

MAIN BREEDING SITES AND METHODS OF AEDES AEGYPTI CONTROL IN VIENTIANE, LAO PDR

by

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INTRODUCTION

Aedes aegypti is considered the main vector of dengue haemorrhagic fever in Vientiane, the Capital of Lao PDR. The survey of this mosquito first started in May 1985 in Vientiane, after the Workshop of *Aedes aegypti* and its Importance in Public Health, conducted by Dr Lee S. Self, Regional Adviser on Vector Control, from 11 to 22 February 1985.

Referring to the results of the *Aedes* larvae surveys from the previous years, their breeding sites could be classified into three main categories:

- Main breeding sites : Drums (200 litres), jars, and cement water tanks.
- Breeding sites inside houses: ant guards and flower vases.
- Old tyres, broken jars, coconut shells and other types of containers exposed to rain.

Therefore, the control of *Aedes aegypti* in Vientiane focused on these three main categories of breeding sites.

RESULTS OF THE SURVEY

The survey showed that *Aedes aegypti* was widespread in Vientiane, particularly in the four urban districts of Vientiane (Table 1). In order to monitor its abundance and presence permanently, the following indices are taken for interpretation of the results.

- Breteau index > 50 : High risk of transmission
 < 5 : Low risk of transmission
- House index > 10 per cent: high risk of transmission
 < 1 per cent: low risk of transmission

TABLE 1. Breteau index (BI) and house index (HI) in four urban districts of Vientiane (1987-1990)

District/Year/ Indices	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Chanthabury												
1987 BI	37	70	113	63	106	46	23	22	44	48	25	40
HI	23	36	66	36	63	36	16	17	32	44	20	35
1988 BI	20	12	32	40	40	24	24	16	7	12	...	...
HI	20	8	28	28	32	20	24	12	6	16	...	...
1989 BI	19	15	4	16	8	5	7	4	12	15	...	...
HI	7	10	3	10	7	11	6	3	11	10	...	...
1990 BI	10	18	12	23	37	20	10	9	32	...	...	...
HI	8	5	12	14	21	14	8	10	11	...	...	...
Sikhottabong												
1987 BI	60	50	56	90	130	46	46	20	8	8	20	35
HI	39	36	43	44	80	40	34	20	8	16	15	40
1988 BI	36	25	40	25	25	24	16	20	35	12	...	...
HI	24	25	32	20	22	21	16	12	35	16	...	...
1989 BI	55	34	6	9	9	10	6	5	6	9	...	...
HI	23	19	5	5	6	12	8	4	5	7	...	...
1990 BI	9	16	10	6	7	10	12	16	17	...	...	...
HI	6	7	9	6	10	10	12	11	12	...	...	...
Kaysettha												
1987 BI	53	20	47	60	50	80	2	0	12	13	4	44
HI	46	16	36	47	30	64	2	0	8	12	8	23
1988 BI	35	35	40	24	20	44	36	8	20	16	...	...
HI	30	25	36	24	12	40	28	8	20	24	...	...
1989 BI	17	18	26	6	7	4	11	12	29	21	...	...
HI	13	12	15	6	7	6	9	8	21	14	...	...
1990 BI	13	11	9	11	10	35	12	10	10	...	...	...
HI	11	14	8	8	9	23	14	8	7	...	...	...
Sisattanak												
1987 BI	88	76	77	56	60	100	0	0	80	65	30	23
HI	46	46	53	56	40	53	0	0	36	50	20	20
1988 BI	16	39	20	24	32	103	45	48	7	4	...	...
HI	12	32	20	24	24	60	30	36	6	4	...	...
1989 BI	24	9	8	12	5	1	2	1	2	6	...	...
HI	17	7	8	6	2	2	3	4	2	6	...	...
1990 BI	4	5	6	6	7	5	5	10	7	...	...	...
HI	3	10	4	6	6	3	6	6	4	...	...	...

... = Data not available

Interpretation and Discussion

- In 1987, from January to June, the Breteau index and house index were very high. The epidemic began in June. Before the epidemic the number of Aedes had increased.
- In 1988, 1989 and 1990, Breteau index began to decrease, but the house index was still more than 10 per cent.
- Taking the Breteau index and house index together, it can be concluded that Aedes aegypti still occurs in Vientiane, but with low numbers.

METHOD OF CONTROL OF Aedes Aegypti

Different methods were used to control Aedes aegypti in Vientiane in order to bring down the density of Aedes aegypti to a level that would not permit epidemic to occur.

Each year, the activities start in January and go up to the end of the year, with the participation of the community, school children, teachers, mass organizations and with the use of larvicide such as Temephos SG 1 per cent.

Temephos (Abate) 1 per cent SG were introduced for the first time as a complementary measure to control Aedes larva during the outbreak of DHF in 1987. Table 2 shows the number of houses and villages where water containers were found to be positive for Aedes larva and unable to change the water routinely, that were treated with temephos.

TABLE 2. Villages and houses treated with Temephos, 1987-1990

Year	No. of villages treated	No. of houses treated
1987	19	117
1988	26	331
1989	113	2 432
1990	68	1 148

However, the most important activity was the promotion of community involvement in vector control in their own premises. Table 3 shows that the number of houses surveyed for the investigation and control of Aedes larvae increased with the participation of community health workers and school children.

Another method of Aedes aegypti control is the use of regulations to change the behaviour of the population to keep their water containers free of Aedes larvae. Table 4 shows the number of advices, and summonses given to households that were found to have Aedes larvae in their containers

after having informed twice. The rates of summons is : 300 Kip for the first time 600 Kip for the second time, and 1 000 Kip for the third time.

TABLE 3. Houses surveyed and school children who participated in the survey

Year	No. of houses surveyed	No. of school children who participated
1987	23 970	450
1988	26 400	670
1989	75 927	1 908
1990		720

TABLE 4. Advice and summonses issued to householders, 1987-1990

Year	No. of summonses	No. of advices
1987	0	0
1988	234	2 529
1989	430	9 013
1990	374	7 560

As regards biological control, not much activity has been undertaken. As such, it is difficult to convince people to put larvivorous fish in their water containers. However, there is great potential for the use of copepods in controlling Aedes aegypti.

ISSUES AND PROBLEMS

In practice, even with a Breteau index of less than 50, there were cases of DHF, indicating the need to look at the types of containers. The number of Aedes larvae varied depending on the size of the container.

A Breteau index of less than 50 for flower vases and ant guards is different from a Breteau index of less than 50 for drums of 200 litres, jars and cement water tanks. Therefore, it is essential to focus the investigation on the type of container.

The epidemic cycle of dengue haemorrhagic fever is also an important point for discussion. The beliefs relating to this epidemic in Laos (two-year cycle) are very dangerous because with four types of dengue virus and a high volume of Aedes aegypti, DHF can spread any time.