

MALARIA – THE END OF A CYCLE? FURTHER CLINICAL AND LABORATORY
EXPERIENCES OF MALARIA IN SEREMBAN – DURING THE FOUR YEARS 1970–73.

By

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Introduction:

This is a further, short, factual report of the author's experiences of malaria in a medical practice in the town of Seremban in the State of Negeri Sembilan, Peninsular Malaysia. This report covers the four years period which commenced on 1st January, 1970 and concluded on 31st December, 1973. The years 1970 – 1971 have already been reported elsewhere, O Holohan and Matthews (1972), but are included in order to give a broader perspective and again the figures for the first report have been modified by applying stricter criteria for malaria episodes rather than episodes of parasitaemia. Finally a special study of children aged 2 years and under has been made over the whole four year period.

As in our previous report we are only concerned here with parasitologically proven malaria in patients attending the writer's clinic or discovered on domiciliary visits. Malaria episodes occurring on Rubber and Oil Palm Estates (total population over 20,000 persons) visited by the authors are not included in this report.

The objects of the report are to put on record the number of parasitologically proven cases of malaria in a particular busy practice, in a particular locality over a given period. The practice has not changed in character, either in the number of patients seen year by year or in the ethnic, social, regional, distribution of the patients who attend it. It is

therefore suggested that any changes (in malaria pattern) which have or have not occurred over this four years period can reasonably be assumed to reflect similar changes in similar practices in the immediate neighbourhood.

This is not the report of a widescale survey of a chosen area nor is it a study of a stable population such as is found on a rubber plantation, farming community or a group of kampungs. In such cases the investigators go to the subjects and study them in their own environment – the area where their infection is most likely being obtained and transmitted. Our role is more that of an observation post waiting for the subjects to come our way if, when and as often as they themselves chose to do so. Our subjects will of necessity be a group with diverse backgrounds. Some will have come direct to us either as old patients (who return) or completely new patients who may have been to other practitioners, hospitals or district health centres. Some of the latter group may have already had some antimalarial therapy either after blood examination or on clinical grounds.

Our study therefore has its limitations on purely epidemiological grounds but if our opening remarks on the objects of our report are borne in mind it is believed that this study will stimulate medical practitioners to be more malaria conscious and make more frequent use of the microscope in the diagnosis of febrile illness.

The work of Huehne et al. (1967) emphasises that as most malarial statistics in West Malaysia are derived from hospitals and estates reports (and certain controlled study schemes) the overall incidence of malaria in the true rural areas are grossly underestimated. The findings of Toh and Yeo (1971) in Singapore, which at the time was believed by many to be malaria free, that only 48% of their subjects had been clinically suspected of malaria and in 24% the disease was not even considered a possibility and was only discovered during routine haematological investigations prompted these authors to suggest – “that the degree of diagnostic accuracy can be greatly enhanced through increased awareness of its presence here.”

The timing of this report is opportune as it coincides with the start of Phase One of the Malaria Eradication Programme in the State of Negeri Sembilan.

Materials and Methods:

All patients attending the clinic (including patients attended on domiciliary visits) were closely questioned to elicit a history suggestive of malarial infection and blood slides taken for examination in suspected cases. During the height of the maximum malaria transmission season, all patients who were willing to co-operate had blood examination. From mid-April to mid-July, relatives who accompanied patients were also examined where possible. In cases where the physician felt that malaria was clinically the most likely diagnosis, the blood tests were repeated if initially negative.

Thick films, using Field's quick staining method was the standard procedure – when pressure of work was less heavy, thin films were also examined. Where a second examination was called for to establish the diagnosis both thick and thin films were employed and 200 microscopic fields examined in each.

TABLE I
BLOOD EXAMINATIONS 1970 – 1973

No. of Slides Examined:	27,537
No. of Episodes of Malaria:	6,049 in 5,297 Individuals.
Males:	3251 53.7%
Females:	2798 46.3%

In this report (over the 48 months period commencing 1st January, 1970 and ending 31st December, 1973) we have attempted to be more specific as to the number of episodes. We do not include episodes of malaria parasitaemia in the follow-up period after treatment. Any episodes of parasitaemia of the same species occurring within sixty days is counted as one and the same episode of malaria. Some fresh infection after successful treatment may thus not be counted but it reduces the inclusion of recrudescences (especially *P. vivax*) as separate episodes of malaria. Many of the total number of examinations were repeated tests before the parasite was discovered and also many were follow-up tests after treatment.

TABLE II
INCIDENCE IN ETHNIC GROUP – 4 YEARS

		%
Malay	2780	46.0
Indian	1708	28.2
Chinese	1420	23.5
Others	141	2.3
Total	6049	

As can be seen in Table II, the greatest incidence was among Malay patients – all but a very few of whom came from the rural areas, i.e. kampungs and land development schemes. While some of the Indians came from the town areas, the majority came from rubber or oil palm estates. Many of the Chinese came from Seremban town and its environs, others from rubber estates, small villages or even logging camps in the rural area. When it is appreciated that Indians and others form only 15% of those attending the practice (a constant percentage year by year) the incidence in this community is therefore high. The overall incidence over the four years reflects the yearly incidence very closely.

TABLE III
AGE DISTRIBUTION 1970 – 1973

			%
Children:	2 years and Under	671	11.0
	3 to 5 years	481	8.0
	6 to 12 years	766	12.7
	>12 and Adults	4131	68.3
		6049	=====

While we have only divided our subjects into two age groups, i.e. under 12 years, and over 12 years, we found, as others have, that malaria has a predilection for the young and most of our cases were under 35 years of age.

Our youngest patient was 18 days old – our oldest was 80 years. We had an average of about 10 cases of cerebral malaria per year in children under 12 years – ranging from behaviour disorder (aggression, hostility, mutism and altered mood) to stupor and semi-coma. Hyperpyrexia (highest record temperature 108°F.) was a not infrequent problem and required immediate and persistent therapeutic efforts to lower the temperature as hyperpyrexia itself can be lethal to young children and infants. We have learned to keep patients with us for at least two hours after successfully lowering the hyperpyrexia as a sudden resurgence of pyrexia is not uncommon within half to one hour.

TABLE IV
ALLOCATION OF CASES ACCORDING TO AREA

	1970	1971	1972	1973
	%	%	%	%
Negeri Sembilan Total:	1434	1553	1447	1163
N.S. Outside Seremban:)	761	963	1027	923
Seremban Town Board:)	673	590	420	240
Selangor:	68	107	61	48
Other States:	70	52	24	22
Total: >	1572	1712	1532	1233

It can be seen here that there are some differences in the 1970 – 1971 figures from our previous report. This is due (see above) to a more ruthless elimination of possible recrudescences of malaria and including some previous 'cases' as single 'episodes'. Most cases naturally come from Negeri Sembilan. As the rate in the Seremban Town Board area fell the rest of Negeri Sembilan showed a proportionately higher malaria rate. However this higher level in the rural area was more apparent than real – there was in fact little change over the years in the rural rate. Selangor is mentioned specifically as we share a long common border (ranging 16 – 20 miles from Seremban Town) and most of the "other States" were in fact cases from the timber areas of Pahang who came to us through Kuala Pilah.

FIGURE 1
ALL MALARIA EPISODES IN N.S.
&
SEREMBAN TOWN BOARD AREA

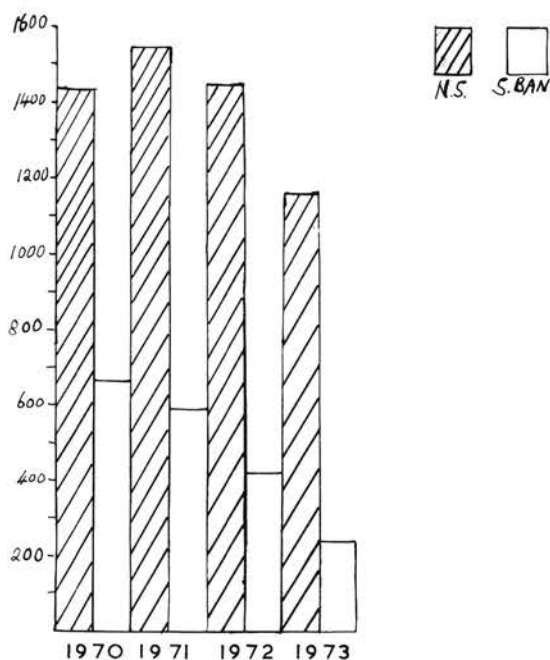
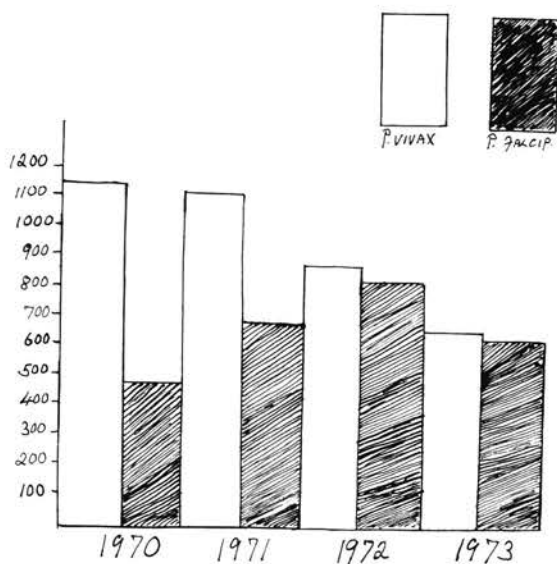


Figure 1 shows the Negeri Sembilan picture (over 90% of all our malaria cases) quite clearly. There is little significant difference in malaria incidence over the four years outside of Seremban Town Board area. The Town Board area shows a steady fall year by year — most marked after 1972.

FIGURE 2
YEARLY VIVAX & FALCIP.



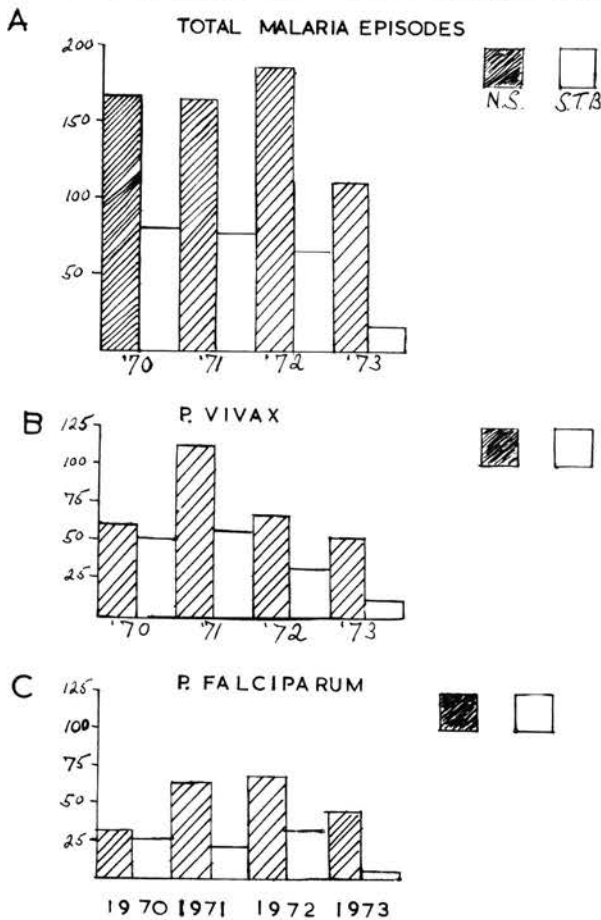
There is little significant difference between the overall malaria in 1970 and that of 1973. However it does appear that falciparum is certainly not on the wane. This may be due to an increase in Chloroquine resistant falciparum - many of whom end up at our clinic because of our known interest in malaria. As we have tried to exclude recrudescences in this series this may reduce our figures for vivax (but the same criteria were applied to the earlier years also) but some of the apparent drop in P. vivax cases could be due to a greater awareness of malaria and thus such cases are now vigorously treated on clinical grounds in this area without resort to the microscope.

TABLE V
STUDY OF CHILDREN AGED 2 YEARS AND UNDER

In	there were	172 Episodes in	110 Children	11.0 of all malaria
1970	"	"	"	"
"	"	179	165	10.5
"	"	202	182	13.2
1973	"	118	99	9.6
Total:	671	556	110	11.1

Table V shows the absolute figures from all areas year by year. There is a definite drop in 1973. This age group we studied in some detail as they are too young to be (very) chronic in regards to P. vivax and they certainly act as pointers to fresh transmission each year, especially of P. falciparum.

FIGURE 3
CHILDREN 2 YR ... N.S. & SEREMBAN



In this age group Figure III (A) it can be seen that there was little overall change both in the whole State of Negeri Sembilan and in the Seremban Town Board area up to the end of 1972. The overall incidence was less for the State in 1973 but the Town Board area showed a dramatic and significant drop in the same year.

Figure III (B & C) show that again throughout the four years the incidence of both vivax and falciparum did not significantly change in this age group except in the Seremban Town Board area where there were only 6 episodes of falciparum malaria in 1973.

These graphs suggest that fresh malaria transmission was taking place at about the same rate throughout the State year by year but that in the Seremban Town Board area a change had taken place and transmission was brought to a very low level in 1973. This was due to vigorous anti-malarial measures undertaken by the Seremban Town Board Health Officers.

Some Notes on the Clinical Presentation:

In our previous report on this subject (ibid) we dealt in some detail with our clinical experiences and will not repeat them here. However, in a recent study (O'Holohan 1974) based on these experiences some interesting facts emerged on studying 1000 subjects in close detail.

In a close examination of 1334 episodes of malaria in 1000 subjects it was found that at the time the parasite was discovered 49% of the patients were afebrile i.e. had a temperature of 99°F. or less. (This did not preclude pyrexia either before or after the discovery of the parasite.) This is mentioned as many clinicians appear to wait for a rise in temperature before taking blood for examination.

Toh and Yeo (1971) found that presenting symptoms (in 87 subjects) in decreasing order of frequency were fever, chills, rigors, headaches and sweats. These were followed by vomiting, the passing of dark urine and non specific complaints like bodyache and gastroenteric disturbances.

We studied 200 episodes of malaria (100 *P. vivax*, 100 *P. falciparum*) to establish what the presenting complaint (i.e. the symptoms which prompted the patients to seek medical attention) was and found the following (Table VI).

TABLE VI
presenting symptoms in 200 CASES OF MALARIA

	P. vivax (100)	P. falciparum (100)
Classical (i.e. chills, fever, sweats – all 3)	6%	17%
Fever & Chills	46	52
Fever only	23	10
Fever & Sweats	1	2
Fever with Diarrhoea/Vomiting	4	4
Cough	11	5
Body pains	7	4
Abdominal pain	–	3
Chills only	2	–
Sore throat	–	2
Cerebral	–	1
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	100%	100%
	=====	=====

In the matter of chemotherapy a recurrent problem was that of inadequate Chloroquine therapy. It has been established that the loading dose of Chloroquine is most important (Covell et al. 1955). Many practitioners appear to fear the unpleasant side effects of Chloroquine (such as nausea and vomiting) and attempt to minimize these side effects by giving smaller doses over a longer period. The 4 – Aminoquinolines are rapid blood schizonticides but they must be given in adequate dosage and the initial loading dose is all important. In our experience the side effects are not always dose related and even inadequate doses can cause severe vomiting and depression with a continuing parasitaemia. It was a not uncommon experience to be presented with patients who had patent asexual parasitaemia including (*P. vivax*), evidence of Chloroquine in the urine and severe vomiting who required parenteral therapy. Many such patients appear to show increased sensitivity to the phenothiazine derivatives used to control vomiting and present a therapeutic problem. 50 mg. of Promethazine Hydrochloride by intramuscular injection to patients above the age of 12 years (and proportionally less for younger age group) was found to be most effective.

Conclusion:

If our practice can be accepted as reasonably representative of similar such practices in the area of

Seremban (always bearing in mind that patients from all over the State tend to seek medical attention in the State Capital) then the pattern of malaria as portrayed here should give some idea of the overall picture throughout the State. We have here no recorded data prior to 1970 (clinical impressions are unreliable) but the picture we have displayed could suggest that there has been a persistent level of malaria for some years. Month to month figures are so dependent on local climatic conditions that they are unreliable and tend to give rise to later clinical impressions that there were periods of intense malaria acting alternating with little or no malaria. The overall figures show that there has been in fact no epidemic – rather a state of endemic malaria.

The figures for the two years old age group show that fresh transmission has been taking place throughout but that there has been dramatic curtailment of such transmission in the Seremban Town Board area. The figures for the Negeri Sembilan rural areas suggest that this change in the Seremban Town Board area was not part of a general decline in malaria but the result of interference in transmission.

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