CASES OF MALARIA NOTIFIED IN NSW IN 1990

Although malaria transmission has not been reported in NSW since World War II (except for induced cases used in the treatment of neurosyphilis), the disease is regularly imported by people arriving from malarious countries. Data on malaria cases in NSW and the ACT are collated by the Department of Parasitology, Centre for Infectious Diseases and Microbiology, Westmead Hospital. This information is valuable for those providing advice to travellers and is also included in the Australian Malaria Register, maintained by the Tropical Health Program, University of Queensland. The data are conveyed to the World Health Organisation as part of the statutory requirements for the continuation of Australia's standing as a malaria-free country.

Individual case details are obtained following confirmation of the original species diagnosis by the parasitology reference laboratory at Westmead Hospital. The confirmation of diagnosis is necessary because about 20 per cent of all original identifications are incorrect. It is hard to judge what proportion of cases is included but, as one of the largest hospitals in Sydney does not send slides for confirmation, it is clear that many cases are missed each year. Also missed are cases diagnosed by pathology laboratories operating in the north of the State which have their main laboratory in Brisbane.

With malaria to be included among the infections notifiable by laboratories, the proportion of diagnosed cases which will be included in the State register should rise. If all laboratories making malaria diagnoses were to send slides for confirmation, apart from an improvement in the reliability of the data in the register, the error rate should fall as more join the quality assurance program provided.

Overall there were 201 cases notified to the State register in 1990 but for four of those no blood slide was provided, so confirmation of the diagnosis was not possible. For the other cases the breakdown of species is shown in Table 3.

TABLE 3

SPECIES OF MALARIA DIAGNOSED IN NSW IN 1990

Species	Frequency	Percentage of total
Plasmodium vivax	142	72.1
Plasmodium falciparum	47	23.9
Plasmodium malariae	5	2.5
Plasmodium ovale	3	1.5
TOTAL	197	

This total is 54 more than for 1989 but the proportion of species is about the same for both years. There has been a steady increase in the proportion of *Plasmodium falciparum* infections since 1975, when they constituted 12 per cent of cases in this State. This rise has coincided with the spread of chloroquine-resistant *P. falciparum* and, more recently, with an increase in the number of Australians travelling to African countries, where *P. falciparum* predominates.

LAG IN DIAGNOSIS

On average there was a lag of 6.3 days between the onset of symptoms and the diagnosis of infection for *P. falciparum* and 7.7 days for *P. vivax*. Fourteen per cent of all infections were diagnosed on the day of onset. By three days 57 per cent of all *P. falciparum* and 49 per cent of *P. vivax* infections were diagnosed. The longest lag period was 76 days for a case of *P. vivax*.

Contrary to reports from other parts of Australia, particularly Queensland, Table 4 shows there is no clear-cut pattern of seasonality in the diagnosis of malaria in NSW.

TABLE 4

MONTH OF DIAGNOSIS

Month	P. vivax	P. falciparum	P. ovale	P. malariae	Total
Jan	11	4	0	0	15
Feb	13	8	1	0	22
Mar	12	7	0	1	20
Apr	8	3	1	2	14
May	12	5	0	0	17
Jun	12	4	0	0	16
Jul	11	5	2	0	18
Aug	9	2	1	0	12
Sep	9	3	0	0	12
Oct	18	5	0	0	23
Nov	10	0	0	0	10
Dec	14	1	0	0	15
TOTAL	139	47	5	3	194

GEOGRAPHICAL ORIGIN WITHIN NSW

The cases were widely distributed throughout NSW and the ACT, but the majority occurred in several health regions: 48 (24.2 per cent) in the Northern Sydney Region, 30 (15.2 per cent) in the Eastern Sydney Region, 26 (13.1 per cent) in the ACT, with the great majority of the rest being diagnosed in other regions in Sydney.

REASON FOR EXPOSURE

Eighty individuals (45 per cent) were exposed to infection while on holiday. Thirty-four (19 per cent) were residents of malarious countries visiting Australia and 12 (7 per cent)

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Cases of malaria in NSW in 1990

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were immigrants or refugees from such countries. Thirty (17 per cent) were infected while living in malarious countries for purposes of employment and 16 (9 per cent) while visiting on business. Two became infected while on military exercises.

CLASSIFICATION OF CASES

One hundred and ninety cases were imported into Australia and none was a relapse from previously imported infections. One of the relapses was the second suffered by the individual concerned.

TABLE 5

GEOGRAPHIC ORIGIN OF CASES

Region of origin	Number of cases	Percentage
Africa	18	9.4
Central America	1	0.5
South America	1	0.5
Southern Asia	26	13.6
South East Asia	44	23.0
South West Pacific	100	52.4
TOTAL	190	

The geographic regions of origin of the diagnosed cases of malaria are listed in Table 5. In keeping with past years the great majority of cases come from the countries of the South-West Pacific Region, Papua New Guinea (75), the Solomon Islands (13) and Vanuatu (11). One individual infected in the region had visited all three countries, so an exact country of origin was not determined. In this region 71 per cent of cases were *Plasmodium vivax* and 27 per cent *P. falciparum*.

Of the 44 cases imported from South East Asia, 31 were from Indonesia. Many of these are reported to have been acquired in Bali, but it is difficult to be sure the person has not also travelled to Lombok or some other part of the country. *Plasmodium vivax* infections totalled 75.6 per cent of infections from this region and *P. falciparum* 22 per cent.

All the cases imported from Southern Asia were *Plasmodium vivax*. Twenty-three (88.5 per cent) were from India, two from Pakistan and one from Sri Lanka.

Plasmodium falciparum (12 cases, 66.7 per cent) predominates in cases from African countries. There were equal numbers (three each) of *P. ovale* and *P. vivax* from this region.

ACCURACY OF DIAGNOSIS

For 151 (76.6 per cent) of the 197 blood slides submitted the original diagnosis was correct. With the other 46 (23.4 per cent) cases, the type of error varied. In 19 instances the diagnosis given was 'malaria'. Although that was basically true, because the proper clinical management of malaria depends on knowledge of the species involved, this diagnosis was classed as incorrect. There are some laboratories which seem to wait for the confirmed diagnosis from the reference laboratory before reporting to the referring doctor. This is a dangerous practice where *P. falciparum* is involved and in one instance recently, was partly responsible for a near fatality. If the 'malaria' category is not included in the calculations there is still an error rate in diagnosis of 14 per cent overall and of 16 per cent in cases involving *Plasmodium falciparum*. This is much higher than it was about 10 years ago and is cause for concern.

TABLE 6

AGE AND SEX OF CASES

Age group	Females	Males	Total
0-4	2	2	4
5-9	1	7	8
10-14	3	6	9
15-19	1	7	8
20-24	11	27	38
25-29	13	22	35
30-34	8	17	25
35-39	3	17	20
40-44	4	9	13
45-49	1	6	7
50-54	3	5	8
55-59	1	3	4
60-64	2	2	4
65-69	5	1	6
70-74	1	1	2
75-79	1	0	1
80-84	1	0	1
TOTAL	61	132	193

Details of the age and sex of 193 individuals were available and are shown in Table 6. The youngest person infected was a 1-year-old male who was a resident of Papua New Guinea and the oldest an 84-year-old woman who had recently emigrated from Vietnam. Both were infected with *P. vivax*. The 1-year-old also had *P. falciparum* diagnosed several months previously in Brisbane. The mean age for females was 35 years and the mean for males was 30 years.

PROPHYLAXIS

Because of the increasing problem of drug resistance it is becoming more difficult to give advice on malarial prophylaxis. The information available in this instance cannot help with making decisions about the efficacy of particular prophylactic regimens, because there is no information on how many individuals overall were using a particular drug or drugs. It is important for those advising travellers to stress that malaria prophylaxis will not prevent infection; it should prevent illness while the drug is still being taken but, with drug-resistant strains, even that can not be guaranteed.

Among those in whom malaria was diagnosed the most frequently used single drug was chloroquine (34 individuals) and the most common combination chloroquine and maloprim (39 individuals). Sixty people were taking no prophylaxis. There were significant national differences in the patterns of use of prophylaxis — 18.6 per cent of Australians, 66.7 per cent of Papua New Guineans and 91.7 per cent of Indians were not using any anti-malarial drugs.

In Papua New Guinea 70-80 per cent of all malaria cases (depending on the region) are caused by *P. falciparum*. The proportion of infections caused by that species in indviduals infected in PNG who were taking prophylaxis of some form was 20 per cent, but in those who were not taking prophylaxis the proportion was 48 per cent. Thus, there can be no doubt that some form of malaria prophylaxis is of value in preventing a proportion of *P. falciparum* infections which would otherwise occur.

John Walker
Department of Parasitology, Centre for Infectious Diseases and Microbiology, Westmead Hospital