WORLD HEALTH ORGANIZATION

ORGANISATION MONDIALE DE LA SANTE

REGIONAL OFFICE FOR THE EASTERN MEDITERRANEAN

BUREAU REGIONAL DE LA MEDITERRANEE ORIENTALE

WHO INTER-REGIONAL TECHNICAL MEETING ON MALARIA ERADICATION
TEHERAN, 1 - 6 MAY 1962

EM/ME-Tech.3(a)/5

9 April 1962
ENGLISH ONLY

REPORT ON INDIA/BURMA/PAKISTAN MALARIA COORDINATION ACTIVITIES 1961 *

Representatives of the Governments of Burma, India, Pakistan, World Health Organization and the U.S. Technical Cooperation Mission attended the Conference (the list of participants is given in appendix I).

1. PROGRESS OF THE NATIONAL MALARIA ERADICATION PROGRAMMES

BURMA -

Out of an estimated population of 21.5 million, 19 million were exposed to malaria risk out of which about 5 million live in inaccessible areas. During the year under review, 10.07 million were protected by spraying. Spraying was withdrawn from an area with a population of about 3.5 million and surveillance operations have been instituted.

PAKISTAN -

The pre-eradication survey was completed last year and malaria eradication programmes phased over a period of 14 years with a total expenditure of Rs.52 crores has been approved for the two provinces of the country. Early this year a programme has been

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* Proceedings of the 5th India/Burma/Pakistan Border Malaria Eradication Coordination Conference held at Aijal, Mizo District (Lushai Hills), Assam - India from 27th to 29th November, 1961.-

launched to protect one million sixty seven thousand in West Pakistan and 366,000 in East Pakistan out of a total population of 43 million in West Pakistan and 51 million in East Pakistan.

INDIA -

230 endemic and 160 hypoendemic units each designed to protect one million population are functioning in the country. Intensified spraying operations had been in progress in all the units this year, 92.4 and 98.3 per cent houses have been sprayed during the 1st and 2nd round respectively according to the reports received so far. Surveillance operations have also been instituted in about 344 units. Between January 1961 - September 1961, 9.1 million blood smears have been collected and 6.6 million examined. Only 18,770 were found positive giving a positive case rate of less than 0.1 per thousand per annum in the population under surveillance. The proportional case rate of malaria (i.e. percentage of clinically diagnosed malaria to all diseases) has decreased from 10.8 in 1953-54 to 0.6 per cent this year (up to September 1961). The programme is to enter into the consolidation phase from 1962-63 when it is expected that spraying will be withdrawn from 150 units.

2. IMPLEMENTATION OF THE PROGRAMME IN THE BORDER AREAS AND MATTERS ARISING THEREOF

BURMA -

Burma has 400 miles border area with India and 70 miles with Pakistan; mostly mountainous. Administratively, these borders are in Putao side of Kachin State, Naga Hills and Upper Chindwin in Sagaing Division, Northern and Southern Chin hills and Maungdaw in the Arakan. For operational purposes, the borders are placed under the following malaria units:-

Region 6 :- Kachin state for the Putao side of the Naga hills.

Region 2A:- Naga Khamti units for the Naga hills, Tamu unit for the Chindwin.

Region 4 :- Tiddim, Kaka and Falam units for Northernchins Paletwa unit and Maungdaw unit in the lower border with India and Pakistan.

Geographical reconnaissance indicated a total of 650 villages, 37,887 houses and a population of 238,613. Spraying was carried out in 36,837 houses and 214,573 people were protected. Out of 933 blood smears collected only 11 were found positive. These were found in Taum 5 cases, Tiddim 1 case, Kaka 1 case, Falam 4 cases and Maungdaw 26 cases.

PAKISTAN -

Spraying operations have started only in two districts (Sheikupura in West Pakistan and Dinajpur in East Pakistan). These adjoin the districts of West Dinajpur in West Bengal and Amritsar district of Panjab in India respectively.

INDIA -

Of the 4.25 units in India/Burma border areas i.e. Aijal (Assam) (0.75) and N.E.F.A. (1.50) started functioning in 1957 and Imphal (Manipur) (1.0) and Kohima (Naga Hills) (1.0) started in 1954 and 1960 respectively.

Of the 7.75 units operating on the Indo/Pakistan border area 1.25 are in Assam and 5.50 in West Bengal and 1.0 in Tripura.

During the period from January to June 1961, 363 villages were sprayed in Indo/Burma border areas. The spraying operations covered 17,873 houses and 4,745 cattle-sheds and protected a population of about 90,000. The percentage of missed houses in the border areas was less than one percent.

The data for the 10 miles Indo/Pakistan belt is not available. Spray reports from the units which lie along Indo/Pakistan border in Assam, West Bengal and Tripura show that the coverage of houses reached was 96.8% in both 1st and 2nd rounds.

According to the plan of operation, 20.5 units operating in the border area will continue to ensure total coverage by application of 2 rounds of spray during the entire 3rd Plan period. Surveillance operations are to be initiated in 1965-66.

Enclaves

There are a number of enclaves and land locked areas both in East Pakistan and West Bengal which are not readily approachable from the country to which they belong. The only practical solution of the problem seemed to be that spray operations in these enclaves be carried out by the country under whose areas they happen to be located. The question of surveillance operations is to be deferred for the present as it would be some years before these operations will be instituted.

3. ENTOMOLOGICAL OBSERVATIONS

BURMA -

Density studies and susceptibility status were conducted periodically. A. minimus were found resting inside houses in few numbers while in

previous years was nil. There was no increased tolerance of the vectors to either DDT or Dieldrin. Since no appreciable number of adults were caught no susceptibility tests could be instituted on A. sundaicus. In Coastal area, 100% mortality of A. sundaicus was obtained with 2% DDT concentration. A. culicifacies densities were observed to be higher than past years in some areas and LC_{50} had increased to 0.8% as compared to 0.5 to 0.6 in 1959-60. A.balabacensis was found to be susceptible to DDT. No evidence of indigenous transmission was observed in these areas.

PAKISTAN -

45 anopheline species are present. In East Pakistan, A. philippinensis is considered as the main vector in plains, A. sundaicus in the deltaic region and A. minimus in the hills. The part played by A. culicifacies and A. aconitus requires investigations. In West Pakistan, out of the 17 anopheline species, A. culicifacies, A. superpictus, A. stephensi and A. fluviatilis are suspected vectors. A. superpictus is encountered in Quetta region and A. fluviatilis in foothill areas of Panjab and Frontier Province.

INDIA -

The most significant findings in India has been the development of resistance in A. culicifacies. In the Panchmahal District of Gujarat state the resistance to DDT has continued to persist but there is no evidence of indigenous transmission of malaria in this area in spite of the resistance. In Gujarat and Maharashtra States the tolerance or resistance has been recorded in a larger number of localities than last year. In Rajpipla area of Broach unit in Gujarat State, Dhadgaon in Maharashtra considerable amount of malaria transmission has been recorded in these two areas and A. culicifacies was found to be resistant to DDT. BHC was substituted and there has been a considerable reduction in the vector density and malaria incidence and the situation is being carefully watched.

In the border areas of Assam, the vector A. minimus has been found to be very scarce. However, A. annularis has been found positive in Garo hills. Investigations on secondary vectors such as A. leucosphyrus A. Jeyporiensis etc. in Digboi area of Assam have been started with the assistance of a WHO Team.

4. SPRAYING OPERATIONS IN BORDER AREAS

BURMA -

Spraying in Burma coincides with the pre-monsoons from January to April. There is only one cycle of spraying during the year. The insecticides used are 50% dieldrin w.d.p. in the Arakans and 75% DDT w.d.p. in the rest of the country. Dosages applied are 0.5 grams technical dieldrin and 2 grams technical DDT per square metre of sprayed surfaces.

The performance of Region No.1 and Region No.2 exceeded their targets by 6%. Regions 3, 4, 5 and 6 gave a performance of 97, 96, 82 and 97% respectively.

The percentage of unsprayed houses in the areas under spraying was 3.4%. Regions 3, 6 and 5 the percentage of unsprayed houses were 6.8, 5.5 and 3.6% respectively. The number of unsprayed houses in Region 3, 6 and 5 had been due mostly to locked houses.

PAKISTAN -

According to the recommendations of the WHO Malaria Demonstration Team (1951) spraying operation in East Pakistan were initiated in March with a single spraying cycle and a dosage of 2 g. of DDT sq.m.

In West Pakistan, however, taking into consideration the transmission season, the rainy season and local habits of people for repairing and replastering of houses it has been decided to cover sprayable surface by DDT w.d.p. one gm/sq.m. per round in two successive rounds of spraying. The first round to start in June and the second in August.

INDIA -

In India, two rounds of DDT spraying are generally carried out at a dosage of 100 mg/sq.ft.

a) Indo/Burma Border

Spraying operations within the 10 miles belt of Indo/Burma border were carried out from January 1961 at a dosage of 200 mgm/-sq.ft. according to the logistics as previously agreed to.

The details of the spraying in different areas are as given below:-

State	No.of villages sprayed within 10 miles belt of Indo/Burma Area	No. targeted		No. sprayed	
		H.D.	C.S.	H.D.	C.S.
1. Assam	134	9762	1852	9759	1852
2. N.E.F.A.	21	1122	586	1119	581
3. Manipur	195	4800	1920	4793	2312
4. Naga Hills	13	2341	-	2202	-
	363	18025	4358	17873	4745

b) Indo/Pakistan Border

Spraying operations were carried out from May to October, 1961. Spraying data for 10 miles belt of Indo/Pakistan border is not available separately. The available information for the entire units in Assam, West Bengal and Tripura which are along the Indo/Pakistan border is given below:-

State/Unit (1)	Spraying round (2)	Number targeted (3)	No. of houses sprayed (4)	Percent coverage (5)	Cattle sheds sprayed (6)
1. West Bengal					
Cooch Behar	I	276005	274198	99.3	164319
	II	279935	277409	99.1	185267
Jalpaiguri	I	129354	127510	98.6	89347
	II	132043	128800	97.6	89584
Siliguri	I	67408	65631	97.4	38554
	II	71964	70713	98.2	40466
West Dinajpur	I	260686	257827	98.9	190366
	II	254948	252698	99.1	193722
Malda	I	224770	207976	92.5	110835
	II	222682	205323	92.2	110518
Murshidabad (S)	I	245988	243382	98.9	149624
	II	238322	236926	99.4	145608
Murshidabad (N)	I	226037	225171	99.6	102917
	II	233435	233028	99.8	112167
Nadia	I	321949	319064	99.1	148378
	II	320034	318009	99.4	149507
Baraset	I	207232	179668	86.7	91871
	II	215481	194769	90.4	90162
Basirhat	I	176152	171406	97.3	106585
	II	174281	169110	97.0	102984
TOTAL (I)	I	2135581	2071833	97.0	1192796
(II)	II	2143125	2086785	97.3	1219985

Contd.

(1)	(2)	(3)	(4)	(5)	(6)
2. Assam					
Tura	I	157470	154232	97.8	38243
	II	153833	150627	97.9	38399
Shillong	I	79959	65729	82.2	56869
	II	71836	56608	78.8	41461
Karimganj	I	219262	213604	97.4	85908
	II	222357	219348	98.6	86904
TOTAL (I)	I	456691	433565	94.9	181020
(II)	II	448026	426583	95.2	166764
3. Tripura					
Agartala	I	207250	206669	99.7	-
	II	211436	199965	94.5	-
GRAND TOTAL	I	2799522	2712067	96.8	1373816
	II	2802587	2713333	96.8	1386749

5. SURVEILLANCE OPERATIONS IN BORDER AREAS

BURMA -

The results of surveillance performed during the last quarter of 1959 show that over a population of 3.5 million only 21 positive were detected out of 7,069 blood smears taken during surveillance. In 1960, intensive surveillance was continued in an area of about 4.9 million population with the following results:-

Total population under surveillance - 4.9 million

Blood smears taken ... ... - 105,978

Positives ... ... - 202 (Imported and relapse).

The surveillance data collected in 1959-60 showed that an area with a population of 3.5 million satisfied the criteria for withdrawal of spraying and in this consolidation area of 3.5 million people surveillance data so far accrued for 9 months period January-September, 1961 as follows:-

First Quarter	21569	Blood Smears	13	Positive
Second Quarter	18973	"	38	"
Third Quarter	53026	"	47	"
TOTAL:	93568	"	98	"

Ninety-eight cases had been epidemiologically investigated, of which 72 were imported from outside, 16 were relapses and 10 cases could not be traced. The examination rate works out to 2.7% while the parasite rate works out to 0.002%. In a pre-consolidation area with a population of two million, intensive surveillance was performed from June to September and showed that 7846 blood smears were examined out of which 59 were found positive. Similarly, out of the thirty-nine epidemiologically investigated, 17 were found indigenous, 1 relapse and 21 imported from the attack phase areas, and in the areas under case finding and treatment, having a population of 7.1 million in 1960, 67,971 blood smears were collected of which 655 were positive. In 1961 during the same months in a total population of 9.5 million, 42241 blood smears were collected and examined of which 518 were positive. The greatest number of positives was found in Region 3.

PAKISTAN -

As already mentioned earlier, the programme in Pakistan has only been initiated in the two districts, which is also in the initial stage. Therefore, the question of surveillance operations as far as Pakistan is concerned does not arise.

INDIA -

According to the Indian programme surveillance is to be instituted in 364.5 units out of 390, leaving 25.5 border and problem area units. Surveillance in border and problem area units is proposed to be instituted from 1965-66 as envisaged at present. The details of the surveillance have already been discussed earlier under Agenda item 6.3. Although routine epidemiological surveys have been discontinued since the institution of surveillance, yet the data collected so far in respect of India as a whole and border areas is given in Appendix III. Since Burma has already started surveillance in the border area, India may do likewise wherever possible at an early date.

6. DRAFT QUESTIONNAIRE as approved by the Conference is given in Appendix IV.

7. MISCELLANEOUS

1. The effectiveness of one round of spraying operations with 200 mg. DDT per sq. as envisaged under the Pakistan programme vis-à-vis two rounds of spraying with 100 mgm/sq.ft. as was being carried out in India and Burma, was discussed. Field experiments on the efficacy of various dosages of DDT are in progress in Pakistan and results will be made available next year.

2. The spray timings on both sides i.e. India and Pakistan were discussed since there was about two months' difference in the commencement of spray operations in West Bengal and East Pakistan. The consensus of opinion appeared to be that the spray timings should be adjusted by mutual consultation so that there was as little difference as possible in the spray timings.

3. Dr. Sambasivan of the WHO pointed out that in almost all the international meetings the agenda has to be approved by all the member countries in the first instance. It was, therefore, decided that in future, the agenda with the working papers should be sent in advance to all the member countries.

8. NEXT MEETING

The Pakistan delegate proposed that the sixth Burma/India/Pakistan Malaria Eradication Border Conference should be held in Pakistan subject to the approval of his Government and the date of the meeting should be decided by the three member countries by mutual consultations.

9. RESOLUTIONS

I. Recognising the importance of prompt exchange of technical reports for the coordination of Malaria Eradication Programme in the member countries and for taking timely action,

and

Realising the delay involved in transmitting reports through the usual channels:

The Conference recommends:-

(a) Exchange be made of annual reports of the Malaria Eradication Programme of the entire country and quarterly reports as per proforma approved by the Conference in respect of border areas,

(b) Copies of such reports be sent direct to the Chiefs of Malaria Eradication Programmes of the member countries in addition to those submitted through the usual Channels, and

(c) The Chiefs of Malaria Eradication Programme of the member countries may exchange information directly on technical matters of mutual interest to facilitate prompt and coordinated action in the border areas.

II. Noting with satisfaction that these Conferences and technical discussions have been of immense value in coordinating Malaria Eradication activities of the member countries,

The Conference recommends:-

(a) These meetings be called Burma/India/Pakistan Border Malaria Eradication Coordination Conference.

(b) The draft agenda be circulated and the working papers exchanged in advance of the meeting.

III. Recognising the importance of border maps for coordinating Malaria Eradication activities,

The Conference recommends:-

That maps of border areas be exchanged showing the location of border units.

IV. Having reviewed the overall progress of the Malaria Eradication Programme particularly spray operations,

The Conference recommends:-

(a) The schedule of spraying in border areas between Burma and India as previously agreed upon should continue.

(b) The spray timings in border areas of West Dinajpur, Jalpaiguri and Cooch-Behar districts in West Bengal be adjusted to coincide with the spray timings in corresponding areas of Dinajpur and Rangpur districts of East Pakistan.

(c) The dosage and cycles to be followed should be according to the existing policy in the respective countries.

V. Having studied the problem of land locked enclaves and isolated territories of neighbouring countries within the political boundaries of one another,

and

Realising the importance of total coverage in respect of spray operations in these enclaves,

The Conference recommends:-

(a) Spray operations be undertaken by the country within whose territory such enclaves are located.

(b) Respective Governments be approached to extend necessary facilities for smooth and prompt execution of the above operations.

VI. Having reviewed the entomological data available from the member countries,

and

Realising the importance of employing uniform entomological techniques,

and

Noting with satisfaction that studies have been initiated in the member countries on secondary vectors,

The Conference recommends:-

(a) Standardised entomological techniques be adopted after consultation among the member countries.

(b) Wherever secondary vectors are suspected as the cause of residual malaria in spite of adequate spray coverage prompt studies be undertaken to elucidate the role of secondary vectors in these areas.

VII. Noting with satisfaction that the Malaria Eradication programme in border areas of Burma has advanced to a degree that Burma is ready to institute surveillance operations in the border areas,

The Conference recommends:-

That India should take immediate steps to institute surveillance operations wherever possible in the border areas.

VIII. The Conference,

Thanks the delegates from Pakistan for inviting the next meeting to be held in Pakistan, subject to the approval of their Government, during the last quarter of 1962, preferably in November. The exact dates to be decided after mutual consultation by the member countries.

IX. The Conference,

Records its appreciation to the authorities of Mizo District, and the Director of Health Services, Assam, respectively for extending warm welcome to the delegates, making the necessary arrangements for holding the meeting in the District Council Hall, Aijal and for field visits.

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Appendix I

LIST OF THE PARTICIPANTS WHO ATTENDED THE FIFTH INDIA/BURMA/PAKISTAN BORDER ANTIMALARIA COORDINATION CONFERENCE, HELD FROM 27TH TO 29TH NOVEMBER, 1961.

BURMA

1. Dr. Po Myaing	Assistant Director of Health Services, (Malaria Branch), Burma.
2. Dr. Gerardo L. Adan	World Health Organization, Senior Malariologist Rangoon, Burma.
3. Dr. C. Pant	WHO Entomologist, Rangoon, Burma.

PAKISTAN

1. Lt. Col. M.K.Q.Hashmi	Director, Malaria Eradication Programme, Pakistan.
2. Dr. A.B. Paltrinieri	WHO Senior Malaria Adviser, East Pakistan.

WORLD HEALTH ORGANIZATION

1. Dr. G. Sambasivan	Senior Regional Malaria Adviser, S.E. Asia, WHO, Patiala House, New Delhi.

USTCM

1. Dr. Melvine Griffith	Regional Malaria Adviser, SEAAID, TCM, New Delhi.
2. Dr. R. Laird	USTCM Entomologist, attached to the NMEP, New Delhi.

INDIA

1. Dr. A.P. Ray	Director, National Malaria Eradication Programme, India.
2. Dr. Rajindar Pal	Deputy Director, NMEP, HQ, New Delhi.
3. Dr. B.L. Choudhury	Director of Health Services, Assam.
4. Dr. N. Ganguli	Deputy Director of Health Services (IBD), West Bengal.
5. Dr. A.B. Roy	Deputy Director, Health Services, Assam.
6. Dr. W.C. Malhotra	Director of Health Services, Manipur.
7. Dr. H.M.I. Srivastava	Assistant Director, Regional Coordinating Organization, NMEP, Shillong.
8. Dr. B.N. Bhattacharjee	Assistant Director, Regional Coordinating Organization, NMEP, Shillong (Assam)
9. Dr. S.C. Bhattacharjee	Malaria Officer, NEFA, Shillong.
10. Dr. K.N. Ghosh	Malaria Officer, Tripura, Agartala.
11. Dr. I.B. Mukherjee	Assistant Malaria Officer, Imphal, Manipur.
12. Dr. Y. Bhagya Singh	Assistant Malaria Medical Officer, Manipur.
13. Sh. K.C. Bagchi	Asst. Unit Officer, Nagahills.
14. Dr. M.D. Aftabuddin	Asst.District Health Officer, Cooch-Behar.
15. Dr. Rohawka	Asst. Malaria Officer, Aijal, Assam.
16. Sh. S.K. Jain	Publicity Officer, NMEP HQ, New Delhi.

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Appendix II

AGENDA FOR THE FIFTH INDIA/BURMA/PAKISTAN BORDER ANTI-MALARIA COORDINATION CONFERENCE (AIJAL)

1. Welcome address.
2. Inaugural address by the Chief Executive Member of the District Council, Aijal at 10 A.M.
3. Reading of messages.
4. Election of Chairman and Rapporteurs.
5. Reading of resolutions passed at last Conference held in Mandalay, Burma.
6. Statement of progress of the National Programmes with reference to:-

6.1 Burma

6.2 Pakistan

6.3 India

7. Discussions on the implementation of the programme in the border areas and matters arising thereof. -

7.1 Burma

7.2 Pakistan

7.3 India-Assam, Manipur, NEFA, Naga Hills and Tripura.

8. Provision of border units - accomplishments - in 1961 and future plans.
9. Entomological observations in border areas.-

9.1 Burma

9.2 Pakistan

9.3 India

10. Surveillance in border areas.-

10.1 Burma

10.2 Pakistan

10.3 India

11. Spraying in border areas.-

11.1 Burma

11.2 Pakistan

11.3 India

12. Draft questionnaire for reports.-
13. Miscellaneous.
14. Next Meeting.
15. Resolutions.

INDIA

EPIDEMIOLOGICAL DATA INDICATE A CONSIDERABLE OVERALL REDUCTION IN SPLEEN PARASITE INDICES THROUGHOUT THE COUNTRY DURING 1960-61 AS COMPARED TO 1953-54.

	1953-54	1960-61	% Reduction
(a) Spleen rate	15.7	0.8	94.1
(b) Child parasite rate	3.9	0.1	97.9
(c) Infant parasite rate	1.6	0.04	97.5

INDO/BURMA BORDER

State	Child spleen survey			Child parasite survey			Infant parasite survey		
	No. examined	No. positive	Rate	No. examined	No. positive	Rate	No. examined	No. positive	Rate
1. Assam	938	4	0.4	157	-	0.0	-	-	-
2. NEFA	287	4	1.4	73	-	0.0	127	5	3.9
3. Manipur	476	43	9.0	128	-	0.0	140	2	1.4
4. Naga Hills	208	79	38.0	8	1	12.5	-	-	-
TOTAL	1909	130	6.8	366	1	2.73	267	7	2.6

INDO/PAKISTAN/BORDER

EPIDEMIOLOGICAL DATA

State/Unit	Child Spleen Survey			Child Parasite Survey			Infant Parasite Survey		
	No. examined	No.positive	Rate %	No.examined	No.positive	Rate %	No.examined	No.positive	Rate %
1. West Bengal									
CoochBehar	10364	111	0.1	1863	-	0.0	79	-	0.0
Jalpaiguri	13574	135	1.0	7963	-	0.0	472	-	0.0
Siliguri	2640	82	3.1	485	5	1.0	46	-	0.0
West Dinajpur	21739	81	0.4	13780	-	0.0	1774	-	0.0
Malda	6290	7	0.1	12810	-	0.0	1824	-	0.0
Murshidabad (S)	-	-	-	9066	-	0.0	493	-	0.0
Murshidabad (N)	4617	-	0.0	12588	-	0.0	920	-	0.0
Nadia	7210	4	0.06	21677	-	0.0	4138	-	0.0
Baraset	6216	-	0.0	6005	-	0.0	751	-	0.0
Basighat	12914	1	0.01	2233	-	0.0	1133	-	0.0
Total:-	85563	421	0.2	88470	5	0.0	11639	-	0.0
2. Assam									
Tura	2310	173	6.8	1556	63	4.0	258	4	1.6
Shillong	1119	56	5.0	1085	5	0.5	125	18	14.4
Karimganj	3627	20	0.6	3264	-	0.0	499	-	0.0
Total:-	7256	249	3.4	5905	68		882	22	
3. Tripura									
Agartala	5844	277	4.7	5844	39	0.7	666	16	2.4
GRAND TOTAL:	98666	947	1.0	100219	112	0.1	18187	58	0.4

QUESTIONNAIRE FOR QUARTERLY REPORT ON MALARIA ERADICATION

1. General

Country ..... Year .....
(Period)

2. Geographical reconnaissance (of border areas up to 10 mile belt).

(a) Area in sq.km/sq.mile
(b) Population
(c) Number of villages
(d) Number of premises
(e) Insecticides in use
(f) Dosage applied

3. Progress (a) Spray activities

(i) Date commencement (ii) Date completion (iii) Coverage.

4. Epidemiological assessment

A. Malariometric survey

District or area or sub-unit.	Spleen survey		Child parasite survey		Infant parasite survey	
	Examined	Rate	Examined	Rate	Examined	Rate
1	2	3	4	5	6	7
TOTAL:						

B. Case detection

(i) No. of fever cases
(ii) No. of blood smears
(iii) No. positive
(iv) No. positive as detected by epidemiological survey as above.
(v) Classifications

Species of malaria parasites	No. of infants
P. vivax	
P. falciparum	
P. malariae	
Mixed	

C. (a) Surveillance activities

District or area or sub-unit.	Population	No. of houses visited	Achievements	No. of fever cases detected	No. of blood smears			No. positive detected by epidemiological survey.	No. given radical treatment.
					Collected	Examined	Positive		
TOTAL									

(b) Details of positive cases

District or area or sub-unit.	No. of positive					Number					
	Total	P.v	P.f	P.m	Mx	Indigenous	Relapse	Imported	Introduced	Induced	Not Invest.
TOTAL											

5. Entomological data

(1) Transmission season

(2) Density of vectors

(3) Record of susceptibility tests

(4) Secondary vectors if any

(5) Any other entomological information