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PREVENTION OF REINTRODUCTION OF INFECTION*

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A. Introduction of Human Sources of Infection

1. Prevention of the introduction into a country of suspected or potential¹ sources of malaria infection would be utterly unrealistic. It would mean stopping all travellers at the frontier, asking them to give a detailed history of any previous possible exposure to malaria infection and refusing the entry into the country to all persons who could not demonstrate that they cannot possibly be carriers of malaria parasites.

It is therefore believed that this item of the Committee's agenda should be interpreted as the prevention of re-establishment of transmission from the human sources of infection that come into a country from which malaria has been eradicated or which is in the consolidation phase of a malaria eradication programme.

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¹ Potential source of infection may be considered in malaria eradication practice any person with parasitaemia. Suspected source of infection, in the present paper, is any person who could be expected on the basis of his previous history, to present malaria parasites in the blood at present or in the future. A suspicious case is a person who shows clinical symptoms suspicious of malaria. (A malaria case is therefore in this paper a potential source of infection.)

2. This paper takes for granted that surveillance will be carried out according to the Expert Committee's requirements, that, in the maintenance period, a system of total coverage vigilance will be functioning; that there will be a malaria epidemiological unit centralizing malaria intelligence at the central level of the health services, and that the notification of malaria cases and of cases clinically suspicious of malaria, their blood examination and their treatment, where required, will be compulsory.

The migrants

3. It will be recollected that in 1956 WHO convened in Amsterdam a Study Group on International Protection against Malaria. The Group recommended and the Fifth Report of the Committee on International Quarantine (CIQ) noted, that that "interstate travellers" should not be subjected to any special sanitary measure, in the case of "migrants, seasonal workers and persons taking part in periodic mass congregations" special measures should be permitted, including mass administration of drugs to all persons of the groups, with the primary purpose of ensuring that they are non-infectious to anophelines, with or without the further aim of a radical cure of their infection, and that appropriate antimosquito measures should be carried out in the frontier zone or in the centres of aggregation to which such groups are directed.

In the opinion of the CIQ such measures may be taken in accordance with laws, regulations or agreements between states, under Article 103 "as amended" (See CIQ, Fifth Report, p. 9, para. 2). A government can even decide that "if the individual refuses to submit to special measures, he may be refused entry".

The Committee realized, however, that it was not easy to apply the above recommendations. During the last five years experience has shown that the phenomenon of migration can jeopardize the success of malaria eradication programmes. Mass administration of drugs may be done if migrants pass through a frontier post; but often they cross frontiers where no control exist. Even if they do exist, it has only been found possible to administer a single dose treatment to such moving groups which may make the migrants non-infectious to the anophelines for but a few days or weeks, without radically curing them (except perhaps in falciparum infections in highly immunes).

As no drug is available to achieve radical cure of most infections in a single dose, then the administrative problems of giving treatment repeatedly must be solved. Appropriate antimosquito measures are sometimes impossible, when the sites of aggregation are unknown.

4. In many programmes one has the impression that the problem of migrants was not sufficiently studied before the programme started, i.e., in the pre-eradication survey. Thus transmission was allowed to continue among the migrants, at a time when it might have ceased among the stable population if the arrival of the migrants had not kept it going. In some

programmes, the habits and itineraries of migrants were not really investigated until the phase of attack was advanced. In many, no efficient provision was made for timely information as to the sites used for camping.

Planning may thus be at fault by failing to collect all necessary data on migrants before the programme begins. It may also be at fault in neglecting to obtain the full and timely co-operation of other government departments such as the ministry of the interior, the ministry of agriculture, etc., which might enormously help in this subject. The peripheral echelons of the first should be able to know and communicate to the National Malaria Eradication Service (NMES) the movements and changes of camping sites of nomads, and those of the latter the sites selected for camping by seasonal workers, i.e., rice harvesters, cotton pickers, etc. It is during the preparatory phase that another important step should be taken: the selection and training of one (or more) individual (s) of each migrant group¹ who should be paid by the NMES and, in his spare time, act as malaria agent in his group, distribute treatments, perhaps take slides and act as liaison with the NMES for the periodical spraying of tents (where such measure is feasible) or for mass drug distributions, or for antilarval treatments of the camping grounds (if he is so directed by the NMES). Having in each group of nomads, or seasonal agricultural workers, or even of pilgrims, one or more men trained ad hoc as "malaria agents" may go far to solve the problem, provided it is planned very early, and actually started during the preparatory phase, so that it will function satisfactorily during the attack phase. One would think that this service should be continued as long as the whole area within which the group travels is in the maintenance phase. This area often covers parts of different countries, hence the advisability of bi- or multi-lateral agreements implying, namely, that within the migrant groups the malaria agents be recognized as such by the respective NMES.

If a group of migrants periodically moves between one country and an adjacent one, it must be decided, by mutual agreement, which country will do the selection and the training of the migrants' malaria agents and how the work and the expense can be divided.

5. If a simultaneous efficient development of malaria eradication could take place between adjoining countries, the problem of international protection would not arise. As such a perfect co-ordination does not usually occur, the receiving country must protect itself, thereby carrying out efforts and sustaining expenses through no fault of its own. Thus some countries continue spraying operations at the frontier areas while the rest of the national territory is in the consolidation phase. This measure alone, however, would not protect the rest of the country if the migrants were to go there untreated.

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This suggestion, recommended in the Seventh Report of the Expert Committee on Malaria, was put forward by Dr. S. Farmanfarmaian

An example of the expense that a country like India may face to protect itself against the reimportation of malaria may be given. It is planned to keep, after the cessation of the attack phase, 20 eradication units in order to continue spraying until the end of 1966 in an area along the border not less than 10 miles broad: while drugs will be administered to the migrants crossing that area. (Rao, T.R. (1960) Mosquito-borne diseases, Bull. nat. Soc. India Malar. January-March)

Bilateral or multilateral agreements between adjacent countries should always exist for the prevention of reintroduction of malaria. Such an agreement should possibly preceed the implementation of the programme: thus it would help in achieving interruption of transmission in the moving population not later than in the stable population. Even if the problem of groups of population moving across frontiers does not apply, agreements would allow and facilitate the co-ordination of malaria eradication programmes in adjoining countries. They become necessary to any country having entered consolidation if there is still malaria transmission across the border.

In many parts of the world and not only in tropical zones, frontiers are not closely guarded, and people - not necessarily in organized groups - cross it so frequently,¹ that the necessity arises of making efforts to prevent any possibility of transmission in a zone of a certain width on both sides of the border. In most malaria agreements this border protection is provided for and the width of the protected zone 10-20 km broad on each side. The protection is usually carried out by residual spraying and/or by surveillance and drug distribution; in any case, provision is made for frequent exchange of information of the malaria situation in each member country and particularly in their frontier zones.

A great number of malaria agreements exist; bilateral meetings are periodically held; multilateral antimalaria boards exist, but it seems that already in the planning stage of a malaria eradication programme provision should be made for the prevention of reintroduction of malaria when consolidation is reached by means of agreements with the neighbouring countries, where relevant.

The Fifth Report of the CIQ recommended that WHO "should further encourage and assist the co-ordination of malaria eradication programmes with the particular objectives of:

- (1) securing inter-country joint planning of operations and joint mechanisms for the expeditious control of malaria outbreaks in

¹ In countries under an advanced malaria eradication programme, a few cases of malaria are not infrequently found near the borders. A recent example was reported by Gramiccia for Yugoslavia. In 1959 the persistence of malaria cases in Macedonia tended to be localized along the borders (Albania, Greece, Bulgaria). A noted example may be the malaria situation on both sides of the Colombian-Venezuelan border.

international frontier zones in order to avoid the carrying of the disease from one country to another; and

(2) ensuring full exchange between countries of information on the progress of campaigns, movements of groups of people and the susceptibility and resistance to insecticides of anopheline vectors".

The "international travellers"

6. In the year 1956 when the Study Group on International Protection against malaria was convened, malaria eradication campaigns were hardly beginning and obviously the Group concerned itself with the nearest foreseeable danger: that presented by sources of infection introduced into areas from which the spraying would have been withheld after the end of the attack phase. It concerned itself therefore mainly with the consolidation phase and, while it recognized the danger, that migrant groups coming from malarious areas would constitute for the resumption of transmission, it believed that "international travellers"¹ - individuals, couples or families - would not represent such a danger. This opinion is certainly correct for the consolidation phase when surveillance is, as it should be, operating on a total coverage basis. It is, however, questionable whether another study group would today repeat the same statement.

The Study Group of 1956 itself, when stating that "international travellers" should not be "subjected to any special sanitary measure" realized that the introduction of even a single source of infection would be "of much greater significance where eradication is well under way or has been accomplished and where vectors remain". It is true that the Group said that "there would usually be ample time for a 'competent surveillance system' to maintain control of the situation". But since 1956 experience has taught that it is very difficult to find malaria eradication programmes with fully satisfactory surveillance operations; further, since 1956, many have entered maintenance during which a competent surveillance system is replaced by vigilance which is then the only mechanism of protection. Vigilance, as we know, is carried out by the general health service, because the NMES no longer exists; it is, at best, passive detection carried out mostly by polyvalent health staff.

It is likely therefore that vigilance would never be so efficient

¹ In 1958, the Director-General of WHO requested information from the various governments on the measures and requirements that they had decided to apply for inter-national protection against malaria. None of the replies indicated that sanitary measures against "international travellers" had been taken or were envisaged. In 1958, however, no country was recorded as having reached the maintenance phase and the areas under consolidation had a total population of 65 million. In 1961 there were 39 countries with areas containing 305 million population under maintenance, while the total population under consolidation was 83 million.

in detecting and dealing with sources of infection as surveillance. Further, in formerly malarious countries, malaria tends to be forgotten by medical practitioners. An impressive example of this trend was given by the death of the Italian cyclist Fausto Coppi who died of a falciparum infection contracted in the Voltaic Republic and undiagnosed until it was too late. Another example may be found in Germany: out of 27 malaria patients hospitalized during the last few years in the Bernhard Nocht Institute, Hamburg, a large proportion of them had been sent with a wrong diagnosis, although all of them came from the tropics (Mohr, W. & Peltzer, F. (1961) Dtsch. med. Wschr. 86, 2148).

In order to prevent the danger to which this paper is devoted, it appears therefore necessary to ensure that medical practitioners think of malaria when a patient reports to them after having lived in, or visited, malarious areas; and to train medical students in the diagnosis of the infection, until malaria has disappeared from the world.

It is recognized that the "international traveller" who lives in towns, comes from and goes into a town, would generally, not be dangerous even if surveillance - or vigilance - are poor, for most towns have no vectors (except some semi-rural or garden towns, where breeding places may occur in the urban area). But in recent times some types of "international travellers" are becoming more and more numerous, who may live at home in a rural area and work abroad in rural areas. We have in mind veterans from tropical countries and veterans from services other than army services; persons returning home from tropical areas where they have served on short or long contracts or activities; students from malarious countries who go to study and spend their vacations in other countries, quite possibly in areas where transmission may occur. The most typical example was probably that of the United States Korea veteran and of the Camp Fire Girls, where 35 of the latter were infected, the source of infection not having been detected by the health services before the first secondary cases had occurred.

7. If one tries to visualize and evaluate the danger of the introduction of a source of infection into an area unprotected by total coverage measures (spraying or mass drug administration) and formerly malarious, various possibilities may be considered:

- (a) if the source of infection is introduced into areas from which vectors are absent, (as in most towns, even in tropical areas) or from which they have been eliminated, obviously the source would not represent a danger of renewal of transmission;
- (b) if the source of infection enters an area during the non-transmission season, it would not be dangerous, but it might become dangerous when the transmission season begins, unless it has been previously cured by radical treatment,

(c) if a source of infection comes into an area where vectors are present and environmental conditions are favourable to transmission, the danger varies as follows:

(i) if, prior to the attack phase, the area had stable malaria, the source can give rise to an epidemic outbreak, unless the source or at least the secondary cases have been detected and dealt with in time;

(ii) if, prior to the attack phase, the area was one of unstable malaria, and if the environmental conditions at the moment of the arrival of the source of infection are such as to favour a high reproduction rate, then, unless the source, or at least the first secondary cases, are detected and dealt with in time, an epidemic outbreak would be possible,

(iii) if, prior to the attack phase the area was one of unstable malaria, but the environmental conditions of the locality are such that transmission of malaria would be difficult or at least the reproduction rate would be very low, then the introduction of the source would not be dangerous, as it could give rise to, at most, a few secondary cases, easily detectable before a new crop of tertiary would take place, if ever.

8. In the worst possibilities mentioned in the preceding paragraph, during consolidation, an appropriate surveillance could prevent the danger of an epidemic outbreak. In the maintenance period, however, vigilance would have to be extremely efficient to reach the same result. It seems therefore strongly advisable to try and ensure that the source of infection is detected, as soon as possible, by some additional approach. In other words, that the potential source of infection be detected at its entry into the country.

Even when surveillance and vigilance are very efficient any malaria case detected requires an epidemiological investigation, which sometimes taxes the personnel severely, as it is time-consuming and consequently costly. If the malaria case discovered is "indigenous", the search for its likely origin may be very difficult; it would of course be much facilitated if all the suspected sources of infection of the locality were known.

The following example from Lebanon is instructive. On 22 August 1961 a positive slide for p.vivax was obtained by surveillance agents. It belonged to a tractor driver of a village near Zahlé (Beqaa). Epidemiological investigation showed this to be a primary attack, not a relapse; that he could not have contracted the infection in his village, and the subject had recently spent a few weeks in another village, Baktouta. An epidemiological unit then had to visit - for a week - this village and two other villages nearby, where 127 houses were examined and blood was taken from 242 inhabitants, i.e., 30% of the total population, all with negative

results. Entomological investigations were also carried out in the villages and the surrounding territory: the results were against the possibility that the subject might have contracted the infection in that area. The subject, however, had been working for some time in Syria, from May to the beginning of July, and it was concluded that he had probably contracted the infection there. (Rapport Trimestriel, 3ème trimestre, 1961, Liban 7). One wonders whether a system of registration at entry into the country could not in this case have spared some work to the surveillance personnel, and perhaps have detected the malaria case some days earlier.

9. It is felt that the general principle to be followed could provide for suspected sources of infections to be identified and registered by the appropriate authorities as soon as they contact them - either to the frontier base or to the first immigration control at the borders - so that they can be followed up and appropriately dealt with. A suspected source of infection might be defined as any person who within, let us say, the last two years has spent at least one night outside the country in a locality where malaria transmission occurs.

10. The identification of suspected sources of infection according to the above tentative definition seems inapplicable, as it would imply that frontier or immigration officers should be regularly informed of all localities - let us say districts - of the world, where transmission occurs or occurred during the last year or two. The concept of the suspected source of infection might therefore be broadened to include anybody who has been, for at least one night, during, let us say, the last two years, in countries other than those which have never been malarious, or which have eradicated malaria or which were in the consolidation phase before the subject stayed there.

With such a broad definition it should be possible for WHO to transmit to national governments and for these to circulate to all frontier posts and officers (of the countries needing protection against reintroduction of transmission) the list of the countries indicated above.

11. The method which may be suggested would consist of a procedure comparable to that of "medical surveillance"¹ (the adjective medical is added in order not to confuse this type of surveillance with that which is a constant component of a malaria eradication programme) which is

¹ It is recollected that to enforce medical surveillance in the quarantinable diseases national legislation is necessary (Int. San. Reg. p. 20, footnote). Article 27 of the Regulations states:

"1. A person under surveillance shall not be isolated and shall be permitted to move about freely. The health authority may require him to report to it, if necessary, at specified intervals during the period of surveillance. Except as limited by the provisions of Article 69, the health authority may also subject such a person to medical investigation and make any inquiries which are necessary for ascertaining his state of health.

2. When a person under surveillance departs for another place, within or without the same territory, he shall inform the health authority the place to which the person is proceeding. On arrival, the person shall report to that health authority which may apply the measures provided for in paragraph 1 of this Article".

authorized in particular instances when dealing with five of the six quarantinable diseases, by the International Sanitary Regulations. The suspected or potential sources of infection, when identified by the appropriate authorities should be registered. Registration would imply:

- (a) informing the health authority of the locality to which the traveller intends to proceed;
- (b) the obligation for the traveller, should he fall ill with fever, to report to the nearest doctor, or dispensary, or health authority, to consent to have his finger blood taken for examination and to follow the treatment indicated.

12. A similar procedure, if applicable, would not delay traffic and would not cause any undue discomfort to travellers. Contrary to the provisions for medical surveillance in the quarantinable diseases, they would not necessarily be required to report to anybody, unless they get fever. In the latter case, visit and antimalaria treatment should of course be free. It would be enough for such travellers to inform, at the most, the local health authority of the place they proceed to, by posting one of a number of ad hoc postcards handed to them at the frontier post.

13. By a mechanism of this nature, the international traveller who may be a source of infection would become aware, at his entry into the country, that he may constitute a danger of re-establishing malaria transmission, and would be instructed in what he should do in order to ensure that he will be detected by the health authorities should his danger materialize. Consequently he would not escape detection and appropriate treatment, even if surveillance, and particularly vigilance were not fully efficient.

14. Were malaria included in the list of quarantinable diseases, one would think that the Article 27 provisions would perhaps exceed the needs. On the other hand, the short duration of medical surveillance now approved (a maximum of five days for cholera, six for plague, eight for relapsing fever, and fourteen for smallpox or typhus) should be very much exceeded. In the new quarantinable diseases the duration of medical surveillance is conditioned by the incubation period: in malaria it should be governed by the probable duration of the infection - by the administration of radical treatment, by the epidemiological conditions of the area and of the season as outlined in section 6.

15. It is realized that the above sketched procedure might be very difficult in many developing countries, particularly in the African continent owing to the great mobility of the population, not limited to controllable roads. In such cases one would think of the possibility of administering radical treatment to any person coming to a village from outside the protected area. This would well be feasible where falciparum infections largely prevail, and, of course, very difficult where *P. malariae* or *P. vivax* are present as in the latter case a weekly 8- and 4-aminoquinoline association for eight weeks, or a longer protracted suppressive treatment, would be required.

B. Introduction of Vectors

1. Resumption of malaria transmission may also follow introduction of mosquito vectors, or more probably, of particular species or of particular strains (for instance insecticide-resistant ones) should sources of infection be available. While in part A it has been explained that the entry of suspected sources of infection cannot be prevented and that it is the re-establishment of transmission that must be prevented from the sources introduced - in the case of dangerous vectors all efforts should be directed to oppose their penetration into the country.

It is realized that no defence can be opposed against the long distance migratory flights of some vectors - like those described for A. pharoensis when large groups of mosquitos among which may be included some infected females, cross distances of scores of kilometres (see Garrett-Jones, WHO/Mal/298, 2 June 1961). But for mosquitos crossing the borders of a country on their own wings, and resting within a few miles from their departing place; or for mosquitos being passively transported, for long or short distances by land, sea, or air, a defence can certainly be organized to prevent their entry into the receptive country.

2. The 1956 Study Group concentrated its attention on the danger that might follow the introduction of:

- (a) vectors in areas where they do not naturally exist;
- (b) vectors belonging to a species much more potent than the locally present vector species;
- (c) vectors resistant to insecticides.¹

3. During the last years two new possibilities have materialized. One is the apparent eradication of the vector species after residual spraying. We say apparent eradication because in a malaria eradication programme means and personnel for actually searching for specimens of the species all over the country (as it should be done in vector species eradication programmes) may not exist. Then, it may well be that in spite of the apparent absence of vectors, they still remain in isolated pockets and escape notice, but when spraying is withheld they will build up their population anew. This would represent no danger if the parasite reservoir is empty.

The second possibility, which has drawn the greatest attention in

¹ A possible example of the importation of a strain of dieldrin-resistant A. gambiae, into an area of Southern Cameroun from which this species had been eliminated, was reported by Garjou & Mouchet (1961). The discovery of A. gambiae was associated with a malaria outbreak. (Garjou, J. & Mouchet, J. (1961) Bull. Soc. Path. exot. 54, 870)

savannah areas of Africa south of the equator, is the disappearance of the endophilic-anthropophilic A.gambiae population, with the persistence of the exophilic and zoophilic one, as a consequence of house spraying. The reintroduction of the first strain would not be dangerous during the attack phase, but could be dangerous during consolidation, when some malaria cases could still persist. It should not be dangerous during maintenance, but it is difficult, at present, to imagine any area in tropical Africa without any sources of infection, unless it is an island or unless eradication programmes develop simultaneously over many countries, as is desirable in the future. These two possibilities further support the opinion of the Committee on International Quarantine (CIQ) "that the health administration of any country where malaria is present or could develop may need to take measures against the introduction of foreign species of dangerous vectors as well as of insecticide-resistant species".

It may be appropriate to quote here the recommendations of the Fifth Report of the CIQ concerning the introduction of vector anophelines, particularly those resistant to insecticides, into susceptible areas.

"The strongest defence against the carriage of mosquitos by sea or air is the rigid protection of seaports or airports by antimosquito measures and the Committee endorses the recommendation of the Study Group on International Protection against malaria that health administration concerned 'should be asked to take all reasonably possible steps to this end'.

As regards the importation of insect vectors, the Committee is of the opinion that disinsectization of aircraft may be required. Article XVII, paragraph 2, of the International Sanitary Convention for Aerial Navigation of 1944 was excluded from replacement by Article 105 of the International Sanitary Regulations and therefore remains in force for those countries party to that Convention. This paragraph is worded as follows:

'In view of the special risk of conveying insect vectors of malaria and other diseases by aircraft on international flight, all such aircraft leaving affected areas will be disinsected. Notwithstanding the terms of Article 54 of the 1933 Convention as hereby amended,¹ further disinsectization of the aircraft on or before arrival may be required if there is reason to suspect the importation of insect vectors.'

The Committee is of the opinion that subject to the provision of Articles 25, 28, 40 and other articles of the International Sanitary Regulations applicable to diseases other than the quarantinable

¹ As modified by Article XVII of the International Sanitary Convention for Aerial Navigation of 1944.

diseases, States not party to that Convention also have the right to require disinsectization of aircraft on or before arrival if there is reason to suspect the importation of insect vectors. The formulations and methods of disinsectization to be applied are those recommended by the Expert Committee on Insecticides. (The current recommendations are contained in the seventh report of the Expert Committee on Insecticides.¹).

The Committee is of the opinion that subject to any agreements in force between States, disinsectization of other modes of transport on arrival may be required but this right should be exercised only if there is reason to suspect the importation of insect vectors of diseases."

Notwithstanding the statement that "the strongest defence against the carriage of resistant mosquitos by sea or by air lies in the rigid protection of sea- and air-ports", too many international airports, in 1961, could not be regarded as satisfactory from the standpoint of mosquito vectors of human diseases (other than *Aedes aegypti*). This was stated in a circular letter of the World Health Organization Director-General to all governments (C.L.14, 5 May 1961) where it was also stated that "the transporting of dangerous mosquitos to receptive areas continued to be a constant and serious danger". This circular letter further requested governments to provide to WHO quarterly reports on the mosquito situation of international airports. Presence of mosquitos in the international airports makes disinsection of aircraft necessary. Now disinsection in the air is definitely rejected, while "blocks away" disinsection has been recommended by the Eleventh Report of the Expert Committee on Insecticides as an interim procedure, "pending the possible introduction of improved procedures" (C.L.14, 1961) as stated by the CIQ in its Eighth Report.

4. The Fifth Report of the CIQ also recommended that WHO "should encourage and help studies on the subject of possible sources of origin of resistant vectors and maintain a register of areas in which resistant anophelines occur, with data on their resistance and susceptibility to different insecticides". It is known that WHO has been fulfilling this request and at least annually a list of the present status of resistance, species, area and insecticides is circulated.

5. In reply to the request for information from governments sent by the World Health Organization Director-General in 1958, many governments stated that they would require aircraft to be disinsected, so as to prevent importation of malaria vectors, either on arrival or before departure. Some governments were of the opinion that additional regulations were needed

¹Wld Hlth Org. techn. Rep. Ser. 1957, 125, and Annex V to the Annotated Edition (1957) of the International Sanitary Regulations.

chiefly concerning the prevention of importation of malaria vectors and the aircraft disinsection. Most governments, however, indicated that there was no need for additional regulations, amending the International Sanitary Regulations (HOOD, Working Paper for the Tangier Conference).

C. The Present Situation

1. In the Fifth Report, the CIQ was aware of the practical and scientific difficulties in the application of the recommendations of the Study Group, but for the time being, it agreed with them. It stressed, however, the necessity for their continuous review in the light of future knowledge and experience gained from their application (p. 19, end of para. 1).

The Committee further requested the Director-General to collect information from all appropriate sources on the working of the measures outlined "... in order that the need for and practicability of additional regulations in respect of malaria can be considered at a future meeting of the Committee".

2. In the Ninth Report, the CIQ adopted the following recommendation:

"The Committee recommends that the World Health Assembly request the Director-General to convene at an early date an appropriate meeting of malaria and international quarantine experts to review the situation of international protection against malaria. It further recommends that these experts examine, inter alia, the following:

(a) the application of recommendations made by the 1956 WHO Study Group on International Protection against Malaria and the adequacy of these recommendations under present conditions;

(b) the adequacy of present provisions of the International Sanitary Regulations, including previous interpretations and recommendations of this Committee subsequently adopted by the World Health Assembly, in respect of international protection against malaria;

(c) the adequacy of present methods for collecting and disseminating information on:

- (i) the existence of malaria cases;
- (ii) areas where insecticide-resistant vectors are present; and
- (iii) aircraft disinsection practices."

SUMMARY

1. As regards the introduction of sources of infection, it has been suggested:

(a) that the danger constituted by migrants, seasonal workers and people participating in periodic aggregations, should be fully studied in the planning stage, the appropriate planned measures should be started during the preparatory phase and that the method recommended by the Seventh Report of the Expert Committee on Malaria could go a long way towards solving the problem;

(b) that the statement that international travellers do not represent a danger of renewal of transmission should be re-examined as regards their arrival during the maintenance period and, should they be a cause of concern, that the possibility of some system of "medical surveillance" might be considered.

2. As regards the introduction of vectors, it has been noted:

(a) that many international airports are not yet free of mosquitos;

(b) that, when relevant, the disinsection before departure is therefore necessary wherever potent malaria vectors, insecticide-resistant or other dangerous vector strains are present, and

(c) that the method of "blocks away" disinsection has now been recommended.

3. Finally, the recommendation of the last (ninth) report of the Committee on International Quarantine, that WHO convene another Study Group on International Protection against Malaria, has been quoted.