimalaria programs (WHO, 1987).

Resistance of *P. falciparum* to quinine was first recorded in 1910 in Brazil and later it was found to be resistant to pyrimethamine in countries of Asia and Africa. However, with the appearance of *P. falciparum* resistance to chloroquine in 1957 in Thailand and later in Columbia, South America, this problem assumed world wide significance. The frequency and distribution of *P. falciparum* resistance varies in different countries, being extensive in Thailand, Burma, Viet Nam and Hainan Island in China, but being confined to localized areas in Indonesia, Papua New Guinea, Philippines and Solomon Islands (Harinasuta et al., 1982; UNDP/World Bank/WHO, 1983).

The resistance of *Plasmodium falciparum* to drugs continued to be a problem: it has now been detected in more than 50 countries. However, this phenomenon may not necessarily be widespread in a country and therefore chloroquine can still be effective and give a clinical cure in large areas of the world, especially in the presence of acquired immunity (WHO, 1987).

Behavioral changes in vector mosquitoes arising from insecticide pressure have been reported from different parts of the world.

Population movement to and from malarious countries is of epidemiological importance. The extent of population movement varies within the different countries and arises from a variety of reasons. These movements are largely uncontrolled and impose a heavy strain on the antimalaria program. Serious problems can also arise from a large influx of population from across international borders during political disturbances (Harinasuta et al., 1982).

Malaria Situation in Asia in 1985 (WHO, 1987)

Asia west of India

In Asia west of India, 186 out of 222 million population live in originaly malarious areas. Fifteen million people live in areas which have been freed from the disease, and 35 millions in areas with limited risk. About 4 millions people are not protected by specific antimalaria measures.

Bahrain, Cyprus, Israel, Jordan, Kuwait, Lebanon and Qatar continued to be free from indigenous malaria. The surveillance schemes in these countries-excluding Lebanon where activities are limited-successfully prevented the re-establishment of transmission despite the very high number of imported cases recorded.

Of the countries with nationwide antimalaria activities, the Islamic Republic of Iran, Oman, Pakistan, the Syria Arab Republic and the United Arab Emirates reported fewer cases than in 1984. An increase was recorded in Iraq and Saudi Arabia.

Middle South Asia

Of a total population of about 884 millions in the area, some 850 millions (96%) are exposed to malaria risk to varying degrees. With the exception of a small area in Nepal, all the originally malarious areas are included under malaria control operations.

There was a slight improvement in the overall situation with fewer cases reported than in 1984, except for Nepal where the incidence increased. Major constraints in pursuing the program objectives are of a technical operational and managerial nature including movement of healthy and infected people between receptive and endemic areas. Vector resistance to commonly used insecticides continued to be a problem in parts of India, Nepal and Sri Lanka. With the exception of Maldives, falciparum malaria resistance to chloroquine has been widespread, and in Bangladesh resistance to the alternative drug-a combination of sulfadoxine and pyrimethamine-has spread.

East Asia and Oceania

Of a total population of 1670 millions in this region, 1324 millions live in originally malarious areas. Malaria has been eradicated from areas where 244 millions live, and the risk is considered to be limited in areas with a population of 531 millions.

Australia, Brunei Darussalam, the Democratic People's Republic of Korea, Hongkong, Japan, Macao, Mongolia, the Republic of Korea, Singapore, large areas of China and most of Oceania are considered to be free of malaria.

Brunei Darussalam, where the last indigenous malaria case was detected in 1971, has requested WHO to certify the eradication of malaria in its territory. The procedure has been initiated.

In Indonesia, where some 156 million people out of a total of 163 millions live in malarious areas, malaria control operations covered Java and Bali (94 million people) and priority areas of transmigration and socioeconomic development in the outer islands. In Java and Bali the operations included residual house-spraying in areas with high malaria incidence (covering 5 million people); in some other areas case detection and treatment (covering 91 million people) antilarval measures and limited bio-environmental control methods were used. In the outer islands, control measures included residual house-spraying and malariometric surveys in priority areas, together with passive case detection and suppressive treatment through hospitals and health centres. The epidemiological situation in Java and Bali showed a slight improvement over the previous year. More than 70% of the cases originated from seven districts in Central Java, which has only 27% of the population of Java and Bali combined. Data available from the peripheral health institutions in the outer islands indicate the existence of a large parasite reservoir in these areas. The percentage of positive slides recorded in 1985 was 19%. Vector resistance continued to be a problem in Java: *An. aconitus* maintained a high level of resistance to DDT in the central region and *An. sundaicus* has also shown resistance to DDT in this area. Studies on the sensitivity of *P. falciparum* to chloroquine were extended to further areas. Strains of chloroquine-resistant falciparum malaria have been confirmed in 22 out of the 27 provinces (Departemen Kesehatan R.I. 1986; WHO 1987).

Malaria Control Programs

The application of intensive antimalarial measures in the malarious countries of the South-East Asia Region for achieving the setgoal of eradication had led to the phenomenal reduction in malaria incidence resulting thereby destablization of the natural equilibrium in the transmission dynamics of the disease. Moreover, the rapid ecological and socio-economic changes brought about by the various developmental activities in the countries have contributed in changing the epidemiological features of the disease. The countries are at the present time experiencing difficulties to maintain the gains achieved at a considerable cost and human efforts due to combination of factors technical, operational, financial and managerial.

Following a change in the malaria control strategy the countries of the Region have been trying to adopt appropriate methodology to keep the disease under effective control. But in the absence of clear-cut guidelines and for some administrative and political reasons no significant policy decision has been made at the national level for the adoption of realistic objectives and appropriate approaches. In general the policy has been to maintain a status-quo rather than taking risk for a change.

In order to maximise the use of scarce resources and to hasten the development of health infrastructure the countries of the Region have decided to integrate all vertical programs including malaria control with the health system based on primary health care. This approach though very much desirable and cost-effective in the longrun yet the operational realities require a step by step approach because of the fact that the health infrastructure in the countries is in the process of development and has not yet reached a stage when it can ensure maintenance of the gains achieved through vertical approach (Rashid, 1986).

The malaria control programs in the countries of the South-Fast Asia Region which are in very advance stage of development, have the following objectives in common: (1) Prevention of mortality and reduction of morbidity; (2) Control of malaria transmission; (3) Control of malaria epidemics and (4) Maintenance of achieved gains.

In addition, the eradication of malaria has been retained as the ultimate objective in some countries.

Depending on the epidemiological characteristics of malaria and the availability of funding, the tactical variant suitable for the country is adopted and the methods determined on the basis of the tactical variant selected.

In view of the goal of health for all by the year 2000, malaria control programs must be an improtant part of the overall health program in malarious countries. These programs would require participation of many different disciplines, including those not specifically related to health care. This must be done with understanding of the malaria epidemiology, the local ecological situation and tailored to the economic reality in the malarious region being considered.

The world awaits, with great anticipation, the development of new weapon such as a malaria vaccine in a fight against malaria. For the present, however, we must concentrate on improving our effective utilization of the currently available methods of malaria control.

REFERENCES

1. Departemen Kesehatan R.I.; Direktorat Jenderal Pemberantasan Penyakit Menular dan Penyehatan Lingkungan Pemukiman: Pemberantasan Malaria (1986).
2. HARINASUTA, T.; DIXON, K.E.; WARRELL, D.A.; DOBERSTYN, E.B.: Recent advances in malaria with special reference to Southeast Asia. Southeast Asian J.trop.Med. Pub.Hlth. 13 : 1 (1982).
3. RASHID, K.M.: The malaria situation and control approaches in the Countries of Southeast Asia Region. Regional Technical Consultation on Malaria, 24-28 November 1986, SEARO, New Delhi.
4. UNDP/World Bank/WHO: Sixth Programme Report. Chapter Two: Malaria. Unpublished document TDR/PR-6/83.2-MAL. (1983).
5. World Health Organization: Report of the steering committess of the scientific working groups on malaria June 1980-June 1983. Unpublished document TRD/MAL/SC-SWG (80-83)/83.3.
6. World Health Organization: Rapp.trimest. Statist.Sanit.Mond. 40 : 142 (1987).