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1. MALARIA SURVEILLANCE IN THE UNITED STATES OF AMERICA

The following note has been extracted from the Malaria Surveillance Report, 1960, prepared by Dr Robert L. Kaiser, then of the Malaria Surveillance Section, Communicable Diseases Center, United States Department of Health, Education and Welfare, Atlanta, Georgia, United States of America.

In the United States, in spite of widespread anophelism, endemic malaria has essentially disappeared. However, an active surveillance programme is continued to assay the cases that still occur and to warn of possible indigenous transmission.

Reported cases of malaria in the United States were over 100 000 with more than 4000 deaths during the mid nineteen-thirties, falling to just over 2000 cases in 1950.

A total of 69 cases was reported to the National Office of Vital Statistics in 1960. The Surveillance Section appraised these cases from the standpoint of clinical, parasitological, and epidemiological documentation and found that 63 cases could be classified as "confirmed" or "presumptive". The other six cases lacked adequate data to indicate malaria as the etiology of the illnesses. In only three of the 63 cases was there any evidence that suggested the disease was of indigenous origin. Evidence of foreign origin was found in the remaining 60 cases.

A case was considered "confirmed" on the basis of a positive blood film as determined by the State health department laboratory or other approved laboratories. A case was considered "presumptive" if clinical and epidemiological evidence suggested malaria but adequate documentation by blood film was lacking.

Of these 63 appraised cases of malaria reported in the United States during 1960, 47 cases were classified as confirmed; 16 were classified as presumptive. Three indigenous cases were reported during the year; these are summarized later in this report. Of the 60 cases of foreign origin, 39 occurred in civilians and 21 in military personnel. Eleven of the infections of foreign origin occurred in visitors to the United States from several other countries. The other 49 cases were found in residents of the United States who had returned from temporary residence or travel in various foreign countries.

Plasmodium vivax was the most frequently encountered parasite and accounted for 49 of the cases. *Plasmodium falciparum* was found in eight patients, and *Plasmodium malariae* in four patients; the species was not determined in the remaining two individuals. The proportion of infections due to *P. vivax* was virtually the same as that observed in 1959 (74 per cent.).

The morbidity curve has levelled off at 60 to 80 cases annually. This morbidity is almost entirely due to infections acquired outside the United States. With the extensive travel between countries, if the status of malaria eradication throughout the world does not markedly change, the present level of occurrence may represent a base line which will fluctuate only slightly.

Cases originated in at least 25 countries; the specific foreign source of another nine was unknown. Of the 21 cases in military personnel, 12 had experienced exposure in South Korea; the remaining 9 occurred in members of the United States Armed Forces who had been stationed in other parts of the world. During 1960, there were no cases of Mexican origin although in each of the past several years, cases of malaria in Mexican farm labourers have been reported. This absence of cases of Mexican origin may reflect results of the eradication programme in Mexico.

Evidence suggests that two cases of malaria were acquired in the United States during 1960. A third case, an infection of *P. malariae* in a 76 year old man, appeared to be a relapse of an earlier acquired indigenous infection. No cases associated with blood transfusions were reported during the year although during 1959 two such cases associated with *P. malariae* had been noted. Summaries of the two indigenous cases occurring in 1960 appear below.

Case 1. A professor of zoology residing in Arkansas was reported as a case of malaria. The patient spent the month of June at Ocean Springs, Mississippi, collecting biological specimens and during this time was frequently bitten by numerous insects. He returned to his home in Arkansas during the second week in July and immediately noted recurrent chills and fever of a tertian pattern. The patient, a parasitologist, examined his own blood smear and found *P. vivax*. He had not been abroad for several years. No other cases were known to have occurred in the area.

Case 2. During July, the Alabama State Department of Health reported a case of malaria due to *P. falciparum* in a 38 year old female. Following an operation in June for removal of a bartholin cyst, the patient developed chills and fever. Because of recent similar symptoms, a blood smear was obtained which revealed *P. falciparum*. The patient had resided in a small town nine miles from Montgomery, Alabama, until January 1960 when she moved to Nashville, Tennessee. She continued to make monthly trips back to Alabama staying as long as a week to ten days on each occasion. Her new home in Nashville was in an urban area whereas her former home in Alabama was rural. Investigation of family contacts and neighbours in Alabama revealed no recent illness and blood films were negative for malaria parasites. *Anopheles quadrimaculatus* mosquitos were found in the area about her Alabama residence. The patient had never travelled outside the United States.

The total number of cases, their epidemiological and parasitological characteristics are similar to the pattern of malaria occurrence seen in the previous two years in the United States.

[The second case of *P. falciparum* infection would appear to be most mysterious. Inquiries were made if any blood transfusion had been given, but this appears unlikely. The possibility of a recent immigrant influx into the area might be considered - Editor.]

2. TRANSPORT MANAGEMENT IN INDIA

In the course of a review on the progress of the National Malaria Eradication Programme of India, the International Co-operation Administration Malaria Advisory Team (Dr Donald Pletsch, Senior Malaria Adviser of the Pan American Health Organization (WHO) in Mexico; Dr F. E. Gartrell, Assistant Director of Health, Tennessee Valley Authority, Chattanooga, Tennessee, United States of America; and Dr E. Harold Hinman, Chief, Technical Resources Division, Office of Public Health, International Co-operation Administration, Washington, D.C.) who visited India September/November 1960 to evaluate the current status of the National Malaria Eradication Programme of India, reported on the transport problems of the NMEP fleet of vehicles and made a number of suggestions for improvement of the running, maintenance and general administration.

It is considered that this report has wider application and we have taken the liberty of extracting from it for the following note.

The National Malaria Eradication Programme of India has a fleet of 2282 vehicles of which 1839 are trucks used principally for transport of materials in support of spraying operations. Trucks are used only to a limited extent for transport of spray crews. The other 443 vehicles, 1/4 ton vehicles and station wagons are used by unit, zonal and state and central staff for general transportation required in the supervision of the malaria eradication activities. One hundred and eighty six 1/4 ton vehicles purchased locally are being added to the fleet during the 1960-61 spraying season.

As the field units were visited, inspections were made of vehicles and of the repair facilities operated by the malaria organization. Information concerning vehicle operating and maintenance problems was solicited from the supervisory staff and from drivers and mechanics To the extent that time was available vehicle operating logs were examined. In addition, detailed information on vehicles was obtained from the units by means of a pro forma circulated by the central and state malaria organizations as requested by the Malaria Advisory team.

The vehicle maintenance problems experienced by many of the units appear to be due to one or more of the following:

1. Lack of a plan for training and periodic check-up of drivers as to safe driving practices and care of the vehicle.

2. Irregular servicing of vehicles.

3. Failure to fill the unit position of mechanic, or filling it with an unqualified person.

4. Lack, at most units, of even minimal shop facilities and tools that would be required for general vehicle maintenance.

5. Undue delays in obtaining spare parts when needed. Delays are frequently due to the involved administrative procedures that have to be followed. However, certain parts are in extremely short supply in India and are exceedingly difficult to obtain.

6. Lack of planned periodic review of the fleet and adjustment of vehicle assignments to equalize use and to utilize available maintenance facilities to best advantage.

The central and state organizations are aware of these problems and are taking steps to develop transport organizations at the state level. Several of the state health services organizations now have transport officers, and in at least two states (Mysore and West Bengal) a start has been made to establish and equip central shops capable of handling major overhauls of the various types of vehicles operated by the Department of Health Services including the malaria eradication organization. The development of a transport organization is more advanced in West Bengal than in any of the other states visited. In West Bengal the central shop is supplemented by four zonal workshops and five mobile workshops. The West Bengal Department of Health Services has a total of 500 vehicles of which 179 are assigned to the malaria eradication programme. The Transport Office of UNICEF has provided assistance to West Bengal in setting up its transport organization and to many of the other states in developing plans for similar set-ups.

Where the long term requirements of the health services organizations indicate the need for it, the states should be encouraged and assisted by the central organization of the NMEP to establish transport organizations as expeditiously as possible. In states where such an organization is not contemplated or possibly may be several years in developing, the malaria organization should establish a transport section to meet its own needs. For the immediate future, in addition to efforts to get fully operating transport organizations established in the states to meet malaria eradication needs, the following steps might be taken to minimize transport problems:

1. Where not already functioning, establish transport officer positions in each of the major states either to serve all health services or to serve exclusively the malaria eradication organization.

2. Establish at the state level a central stores for maintaining a planned inventory of hard-to-get spare parts for all vehicles and to serve as a central purchasing agent for spare parts which units cannot obtain locally. Included in central stores should be a limited number of transmission, differential and motor assemblies to permit unit exchange when major overhauls are required. This should reduce to a minimum the "out of service" time for major overhauls.

3. Pending the establishment of a fully functioning transport organization with static and mobile workshops, fill all mechanic's positions in the units as expeditiously as possible with qualified mechanics and provide shop space and hand tools for repairs of vehicles. When not required for work on vehicles, the mechanic and shop facilities could be used for repair of sprayers.

4. Establish rigid procedures to assure proper servicing of vehicles on schedule.

5. Provide shelters for storage of vehicles where they are not now available.

6. Review all vehicle assignments and make changes which might be indicated on the basis of the following considerations:

(a) Supply low maintenance vehicles to remote areas;

(b) Equalize vehicle use by rotating vehicles between low and high use units;

(c) Assign older vehicles to units having most convenient access to maintenance facilities and to sources of spare parts.

7. Develop specific plans for driver training and closer supervision of driving practices; with emphasis upon safety, vehicle care, and public relations.

3. RIVER IMPOUNDMENT AND PUBLIC HEALTH WITH REFERENCE TO MALARIA

The following extracts have been made from a paper presented by the WHO Secretariat at a Regional Symposium of the Economic Commission for Asia and the Far East, held at Tokyo in September 1961.

> "The impoundment of water behind river dams may, to a greater or lesser degree, affect the health of population groups, either favourably or unfavourably. The economic and social implications of this fact are substantial and their study merits more than casual or transient interest. Poor health, sickness and premature death are costly, not only to individuals or families but to the community and to society as a whole. Conversely, good health and a high level of working capacity among a population are profitable. The engineer and planner responsible for river development should be aware of the nature of the potential hazards and benefits to the public health associated with water impoundments, and the health factors should be studied and evaluated from the earliest planning stages to avoid the hazards and to grasp the greatest possible benefits.

In considering the public health aspects of the problem, there are three principal areas which require study, namely, domestic water supply, mosquito breeding potentials and the relative probability of developing other aquatic vectors of disease.

Most member countries of ECAFE where malaria is a hazard are combatting this disease with the eventual aim of eradicating it. This campaign is based today largely on the use of chlorinated hydrocarbon insecticides directed against the adult anopheline mosquitos. To a smaller extent the campaign is based upon the use of other measures. . .

... Despite the widespread applicability of residual insecticides in the malaria eradication programme, there are some situations where they do not work, or where, for certain reasons, their effectiveness is lowered. There are also situations where other measures are equally effective and cheaper. The overall programme to eradicate malaria depends upon the perfection in coverage, but it is not necessarily tied to one single measure. Wherever the interruption of malaria transmission or the lowering of the parasite reservoir can be more quickly or more effectively produced by adding another means of attack, such an addition may be indicated. Wherever an alternative measure is cheaper, it might well be substituted.

Prevention of anopheline breeding or destruction of the anophelines in the aquatic stage may, under certain circumstances, be recommended either as an adjuvant to house-spraying or as a substitute. Any attempt to prevent anophelines breeding in natural waters must be based on accurate knowledge of the identity of vector species and their habits. In the region of the Mekong River Basin a good deal is known in this respect. The principal vector, A. minimus, normally prefers cool water with marginal vegetation, such as is found in summer in open sunlit streams and seepages. The clearing of forests in this area has almost always produced breeding places for this vector, consequently the better developed regions were frequently very malarious. Although keeping sides and bottom of water courses clear of vegetation and obstructions has been somewhat successful, the prevention of breeding was never completely successful in this area, whereas residual spraying with DDT has often succeeded in virtually eliminating this vector.

The special circumstances in which prevention of vector mosquito breeding is indicated through permanent works of water removal or shore line development, or through periodic destruction of larvae by naturalistic or chemical means, are in areas of high population concentration, at sea ports and airports and, in some instances, as an adjuvant to house-spraying. In many cities located in malarious areas it is easier and cheaper to carry out larval control than to spray all the houses. At important points of arrival of possible infected human carriers or stowaway mosquitos, it is extremely important to avoid both the existence of local vectors and potential breeding places for imported vectors if malaria has been eradicated from the area.

The justification of larval control as an adjuvant to residual spraying of houses requires a careful study of the dynamics of malaria transmission in the area. It is advocated that, other factors being equal, water impoundment or irrigation schemes be located and designed so as to avoid increasing the anopheline potential. Where such considerations involve a substantial increase in cost, however, their inclusion in the plan would have to be justified either by some weakness in the residual spraying scheme or by the need to maintain freedom from anophelines at a later stage after residual spraying had been withdrawn. This point might be an important one in a river basin development scheme where the construction work or the subsequent influx of population are scheduled to take place after the eradication of malaria in that area.

The preceding paragraphs are intended to suggest the advisability of careful planning at an early stage of new river development in a malarious or recently malarious area. It is impossible to lay down in advance general rules about the advisability, from the point of view of preventing malaria, of including mosquito prevention measures in the design of such works. The choice of a course of action, which may have important economic and public health implications, must be based on competent entomological and engineering studies and a careful evaluation of the situation in the light of the malaria eradication activities under way in the area.

The purpose of this note is to draw the attention of engineers and planners to the fact that there are substantial health problems related to the construction of dams and other hydraulic works. Each project presents its own problems of ecology and disease patterns, and broad generalizations can be a little dangerous. The engineer or planner, however, can turn to the epidemiologist, the medical biologist and the public health engineer for skilled advice and assistance, and through them can tap the resources of the public health profession. A notable example of this is provided in the early planning for the Volta River project in Ghana, where a team of public health specialists made a survey of the area and evaluated the health problems as one of the earliest steps in planning. Such a reconnaissance is not costly, but it may in the long run be of very great value."

4. JAMAICA - MALARIA ERADICATION TRAINING CENTRE

The United States International Co-operation Administration, in their Health Summary for the first quarter of 1961, report on the work of the Malaria Eradication Training Centre in Jamaica; from this report the following summary has been made:

The Malaria Eradication Training Centre in Kingston, jointly sponsored by the Government of Jamaica, the Pan American Health Organization (World Health Organization) and the International Co-operation Administration, has been in operation since April of 1958.

The headquarters for the Centre are associated with the Jamaican Ministry of Health offices. A class-room laboratory and offices are located in the West Indies School of Public Health, which is in the Ministry compound. A spraying laboratory, shop and garages, to house the Centre's vehicles, are nearby.

Instruction is carried out by a resident staff and by visiting teachers. The resident staff consists of a director-malariologist, a sanitarian, an administrative officer and a part-time consultant in public health education supplied by WHO/PAHO; and an associate director-entomologist, a sanitary engineer and a sanitarian supplied by ICA. Operational expenses are shared by WHO/PAHO and ICA. Students are sponsored by WHO/PAHO and ICA. Visiting lecturers and teachers from WHO, ICA, PAHO, the United States Public Health Service and from Mexico, British Guiana and Venezuela handle specialized subjects such as epidemiology, administration, statistics, the use of drugs and microscopic diagnosis.

Two types of courses are offered at the Centre - junior courses of eight weeks' duration and senior courses of 11 or 12 weeks' duration. A total of four junior courses and ten senior courses have been held. The main objective in all courses is to provide intensive instruction in malaria eradication techniques for those who will have positions of responsibility in the various programmes of the world.

A summary of the professional classifications of students who have trained at the Centre is as follows:

Physicians	71
Sanitarians	58
Entomologists	41
Engineers	28
Health Controllers	18
Others (Health Educators, parasitologists etc.)	15
Total	231

From the beginning of the work at the Centre participation has been strongly international. To date, 49 countries have been represented by the students. These countries are as follows:

Algeria, Belgium, Bolivia, Brazil, British Honduras, Burma, Chile, China, Dominica, Ethiopia, France, Germany, Ghana, Greece, Haiti, Holland, India, Indonesia, Iran, Iraq, Italy, Jamaica, Japan, Korea, Laos, Liberia, Morocco, Nepal, Nicaragua, Nigeria, Northern Rhodesia, Norway, Pakistan, Peru, Philippines, Puerto Rico, Saudi Arabia, Somalia, Southern Rhodesia, Switzerland, Sudan, Surinam, Thailand, Turkey, United Arab Republic (Egypt), Uganda, United Kingdom, United States of America, Viet Nam.

Because of the broad international basis on which the Centre has developed it has made a strong contribution to the development of uniform practices in malaria eradication the world over. The technical reports and documents issued by WHO provide the broad guide lines to the practices and procedures which are taught.

Every attempt is made by the METC staff to revise the curriculum as indicated by current developments in malaria work in order that the Centre can continue to serve in turning out effective leaders in this world-wide eradication effort.

5. THE USE OF ANTIMALARIAL DRUGS 1959/1960

In the course of an investigation into the world needs of antimalarial drugs, the quantities supplied by the United Nations Children's Fund and the World Health Organization during the years 1959 and 1960 were obtained from Regional Offices.

In the table appended it should be noted that in the American Region very large issues were made in 1958 and consequently the issues in 1959 were reduced.

In the African Region the figures for the UNICEF supplies could not be separated for 1959 and 1960 and these have had to be averaged.

The table shows the total quantities of base supplied and includes both tablets and powder.

Drug	Quantity supplied 1959 kg	Quantity supplied 1960 kg	Increase or Decrease
Amodiaquine	50.0	85.8	+ 35.8
Chloroquine	4 034.05	4 740.15	+ 706.10
Primaquine	26.38	20.73	- 5.65
Pyrimethamine	292.33	456.21	+ 163.88

6. FIFTH MOSQUITO'S SONG

(The anopheles is now defying the standard spray, a traveller alleges)

O the bright blood of Mrs Ripley-Lawson
Brigadier ffoulkes and Major "Tiny" Bellows!
Nightly I sipped it, zooming through the curtains,
Humming a rondo.

Clarity, bouquet - that is what I went for;
Vintage, non-vintage, military or civil -
You should have seen those rows of regal snozzles
Blushing at sunrise.

O the wild night when all the sleeping Pharaohs
Stirred in their tombs to hear the noise at Luxor;
Ten picked commandos and one main objective -
Lowells or Cabots.

Now I am old, a very old mosquito,
Boring ten million offspring with my stories,
Forays, escapes, late slaps and futile sprayings,
Nosedives and sideslips.

Once in my youth I heard with dumb amazement
Tales of a lyrical Italian forbear
Gifted with song - a present from the Brownings,
Mr and Mrs . . .

Pooh! I am silent. What are feats of this kind?
More dazzling targets lure a new proboscis;
Biting the haughty snout of Mother Science?
Rascals, I hail ye!

- D. B. Wyndham Lewis*

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