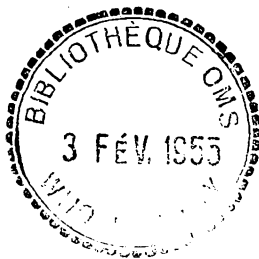


WORLD HEALTH  
ORGANIZATIONMALARIA CONFERENCE FOR THE WESTERN  
PACIFIC AND SOUTH-EAST ASIA REGIONS15-27 November 1954

a 50621

ORGANISATION MONDIALE  
DE LA SANTÉWHO/Mal/120 ✓  
Baguio Conf./19  
1 December 1954

ORIGINAL: ENGLISH

The Chief of the Malaria Section  
has the honour to communicate hereunder  
the following note:

THE PILOT PROJECT OF RESIDUAL SPRAYING IN  
NETHERLANDS NEW GUINEA

by

Dr. Dirk METSELAAR  
Head, Malaria Service  
Netherlands New Guinea

The Pilot Project consists of two parts:

1. An experiment with experimental houses started by Professor Dr. P.H. van Thiel of the Leiden University.
2. A field experiment.

## 1. EXPERIMENTAL HOUSES

Observations on the bionomics of the anopheles punctulatus group and A. karwari in experimental houses as well as observations during a period of six weeks after spraying with DDT of one house and dieldrin of a second one have already been published in the Bulletin of the World Health Organization by van Thiel and Metselaar. The period of observations was 30 weeks when the experiment had to be discontinued because the number of mosquitos was too small by an abnormal draught. Figures are reproduced in Table I in which the 30 weeks are divided in five periods of six weeks.

Conclusions

The figures, especially those of the later periods are small and do not allow definite conclusions. We can only state that:

1. Anophelines of the punctulatus group and A. karwari are most probably highly susceptible to chlorinated insecticides.
2. The figures of the dieldrin house do not show the usual tendency that the residual action of dieldrin persists longer than that of DDT. This is true even when we take into consideration that the high survival percentage in the period of the 19th-24th week is probably caused by an abnormal factor such as a smoky lamp.
3. When the numbers of mosquitos will permit to do so, it seems useful to extend the period of observations till the end of one year.

## 2. FIELD EXPERIMENT

The experiment is carried out in:

- (a) the experimental area in the proper sense, where the complete population has its own registration card;
- (b) a surrounding area;
- (c) a comparison area.

(a) The experimental area has a population of about 5,000 people, living in two malariological different zones, a meso-endemic and a hyperendemic zone. In October - December 1954 a malaria survey was performed in that area, with results as shown in Tables II and III.

Between January - March 1954 the experimental area was sprayed for the first time with DDT wettable powder at a rate of 2 grams per square metre (200 mg per square foot). Second treatment six months later.

(b) The surrounding area was sprayed at the same time. It was included to prevent as much as possible the possibility of infection outside the treated area. In some villages in this area a spleen and parasite survey was done, which revealed that hyperendemic malaria existed in the area. No registration of the population took place.

(c) The comparison area is situated in a valley next to the valley of the experimental area. About 3,000 inhabitants. In February 1954 a sample of about 1,000 people was taken for a spleen and parasite survey, with results as shown in Table IV.

From the various figures it will be clear that, though the comparison area and part of the experimental area are both hyperendemic, the endemicity of the comparison area is of somewhat higher value.

### Observation of Results

#### (1) Examination of infants.

On the day of the first spraying or shortly after, the infants of the experimental area were examined once more with results as shown in Table V.

It will be seen that only after the seventh month of life a high infection rate is reached among the infants of the hyperendemic zone of the experimental area.

After spraying, the new-born babies in the experimental area were examined every month. In September one child of seven months was found positive (*pl. vivax*) in the hyperendemic zone.

In October 130 infants were observed, 53 from the hyperendemic, 77 from the mesoendemic zone. The positive infant of September was still the only one. (Table VI).

#### (2) Entomological Observations

Before spraying, 3,030 vectors of malaria were collected and dissected in the hyperendemic zone of the experimental area of which nine were found infected with sporozoites (0.29 per cent.).

After spraying 1,130 vectors were dissected from the same area of which only one (0.09 per cent.) contained sporozoites.<sup>1</sup>

Since January 1954 are dissected from the comparison area 1,747 vectors of which 14 were positive (0.8 per cent.).

---

<sup>1</sup> Metselaar does not think that density was reduced after spraying.

Conclusions

The results are promising, but further observations are necessary for determination of definite results. We must know what will happen when the draught is finished and after the seventh month of life.

It is intended to repeat a survey of infants and children up to the age of 12 years in the early days of 1955, and a survey of the total population in 1956.

TABLE I.

House	Period	1 - 6 week 9/2/54 - 20/3/54 20 observations						7 - 12 week 21/3/54 - 2/5/54 4 observations						13 - 18 week 3/5/54 - 13/6/54 7 observations						19 - 24 week 14/6/54 - 25/7/54 7 observations						25 - 30 week 26/7/54 - 5/8/54 7 observations					
		DDT		Dieldrin		Control		DDT		Dieldrin		Control		DDT		Dieldrin		Control		DDT		Dieldrin		Control							
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%						
	Dead on Floor	331	66	111	61	-	-	84	65	9	25	-	-	12	16	6	7	-	-	13	35	5	10	-	-	6	40	5	23	-	-
	Dead in traps	68	13.5	63	35	-	-	18	14	25	69	-	-	20	37	42	-	-	-	5	13.5	6	12	-	-	2	13	5	23	-	-
	Dead in trap after 12 hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Dead in traps after 24 hours	63	13.5	7	4	-	-	12	9	1	3	-	-	23	29	31	35	-	-	5	13.5	7	14	-	-	1	7	3	13	-	-
	Dead in traps after 48 hours	5	1	-	-	-	-	7	6	1	3	-	-	9	12	4	5	-	-	8	22	5	11	-	-	3	20	3	13	-	-
	Survivors after 48 hours	30	6	-	-	123	87	8	6	-	24	-	-	13	17	10	11	27	84	6	16	26	53	27	75	3	20	6	28	28	80
	T O T A L	502	100	181	100	141	100	129	100	36	100	37	15	77	100	88	100	32	100	37	100	49	100	47	100	15	100	22	100	35	100
	Survivors after 24 hours	35	7	-	-	-	-	15	12	1	3	33	9	22	29	14	16	32	100	14	38	31	64	37	79	6	40	9	41	30	86

2/3 engorged.



**TABLE II.**  
**HYPERENDEMIC ZONE**

Age	Spleens exam.	Spleens enlarged	Spleen index (%)	Average enlarged spleen acc. Schuffner	Bloodslides exam.	Bloodslides positive	Parasite-carrier index (%)	Heavy infection (%)
0-3 months	22	6	27	0.4	22	1	4	4
4-6 "	17	11	65	1.6	17	9	53	41
7-9 "	17	12	70	1.6	17	10	59	29
10-12 "	11	7	64	1.4	11	9	82	36
1-2 years	151	135	89	2.4	151	125	83	49
3-5 "	180	174	97	2.5	179	131	73	25
6-8 "	189	188	99	2.3	174	115	66	9
9-11 "	125	124	99	3.3	123	57	46	2
12-14 "	94	93	99	3.7	90	32	35	2
15-24 "	232	205	88	1.8	223	64	29	0
females								
25-35 years	139	120	86	1.8	139	31	22	1
36-45 "	92	81	88	1.8	93	21	22	0
45 "	73	58	79	1.8	71	20	28	0
males								
25-35 years	118	112	95	2	118	37	31	0
35-45 "	75	59	77	1.4	76	26	34	0
45 "	55	47	85	1.6	56	21	37	0
<b>T O T A L</b>	<b>1,589</b>	<b>1,432</b>	<b>90</b>	<b>2</b>	<b>1,569</b>	<b>709</b>	<b>45</b>	<b>10</b>

TABLE III.

MESOENDEMIC ZONE

Age.	Spleens exam.	Spleens enlarged	Spleen index per cent.	Average enlarged spleen acc. Schuffner	Bloodslides exam.	Bloodslides positive	Parasite-carrier index per cent.	Heavy infection per cent.
0-3 months	26	5	19	0.2	26	3	11	0
4-6 "	22	13	59	0.8	22	3	14	0
7-9 "	26	15	58	0.6	26	1	4	0
10-12 "	20	11	55	0.6	19	2	10	5
1-2 year.	289	78	32	0.5	208	36	17	4
3-5 "	270	111	41	0.7	270	73	27	6
6-8 "	314	145	46	0.7	310	63	20	4
9-11 "	241	117	49	0.5	238	52	22	4
12-14 "	106	64	60	1	106	27	25	6
15-24 "	297	176	59	0.9	296	56	19	4
females								
25-35 year.	165	77	47	0.7	164	18	11	1
36-45 "	112	56	50	0.8	112	9	11	0
45 "	59	28	47	0.8	59	9	15	0
males								
25-35 year.	132	99	75	1.2	129	12	9	0
36-45 "	111	64	58	0.9	112	15	13	0
45 "	66	33	55	0.7	65	11	17	0
T O T A L:	2176	1092	50	0.7	2161	289	18	3

TABLE IV.  
 COMPARISON AREA

Age.	Spleens exam.	Spleens enlarged	Spleen index per cent.	Average enlarged spleen acc. Schuffner	Bloodslides exam.	Bloodslides positive	Parasite-Carrier rate per cent.	Heavy infections per cent.
0-3 months	8	2	25	0.2	8	4	50	25
4-6 "	18	16	89	2.3	18	13	78	55
7-9 "	16	15	94	3.1	16	15	94	44
10-12 "	7	7	100	3.3	7	7	100	57
1-2 year.	98	92	94	3	97	87	89	39
2-5 "	103	102	99	2.8	103	89	86	25
6-8 "	120	118	98	2.5	120	98	82	12
9-11 "	81	79	97	2.3	81	60	74	11
12-14 "	48	46	96	2.2	47	28	58	2
15-24 "	103	97	94	2	102	34	33	1
females								
25-35 year.	142	128	90	1.9	141	56	39	0.7
36-45 "	55	47	85	1.9	55	27	49	0
45 "	16	9	56	1.4	16	5	31	0
males								
25-35 year.	116	103	89	1.7	116	44	38	0
36-45 "	62	47	76	1.2	61	26	42	2
45 "	10	9	90	1.7	10	1	10	0
T O T A L:	1003	917	91	2.2	998	595	59	11



TABLE V.  
 Examination of Infants on the Day of Spraying in the Exp. Area.

Month of life	1		2		3		4		5		6		7		8		9		10		11		12		Total												
	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+									
Hyperend. exp. zone	6	-	6	7	2	5	13	4	9	13	4	8	6	1	5	5	1	4	5	4	1	10	7	3	6	5	1	5	5	0	4	4	0	92	41	51	
Mesocend. exp. zone	1	-	1	9	-	9	11	12	1	11	14	-	14	9	3	6	15	2	13	4	1	3	12	-	12	8	1	7	9	-	9	14	2	12	118	10	108

TABLE VI.  
 Results of Examination of Infants in Experimental area in October, the 8th Month after spraying.

Month of life	1		2		3		4		5		6		7		8		Total					
	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+				
Hyperend. zone	5	-	5	8	-	8	6	6	-	6	6	-	6	12	-	12	1	1	0	53	1	52
Mesocend. zone	5	-	5	12	-	12	9	7	-	7	14	-	14	14	-	14	9	-	9	77	-	77

TABLE VII.  
 Examinations of Infants in Comprison Area, February and October 1954

Month of life	1		2		3		4		5		6		7		8		9		10		11		12		Total												
	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+	to- tal	+											
Feb. 1954	0	-	2	1	1	0	-	3	1	2	5	4	1	5	4	1	6	4	2	2	1	1	4	4	0	6	6	0	2	2	0	3	3	0	38	30	8
Oct. 1954	5	1	4	4	3	1	4	3	1	5	3	2	5	0	6	3	3	2	2	0	2	2	0	3	2	1	5	5	0	0	-	3	3	0	44	32	12