



ADVISORY GROUP ON MALARIA ERADICATION STRATEGY

Geneva, 17-21 March 1969

INDEXED

SUMMARY AND PRELIMINARY CONCLUSIONS OF THE STUDY UNDERTAKEN
TO DETERMINE THE VALUE OF THE VIGILANCE SYSTEMS AT PRESENT BEING APPLIED
IN THE COUNTRIES OR SECTORS IN THE MAINTENANCE PHASE

This study, conducted from October 1968 to March 1969, was carried out by a WHO team consisting of a malariologist and a public health administrator**. It covered a number of countries belonging to various regions and had the specific objectives of:

- (a) assessing in each country the organization and facilities available and their utilization for the maintenance of achieved eradication;
- (b) reviewing the effectiveness of the existing organization in maintaining eradication in the light of the prevailing epidemiological situation and the other priority health needs of the country; and
- (c) appraising the training of the staff and the strength of the public health epidemiological services.

The basic data and observations relating to the various systems studied, together with the preliminary conclusions, are summarized below:

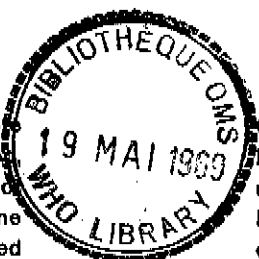
1. BASIC EPIDEMIOLOGICAL INFORMATION

This information is summarized in Table 1. In all the countries studied, the minimum period of operation of the vigilance system taken into consideration for the study was three years. Out of the nine areas studied, the average malariogenic potential, which is the resultant of the degree of receptivity together with the degree of vulnerability, was considered in six cases as low and in three as moderate. It emerges from these observations that the test of the adequacy of the systems, studied under these particularly favourable epidemiological conditions, is not absolutely conclusive in case of success. These conditions are probably attributable to the fact that malaria eradication has been most often achieved in places where the malariogenic potential is at present low or moderate. Out of the nine areas studied, success in maintaining malaria eradication as shown by lack of evidence of resumption of transmission, was found to have been achieved in five (Macedonia, Trinidad, Jamaica, Kerala and Madras) and failure was recorded in four (Tobago, Ceylon and two districts in the State of Uttar Pradesh).

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TABLE NO 1 BASIC EPIDEMIOLOGICAL INFORMATION

	Observation period	Population concerned in the study	Average receptivity	Average vulnerability	Malarigenous potential	Resumption of transmission
MACEDONIA	1965-1968	1 406 000	medium	low	low	nil
TRINIDAD AND TOBAGO	1965-1968	748 456	medium medium	low low	low low	nil medium
JAMAICA	1965-1968	1 609 814	medium	low	low	nil
CEYLON*	1964-1967	1 939 845	low	high	medium	medium
INDIA:						
KERALA (KOZIKHODE DISTRICT)	1964-1968	2 710 406	medium	low	low	nil
MADRAS (NORTH ARCOT DISTRICT)	1964-1968	3 570 000	medium	medium	medium	nil
UTTAR PRADESH:						
1. BARABANKI DISTRICT	1965-1968	1 380 000	low	low	low	low
2. RAEBARELI DISTRICT	1965-1968	1 411 543	medium	medium	medium	medium

* Situation existing at 1966.

2. BASIC INFORMATION ON THE PUBLIC HEALTH SERVICES (see Table 2)

(a) With the exception of Jamaica, where planning is in its early stages, the other countries have a national health plan, constituting one sector of an economic and social development plan. These plans are not always very fully worked out and in particular not always fully applied, as the legislative machinery and provisions necessary for their implementation are usually lacking. The priorities laid down are generally based on ill-defined criteria, but the fact remains that malaria, after ranking as top priority during the attack and consolidation phases, has slipped back to second place behind maternal and child health, a term which, in fact, generally covers family planning activities: this is the position in Ceylon and India (in Uttar Pradesh malaria even ranks third after medical and paramedical education). In Macedonia the term "maternal and child health" really does refer to activities in that field, aimed at reducing the infant mortality rate which is still high. In this second position in the order of priorities malaria features, moreover, only as one among all the other communicable diseases, sometimes "primus inter-pares".

Meanwhile, paradoxically, a considerable effort is still being devoted to malaria in the budgetary field, taking into account the resources of these countries. Even if that effort is still inadequate, it is invariably greater than the effort devoted to the development of the basic health services; these generally rank only about fifth. In Trinidad and Tobago, malaria, as also smallpox and yellow fever, is not included in the list of priorities, because there were "no cases of deaths due to these causes during the period when the plan was prepared." Nevertheless, high priority is assigned to the specific activities necessary for the maintenance of malaria eradication and the effort being made from the budgetary point of view is out of proportion to the objective to be attained, though it is impossible to distinguish the amounts allocated respectively to malaria and to the control of Aedes aegypti in their joint budget for these activities.

(b) It is particularly striking, with all the talk about integration of specialized mass campaigns into general health services, to note how rarely and incompletely preventive and curative activities are integrated within these services. It might seem paradoxical to try to integrate something into something which is itself not integrated. It is not, however, impossible, and is even a commonly observed fact, for passive malaria case detection may be integrated into the activities of curative institutions (dispensaries or hospital out-patient departments), while active case-finding may constitute part of the duties of the staff of preventive institutions (health centres), but this practice is certainly not to be recommended, for the usual difficulties inherent in supervision - so important and so often inadequate - are aggravated by the serious disadvantages of parallel supervision and a dual authority.

(c) The coverage of the population by the basic health services is, except in Macedonia, inadequate. This inadequacy is due to five factors:

- the number of preventive and curative institutions involved in case detection;
- the geographical distribution of those institutions in relation to the distribution of the population;
- the numbers of personnel available;
- the training of that personnel, more particularly for vigilance activities;
- the organization and administration of the available services.

TABLE NO 2 BASIC INFORMATION ON PUBLIC HEALTH SERVICES

	Priority given to malaria in the national health plan	Integration of preventive and curative medicine		General health services coverage				Budget for maintenance		
		Degree	Levels	In space	In time	General public health services staff		Quality of coverage	Malaria	GPHS
						1	2			
MACEDONIA	second	Total	all	adequate	adequate	adequate	adequate	adequate	adequate	
TRINIDAD & TOBAGO	high (unlisted)	Nil	-	adequate	inadequate	inadequate	adequate	adequate	adequate	
	high (unlisted)	Nil	-	adequate	inadequate	inadequate	inadequate	inadequate	inadequate	
JAMAICA	No plan	Nil	-	adequate	inadequate	inadequate	inadequate	inadequate	inadequate	
CEYLON	second	Partial	Inter-mediate and peripheral	adequate	inadequate	inadequate	inadequate	-	-	
KERALA	second	Partial	all	inadequate	inadequate	inadequate	inadequate	inadequate	inadequate	
MADRAS	second	Partial	peripheral	inadequate	inadequate	inadequate	inadequate	adequate	inadequate	
UTTAR PRADESH	third	Partial	peripheral	inadequate	inadequate	inadequate	inadequate	inadequate	inadequate	

1. Quantity.

2. Training for vigilance.

Briefly, it can be stated that the criteria for total coverage are met in Macedonia. In the islands (Caribbean and Ceylon), the coverage is inadequate because of deficiencies in the number and level of training of the staff as also in the organization and administration of the available facilities. In the three Indian States, the cause of the inadequate coverage lies in the number of health institutions, their poor geographical distribution, and the number and level of training of the staff.

2.1 General epidemiological services

The data concerning these services are summarized in Table 3.

TABLE NO. 3

	Organizational levels	Personnel		Standard of services
		Quantity	Qualifications	
Macedonia	all	adequate	adequate	adequate
Trinidad and Tobago	none	-	-	-
Jamaica	none	-	-	-
Ceylon	central only	adequate	adequate	adequate
Kerala	intermediate	inadequate	inadequate	?
Madras	none	-	-	-
Uttar Pradesh	central and intermediate	inadequate	?	?

This table speaks for itself. In Macedonia, the general epidemiological service exists and has an adequate structure. Everywhere else in the countries visited, even if it is provided for in the national plan, this service does not yet exist or consists of a central section which is sometimes beginning to ramify at the intermediate level but has no lower level with a structure enabling it to do useful epidemiological work.

The authorities are not unaware of this deficiency but its full importance is perhaps not appreciated. The specialized services (malaria, tuberculosis, leprosy, etc.) do their own epidemiological work, not always very satisfactorily, and the intention is generally to develop a general epidemiological service either on the basis of one of them - usually the malaria services - or by merging them together. The importance of sound epidemiological training is perhaps not fully realized by the health authorities of these countries.

3. PRESENT ARRANGEMENTS FOR EFFECTIVELY ENSURING THE MAINTENANCE OF MALARIA ERADICATION

3.1 Integration of the national eradication service and the general public health services.

The data on this subject are summarized in the following Table:

TABLE NO. 4

	Levels of integration into the general public health services	Degree of integration at the levels concerned	Personnel integrated		Supervision of the vigilance activities integrated into the general public health services
			quantity	public health training	
Macedonia	all	total	adequate	adequate	adequate
Trinidad	none	-	-	-	-
Tobago	none	-	-	-	-
Jamaica	none	-	-	-	-
Ceylon*	none	-	-	-	-
Kerala	all	total	inadequate	inadequate	inadequate
Madras	intermediate and peripheral	partial	inadequate	inadequate	inadequate
Uttar Pradesh	all	partial	inadequate	inadequate	inadequate

* Situation that existed during the maintenance phase from 1964 to 1967.

This Table corresponds in general to what might have been expected from an examination of Table No. 2. Thus Trinidad and Tobago, Jamaica and Ceylon, at the time when certain zones had entered the maintenance phase, did not integrate their vigilance activities with the general public health services and this, considering the level of development of the basic health services, would seem to have been justified. In contrast, Macedonia is a good example of the advantages offered by integration of the vigilance activities into a well-developed network of basic health services.

In the three States of India, integration is partial, either because it has been effected at certain levels only, or because it has been done at all levels but to a limited extent in respect of polyvalence.

Since immediate and complete integration cannot be recommended there either, in view of the level of development of the basic health services, the partial and gradual attempts being made at controlled development of polyvalence in the functions of the basic health workers are worth following with close attention.

The training of workers coming from malaria services to perform other functions in other public health fields has hitherto left much to be desired. It is mainly confined to in-service training in the field.

3.2 Vigilance systems at present in force in the countries studied

The characteristics of these systems are shown in the following Table:

TABLE NO. 5

	Passive case detection		Active case detection and frequency		Meets the requirements of the epidemiological situation	Adapted to the level of the general public health services
	integrated	not integrated (activated)	integrated	not integrated		
Macedonia	yes	-	-	-	yes	yes
Trinidad	-	yes	-	biennial	no	yes
Tobago	-	yes	-	biennial	no	yes
Jamaica	-	yes	-	-	yes	yes
Ceylon	yes	-	-	-	yes	yes
Kerala	yes	-	monthly	-	yes	yes
Madras	-	yes	-	monthly	yes	yes
Uttar Pradesh	yes	-	monthly	-	yes	yes

It is noteworthy that in all the countries studied the system adopted is suited to the present level of development of the general health services and that there is only one country (Trinidad and Tobago) where it does not meet the epidemiological situation. Passive case detection, which has been completely activated in three countries or areas (Trinidad and Tobago, Jamaica, and Madras) exists in all those studied. Out of the four countries or areas in which it has been adopted, active case detection has been integrated into the preventive services in only two (Kerala and Madras).

3.3 Data concerning the evaluation of the present overall organization of the vigilance services

These data are summarized in Table 6.

It is noteworthy that in all the countries studied the main vigilance activities have been adequately planned. The same does not, however, apply to the following activities: entomological observation and health education, the planning of which is inadequate in all the countries. Entomological activities are either non-existent or inappropriate. This is a major gap considering the essential role they have to play in the determination of receptivity. The same applies to health education, which is indispensable for keeping alive both among the public and in the medical profession the idea of a possible return of malaria and the desirability of vigilance measures. The arrangements made for supervision, particularly at the most peripheral level, are considered inadequate in three cases (Ceylon, Kerala and Uttar Pradesh).

TABLE NO. 6 EVALUATION OF THE PRESENT OVERALL ORGANIZATION OF THE VIGILANCE SERVICES

	Notification of cases	Epidemiological investigations	Entomological observations	Examination of slides and laboratories	Cross-checking of slides	Machinery of remedial measures	General supervision of vigilance activities	Health education
MACEDONIA	adequate	adequate	inadequate	adequate	adequate	adequate	adequate	inadequate
TRINIDAD & TOBAGO	adequate	adequate	inadequate	adequate	adequate	adequate	adequate	inadequate
JAMAICA	adequate	adequate	inadequate	adequate	adequate	adequate	adequate	inadequate
*CEYLON	adequate	adequate	inadequate	inadequate	adequate	adequate	inadequate	inadequate
KERALA	adequate	adequate	inadequate	adequate	adequate	adequate	inadequate	inadequate
MADRAS	adequate	adequate	inadequate	adequate	adequate	adequate	adequate	inadequate
UTTAR PRADESH	adequate	adequate	inadequate	adequate	adequate	adequate	inadequate	inadequate

*Situation existing in 1966.

TABLE NO. 7 EVALUATION OF VIGILANCE OPERATIONS (a)

	Active case detection		Passive case detection		Slide examination		Supervision of Laboratories and slides	Notification of cases
	Quantitative	Qualitative	Quantitative	Qualitative	Time-lag	Qualitative		
MACEDONIA	-	-	adequate	adequate	adequate	adequate	adequate	adequate
TRINIDAD & TOBAGO	inadequate	inadequate	inadequate	inadequate	inadequate	adequate	inadequate	adequate
JAMAICA	-	-	adequate	adequate	adequate	adequate	adequate	adequate
CEYLON*	-	-	inadequate	inadequate	inadequate	adequate	inadequate	adequate
KERALA	inadequate	inadequate	inadequate	adequate	adequate	adequate	adequate	adequate
MADRAS	adequate	adequate	inadequate	inadequate	adequate	adequate	adequate	adequate
UTTAR PRADESH	inadequate	inadequate	inadequate	inadequate	adequate	inadequate	inadequate	adequate

* Situation existing in 1966.

TABLE NO. 8 EVALUATION OF VIGILANCE OPERATIONS (b)

	Epidemiological investigations		Application of remedial measures		Entomological observations		Health education
	Time-lag	Qualitative	Time-lag	Qualitative	Quantitative	Qualitative	
MACEDONIA	adequate	adequate	adequate	adequate	inadequate	inadequate	inadequate
TRINIDAD & TOBAGO	adequate	adequate	adequate	adequate	inadequate	inadequate	inadequate
JAMAICA	adequate	adequate	adequate	adequate	inadequate	inadequate	inadequate
CEYLON*	adequate	inadequate	adequate	inadequate	inadequate	inadequate	inadequate
KERALA	adequate	adequate	adequate	adequate	inadequate	inadequate	inadequate
MADRAS	adequate	adequate	adequate	adequate	inadequate	inadequate	inadequate
UTTAR PRADESH	adequate	inadequate	adequate	inadequate	inadequate	inadequate	inadequate

* Situation existing in 1966.

4. EVALUATION OF VIGILANCE ACTIVITIES

This is summarized in Tables 7 and 8.

Out of the four countries or regions where it exists (Trinidad and Tobago, Kerala, Madras and Uttar Pradesh) active case detection was considered adequate only in one (Madras). Passive case detection, which operates in all the countries and regions, is considered satisfactory only in two (Macedonia and Jamaica), slide examination only in four cases (Macedonia, Jamaica, Kerala and Madras), and supervision of laboratories and slides only in four cases (Macedonia, Jamaica, Kerala and Madras).

Epidemiological investigations and application of remedial measures are considered adequate in five cases (Macedonia, Trinidad and Tobago, Jamaica, Kerala and Madras).

Since entomological observations and health education have not been planned correctly their implementation is not satisfactory in relation to the vigilance requirements.

5. MEASURES TO PREVENT REINTRODUCTION OF MALARIA INTO THE COUNTRIES

These measures are summarized in the following Table:

TABLE NO. 9

	Information from national or international sources	Screening of visitors suspected of being infected	Coordination with the immigration services	Warning to international travellers arriving in the country
Macedonia	inadequate	yes	no	no
Trinidad and Tobago	inadequate	yes	no	yes
Jamaica	inadequate	yes	yes	no
Ceylon	inadequate	yes	no	no
Kerala	inadequate	yes	yes	yes
Madras	adequate	yes	yes	yes
Uttar Pradesh	adequate	yes	yes	no

It was observed that an effort is being made in all cases to take certain measures calculated to prevent the reintroduction of malaria. In particular, individuals considered suspect because they come from infected countries or regions are given a blood examination.

The responsible officials of the vigilance services at the intermediate or peripheral levels are not adequately informed about the epidemiological situation obtaining in neighbouring districts or countries, particularly with regard to the trend in malariogenic potential.

International travellers liable to contract malaria or import it into the area are given a systematic warning in only three cases (Trinidad and Tobago, Kerala and Madras).

6. FACTORS ENSURING THE SUCCESS OF VIGILANCE

6.1 The level of malariogenic potential, which was found low or moderate where maintenance of eradication is considered a success, has certainly contributed in some measure to that success (Macedonia, Trinidad, Jamaica, Kerala and Madras). In Trinidad, this factor no doubt explains the success of vigilance despite the many inadequacies observed in the machinery for it.

6.2 The level of development of the general public health services was the main factor in success of vigilance in Macedonia, in particular the complete integration of preventive and curative medicine and the existence of a good general epidemiological service. In Trinidad and Jamaica, this factor was a secondary one, the vigilance system in force not being integrated with the general public health services but only utilizing their physical facilities. In the States of Kerala and Madras, this factor cannot have affected the success of vigilance, for the development of the general public health services is inadequate for vigilance requirements.

6.3 The existence of a vertical organization not integrated with the general public health services was an important factor of success in three cases out of five (Trinidad, Jamaica and Madras) where the experienced malaria eradication staff as well as the considerable independent means of action have been retained.

6.4 The sound functioning of laboratories, speed of notification of cases, promptitude and high standard of epidemiological surveys, and speed and effectiveness of remedial measures have been important factors in the success of vigilance. They have probably made the biggest contribution to success in those cases where inadequate case detection was associated with a low malariogenic potential (Trinidad and Kerala).

7. FACTORS IN THE FAILURE OF VIGILANCE

7.1 Inadequacies in the planning of vigilance was a contributory factor to failure in only two cases (Tobago and Ceylon).

7.2 Inadequate development of the general public health services contributed to the failure of vigilance only when the vigilance system was integrated into those services (Uttar Pradesh). In that particular case, it was responsible above all for the inadequacy of passive and active case detection, which are the most highly integrated operations. The other vigilance operations, which depend on less highly integrated mechanisms, are less affected by that inadequacy.

7.3 Lack of coordination between the national malaria eradication service and the general public health services was a cause of failure only in one country (Ceylon).

7.4 Inadequacy of case detection (passive and/or active), usually due to inadequate supervision, was one of the main causes of failure in three cases (Ceylon, Tobago and Uttar Pradesh).

7.5 Inadequate laboratory organization or errors in slide examinations contributed to the failure of vigilance in the three above mentioned cases.

7.6 The deficiencies noted in the conduct of epidemiological surveys in two cases (Ceylon and Uttar Pradesh) were another cause of failure.

8. GENERAL CONCLUSIONS

The value of the general principles relating to the technical, operational and administrative requirements for maintenance of eradication that are set out in the Twelfth Report of the Expert Committee on Malaria¹ has been confirmed by several years' experience of the maintenance phase in the countries studied. However, the application of these principles is attended by a number of difficulties which vary according to the local conditions.

The first of these difficulties concerns the modalities for integration of vigilance activities with the activities of the general public health services. While integration remains desirable and is still the ultimate aim in the longer or shorter run, we must not, on the other hand, try to integrate at all costs and at any time. Haste and lack of planning in this field may lead to disaster. The fact that a malaria eradication programme has reached the maintenance phase does not necessarily mean it should be integrated. If, as is generally the case, the development of the basic health services has not been planned in relation to the requirements of vigilance, a precise and thorough study must be made of the stage of development of those services. The study must cover more particularly the practical application, implementation and effectiveness of the services provided by the various health institutions.

As has been mentioned above, it is recommended a priori that the preventive and curative services be integrated into the general public health services. The fact must, however, be faced that in countries with limited resources where the need for care is increasing and not being met, such integration is liable to take place at the expense of the preventive services, which will be overwhelmed and in the end neglected for the sake of meeting the ever more pressing demand for treatment services. The lack of public-health-mindedness in the medical and paramedical professions is an aggravating factor which it is difficult to remedy.

Under such conditions consideration should be given to limited and progressive integration, based on experiment, entailing the successive addition of further activities to the initial activities of the basic health workers.

Another of the difficulties in the application of these principles is inadequate knowledge of the malarigenous potential and insufficient application of such knowledge. The malarigenous potential, which is the resultant of the receptivity and the vulnerability existing in a given zone, has proved to be a key factor in vigilance strategy. Research on its dynamics has received insufficient attention in most of the countries studied owing to ignorance of the concept itself and of methods for determining its impact. In particular, a better approach should be adopted to the study of receptivity, through the application of clearly defined and practical entomological criteria. The personnel in charge of epidemiology and vigilance services should be better informed of the importance of the concept of malarigenous potential and trained in the new methods for the study of vulnerability and receptivity.

¹ Wld Hlth Org. Techn. Rep. Ser., 1966, 324

Knowledge of the malariogenic potential and of its dynamics should be better applied not only for planning of vigilance activities, but also for their continuous adjustment to the changes that may always occur in the epidemiological situation. In the countries with limited resources, more effective rationalization of vigilance systems on the basis of a thorough study of the malariogenic potential could assist in finding more economical solutions. For example, by giving priority to the development of the basic health services in the zones with very low malariogenic potential, it might perhaps be possible to dispense with active case detection in the regions where it is now needed because of the inadequate development of the health services. Other priority fields of health work would also benefit thereby.