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THE POSSIBILITY OF ERADICATING MALARIA
IN THE WESTERN PACIFIC REGION*

by

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Malaria is endemic, to a greater or lesser extent, in the Western Pacific region apart from New Zealand and some islands in the South Pacific. It has practically disappeared from Australia except in its northern part; in Japan, the incidence of the disease has been reduced to such a level that it no longer constitutes a serious public health problem. The greater part of the region, however, is still burdened by this disease.

In discussing the possibility of eradicating malaria in the Western Pacific region, one naturally has to consider certain elements which play an essential part in the overall scheme; these are briefly discussed below.

1. Government support

In no other public health campaign is full government support more important than in a malaria eradication programme. Such support includes not only adequate financial provision until the objective has been achieved, but also the promulgation of suitable legislations (e.g., in making malaria a compulsory notifiable disease and in permitting the proper authority to enter premises to investigate malaria cases)

* The Western Pacific Region referred to in this paper corresponds to the geographical area used by the World Health Organization, extending from Japan to Australia and New Zealand, including Cambodia, Laos and the Federation of Malaya in the west and the South Pacific islands in the south-east. It does not include Kalimantan (Indonesian Borneo) as this belongs to the Republic of Indonesia which in turn is included in the South-East Asia Region. Although mainland China, North Korea and North Viet Nam are included in the Western Pacific Region, they have not been included in this paper because of the paucity of information on malaria from these areas.

with a view to eliminating as quickly as possible the last vestiges of the disease.

It is unfortunate that in many countries in this region, malaria is more prevalent and the problems more complex in areas which have not yet been fully developed and where other diseases also rise to prominence. In these countries, the governments are faced with numerous other pressing problems, such as communication, housing, public education, agriculture, etc. It is gratifying to note that many of these governments have not failed to realize that the control and eventual eradication of malaria in their respective countries has an important and far-reaching effect on their overall programme of economic development; they know that without the burden of malaria their people can better resist other communicable diseases, develop natural resources more effectively, absorb knowledge more readily, work in the farms and in other industries more efficiently, and reduce the cost of production considerably. Because of their immediate and visible results, antimalaria projects have indeed been effectively used as a "wedge" to induce the people to accept and co-operate with other public health and socio-economic programmes.

However, the recent discovery of the possibility of the development of resistance of the malaria vectors to insecticides has confronted governments with a dilemma which is best described by Dr E. J. Pampana in his speech at the conclusion of the Baguio conference:*

"... either we go on spraying DDT where the need is felt from year to year and the chances are that we shall have to continue indefinitely - until DDT resistance develops and the whole scheme may end in failure, with dire consequences for the population which will by then have lost its immunity; or governments must decide to intensify their efforts, concentrating them in the few years necessary for the eradication of the disease before DDT resistance may occur so that they may later

* Malaria Conference for the Western Pacific and South-East Asia Regions, City of Baguio, Philippines, November 1954. The report of this conference has been published in Wld Hlth Org. techn. Rep. Ser., 103.

eliminate from their budgets the major item of malaria control to be replaced by a more economical item, that of malaria surveillance or vigilance. Obviously, only one of these alternatives can rationally be chosen and it would be a grave responsibility for a government to choose the wrong one".

The Governments of China (Taiwan) and the Philippines have changed the goal of their antimalaria programmes from merely controlling the disease until it ceases to be an important public health problem, to that of eradication. In Sarawak, field operations are being expanded with eradication in view, and in Cambodia, Laos and South Viet Nam plans are being discussed to undertake antimalaria programmes with eradication as the goal. Other countries in the Region are seriously considering plans to strengthen their health services with a view to starting intensive anti-malaria programmes, while still others have not yet decided what to do.

2. Technical feasibility

Modern malaria control and eradication procedures are chiefly based on residual spraying of premises with insecticides with the object of stopping malaria transmission; consequently, factors affecting the efficiency of this operation, such as the bionomics of the vector species, local customs and practices have to be considered to determine whether or not malaria eradication has a reasonable chance of success. It is fortunate that so far in the Western Pacific Region none of the malaria vectors has been known to have developed either a resistance to insecticides or a behavioural change.

Doubt was expressed a few years ago as to whether residual insecticidal methods would be effective in stopping malaria transmission in a number of countries in the Region because of the supposedly "wild" nature of the vectors, but one by one these vectors have been found to be susceptible to residual insecticides; first the Anopheles flavirostris in the Philippines, then the leucosphyrus leucosphyrus in Sarawak, and finally the punctulatus group in New Guinea and the South Pacific. Studies are still in progress in North Borneo with leucosphyrus balabacensis, but there are excellent indications that malaria transmitted by this species can also be stopped by residual insecticides.

The movement of population, ranging in size from a family or two, to communities of several hundred people, and in duration, from a few days' excursion to rice fields and vegetable gardens to straightforward nomadism, takes place in many countries in the Region. This practice naturally reduces the effectiveness of the control measures in the villages. Efforts have been made (in Cambodia and Sarawak) to supplement the control measures in the villages by spraying the temporary huts and shelters in the fields, but this has generally been a most tedious job because these shelters are widely scattered in isolated areas and are often difficult to locate.

It therefore appears essential to undertake studies to determine an effective, economical and practical means of stopping malaria transmission in countries where the inhabitants live part of the time in temporary field shelters, before a malaria eradication programme can be reasonably assured of success.

3. Supply of local technical personnel

There is a lack of sufficiently trained local antimalaria workers in the Region, except in Taiwan (China) and the Philippines where training programmes have been undertaken by the Governments. This personnel problem is often aggravated by the lack of adequate inducement for the local people to be attracted to, and to remain in, the malaria service; for example, a technician would rather work in a hospital laboratory, keep regular office hours, be with his family every day, live in a town, etc., than join a malaria team and be exposed to hazards in the field and isolated places, work till late at night, etc., if the salary were the same.

WHO has been encouraging the training of local personnel of all levels, through either fellowships or in-service training with or without the assistance of a WHO team. The difference in cultural patterns and languages which has been an obstacle in promoting an intra-regional training programme, has been to some extent surmounted, as shown by the successful training of technicians from Viet Nam in Taiwan and in the Philippines.

Governments in the Region are becoming aware of the importance of having adequately trained and adequately remunerated antimalaria workers. The Malaria

Conference in Phnom-Penh in January 1956, as well as the First Borneo Inter-territorial Malaria Conference in Kuching, in February 1956, saw the need to provide adequate salaries and security of tenure to antimalaria workers. A complement of technically reliable, conscientious and hard-working antimalaria workers - so essential in a malaria eradication campaign - will be difficult to develop unless this question of salary and tenure is settled by governments.

4. Funds

Lack of funds for supplies, equipment, transport, salaries and other expenses needed by the campaign, has deterred governments from undertaking malaria eradication. Taiwan (China) and the Philippines, where eradication programmes are in progress, largely depend on bilateral assistance (USA-ICA) for their supplies, equipment and transport. Cambodia, Laos and South Viet Nam are also assisted by the USA-ICA. Sarawak is being assisted by a vote from the Colonial Development and Welfare Office in England. Netherlands New Guinea and North Borneo are being provided insecticides, sprayers, transport and laboratory equipment by UNICEF.

But while financial considerations do play an important role in deciding whether or not a malaria eradication campaign should be undertaken, the future looks bright, firstly, because malaria eradication, unlike malaria control, involves concentration of efforts and expenses for only a given number of years, and secondly, because of the high priority given by assisting bilateral and international agencies to the eradication of the disease.

5. Security

It is obviously extremely difficult, if not impossible, to undertake malaria eradication in an area where armed hostilities, political disturbances or lawlessness exist. Lack of security has greatly hampered antimalaria operations in at least three countries in the Region and a similar experience has been reported from another region.

6. Co-operation and co-ordination

The need for close co-operation and the importance of co-ordination in the planning and implementation of malaria eradication programmes among neighbouring countries has been emphasized by the Baguio Conference, the Malaria Conference in Phnom-Penh and the First Borneo Inter-territorial Malaria Conference in Kuching. Needless to say, properly co-ordinated antimalaria programmes are cheaper, more effective and more conducive to early attainment of success. It is interesting to note that countries with active antimalaria programmes are very desirous to co-ordinate their campaigns with those of their neighbours. One cannot help but hope that the political relation among neighbouring countries will continually improve thus permitting them to share the benefits of co-ordinated health programmes.

The antimalaria programmes are well advanced in Taiwan (China) and in the Philippines, where the objectives have been changed from control to eradication. In these countries, the programmes have the full support of the Governments concerned; eradication appears technically feasible; there is an ample supply of trained personnel; assistance is provided by USA-ICA for supplies, equipment, transport and other contingent expenses; and there are no disturbances which seriously affect the security of antimalaria personnel.

In Taiwan, the malarious areas are being sprayed for the third time this year; some areas are being sprayed for the fourth and fifth time (small areas sprayed in 1952 and 1953). The spraying operation this year will cover a total population of over 7 000 000 including a population of about 2 000 000 which will be sprayed for the first time. The latter population was not included in the original scheme because the spleen rate was less than 10 per cent., but with the change of the goal to eradication, this hypoendemic area has been included. It is expected that in 1957 it will be possible to stop spraying in certain areas, depending on the final assessment which will be conducted by a WHO malaria advisory team and a malaria consultant during the last quarter of 1956. Although resistance of the vector species to DDT has not been observed in Taiwan, the campaign had some difficulty in overcoming the objections of the house owners to having their premises sprayed,

because of their mistaken notion that the spraying would also eliminate culicine mosquitos and other household pests (DDT-resistant bedbugs exist in Taiwan). This objection has been overcome by using a mixture of DDT and BHC.

In the Philippines, the nation-wide residual spraying operation was started in 1954 and includes a population of 6 248 000 people. This yearly spraying will be continued until 1957, when the services of a WHO malaria advisory team and a malaria consultant will be utilized (early 1957) to assess the programme. In 1958, provision has been made by the Government and the USA-ICA for the spraying of 50 per cent. of the malarious areas. DDT resistance on the part of the vector has not been observed in the Philippines, but as in Taiwan, many house owners object to the spraying of their premises because of the following reasons: the insecticide kills their chickens, cats and other pets; it is not effective against pest mosquitos; the deposits on the walls are unsightly; malaria has practically disappeared, etc. This "resistance" on the part of the people is being combatted by health education and other persuasive means, but if these should fail, it seems that legislation will have to be resorted to.

In Cambodia, Laos and Viet Nam, the Governments are interested in anti-malaria programmes. In addition, a WHO malaria team has been assigned to Cambodia. To have a brighter prospect of eradicating malaria in these three countries, however, it would appear essential to:

(a) Conduct investigations to determine an effective, economical and practical means of stopping malaria transmission among the rural population who live several months each year in temporary shelters in the field. (It has been shown that the incidence of malaria among the mountain people in Viet Nam could be reduced considerably by supplementing residual spraying with short courses of antimalaria drugs to children. This is now being tried in Cambodia.);

(b) Have an adequate number of trained local personnel. The three countries have recently embarked on an intensive programme to train local personnel. Viet Nam, for example, has been sending technicians to train in the Philippines, Taiwan and India with the assistance of USA-ICA; arrangements have been made by Laos and

Thailand for Laotian personnel to train in Thailand and for Thai technicians to assist in starting the programme in Laos. The WHO malaria team in Cambodia is training local personnel and provision has been made by WHO for fellowships in malaria;

(c) Continue external financial assistance for supplies, equipment, transport and other contingent expenses, otherwise it is improbable that the countries themselves can support a full-scale antimalaria programme. This assistance is being provided at present by USA-ICA;

(d) Hope for the continuation of the present state of security. The work of the malaria teams in Cambodia and Viet Nam was greatly embarrassed a few years ago due to lack of security.

(e) Promote proper co-ordination of the antimalaria programmes, not only among the three countries, but also with those in the other neighbouring countries. Prospects for the co-ordination of the programmes are good in view of the recommendation of the malaria conference in Phnom-Penh to establish the Antimalaria Co-ordination Board.

The Governments of Brunei, North Borneo and Sarawak (in the island of Borneo) are interested in the control and eventual eradication of malaria. The work in Sarawak indicates that malaria transmitted by A. leucosphyrus leucosphyrus can be interrupted by DDT residual spraying, and it is reasonable to expect that the same results will be obtained with A. leucosphyrus balabacensis in North Borneo. However, there is a frequent movement of population in the interior, also along the border areas with Kalimantan (Indonesian Borneo) where it is understood that no active antimalaria campaign has yet been started. Furthermore, there are still nomadic tribes in the interior where residual insecticides are hardly expected to have the same effectiveness as in established communities. Lack of trained local personnel is another problem which WHO is trying to help solve. The countries themselves, apart from Brunei, have to depend on external assistance to carry out an intensive territory-wide antimalaria programme. Although working conditions in the interior are difficult, security is good. The importance of co-ordinating

malaria planning and operations in the whole island of Borneo is obviously of considerable importance (a point discussed at the First Borneo Inter-territorial Malaria Conference).

Lack of trained local personnel has been the chief reason for the delay in undertaking an intensive antimalaria programme in New Guinea. This need is specially acute in respect of the lower grades of antimalaria workers (supervisors, technicians and foremen) and is further complicated by the lack of suitable candidates to train. Efforts are being made by the Administrations of the Territory of Papua and New Guinea and Netherlands New Guinea to overcome this difficulty by establishing training courses, and WHO has been assisting by providing fellowships.

Netherlands New Guinea has a malaria service and the programme is aimed at stopping malaria transmission in population centres and villages which are reasonably accessible by ordinary means of transportation. The Territory of Papua and New Guinea has recently organized a malaria service and an active programme is expected to commence in the near future. It would appear reasonable to expect that the antimalaria campaigns in the island of New Guinea will result in the control of the disease in the towns and accessible villages, but at this time it is extremely difficult to forecast the total eradication of malaria, inasmuch as a considerable part of the island has not yet been explored.

Malaria is endemic in the British Solomon Islands Protectorate and in New Hebrides, and in view of their relatively small population and the fact that the islands have the advantage of natural barriers, it would appear that the eradication of the disease, which is evidently technically feasible, deserves due consideration.

There is paucity of information on the status of malaria and its control in Korea and in Portuguese Timor, and it is hoped that this year will see an improvement of the situation.

To summarize therefore, there are very good prospects of eradicating malaria in Taiwan and in the Philippines; some problems which at the moment do not appear impossible to solve, have to be attended to in a number of countries before the

eradication of the disease can be assured, while in a few other areas (notably New Guinea), it is reasonable to expect the control of malaria in the centres of populations and accessible villages, but the eradication of the disease has to be considered in the light of the experience which will be gained during the next few years' operations.