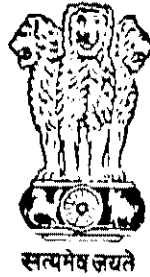


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GOVERNMENT OF TRIPURA

**EVALUATION REPORT ON  
NATIONAL MALARIA ERADICATION PROGRAMME  
IN TRIPURA**

EVALUATION ORGANISATION  
GOVERNMENT OF TRIPURA

P R E F A C E.

At the instance of the Director of Health Services, the Evaluation Organisation undertook a study of the Scheme "National Malaria Eradication Programme in Tripura". The present study was undertaken to review the progress of the Programme, to examine the difficulties involved in execution and to assess its impact on general people.

We are grateful to the Director of Health Services, Malaria Officer and the staff of this Programme for generous assistance and co-operation extended to us in the conduct of this study.

The field survey was conducted by Shri D. Bhattacharjee, Evaluation Officer, and the report was also prepared by him. The concerned staff of this Organisation have also rendered useful service in making this study a success.

Dated, Agartala, 0  
0  
the 16th October, 1974. 0

J. Saha,  
Senior Statistical Officer,  
Tripura.

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NATIONAL MALARIA ERADICATION PROGRAMME.:

Malaria is a very old disease and a public health problem in the state. Most of the part of the state is hilly and communication links are poorly developed. The population of the state is not homogeneous, there are numerous tribes and about 90% of the population is engaged in Agriculture, plantation, settlement scheme, land reclamation etc. associated with extensive movement of people, which creates favourable condition for malaria transmission. The incidence of malaria cases was also aggravated because of continuous immigration of refugees from East Pakistan ( Now Bangladesh ).

With a view to reduce the incidence of malaria in the country the National Malaria control programme started functioning in India in the year 1953 with the objective of bringing down the ~~ind~~ incidence of malaria to such an extent that this would not be regarded as a major public health problem ~~and~~ any more.

After reviewing the activities of National Malaria Control Programme, it was found that eradication of malaria from the country was possible and the National Malaria Control Programme was switched over to National Malaria Eradication Programme from April, 1958. The object of National Malaria Eradication Programme has been as " the ending of ~~trans~~ transmission of malaria and reservoir of infection cases in a campaign limited in time, carried to such a degree of perfection, that when it comes to an end and there is no resumption of transmission". Although the Malaria Eradication Programme has ~~k~~ the following phases :- 1). Preparatory phase, 2). Attack phase, 3). Consolidation phase, 4). Maintenance phase, the National Malaria Eradication Programme in India started functioning from Attack phase creating the result achieved under Control Programme as end point of preparatory phase. In Tripura, the National Malaria Control Programme was launched in July, 1953 with <sup>1/4</sup> of standard unit which was subsequently raised to one Unit.

The National Malaria Control Programme was switched over to National Malaria Eradication Programme with effect from 1st April, 1958 with the objectives stated earlier. As per programme in the last year of attack phase surveillance activities were introduced which envisaged domiciliary visit at least once in a fortnight for collecting blood smears from all fever cases and cases with recent history of fever irrespective of clinical diagnosis and impost presumptive treatment on having blood-smears and send all <sup>blood</sup> smears to the laboratory for microscopic examination. The malaria positive cases detected by microscopic examination are imparted radical treatment for 5 days as per scheduled doses.

The study was undertaken ~~xx~~ at the instance of Director of Health Services vide their letter No.4(317)-MS/AC/71 dated 22-5-72. The field survey was started on the 4th May, 1974 and was completed on the 9th June, 1974 with the objectives noted below :-

Object of the Study:-

The programme covers the whole State and owing to our limited resources it is not possible to deal with all the aspects of the programme. In order to narrow down the area of study to a manageable ~~xxx~~ portion it was thought advisable to focus attention on the following aspects :-

1. To enumerate different sorts of facilities provided to the people under the National Malaria Eradication Programme.
- 2). To determine the extent of such facilities enjoyed by the people.
- 3). To ascertain the reaction, attitude of the respondents towards this Programme.
- 4). To assess the progress achieved in implementing the programme and
- 5). To study the problems of implementation of the programme at different levels.

Sampling design and Methodology:-

The National Malaria Eradication Programme Unit of Trivara with

its Headquarters at Agartala has been divided for administrative purpose into 4 Zones :- A. B. C. and D.

Zone A with its Hd.quarters at Kailashahar covers 2 Sub-Units - Dharmanagar and Kailashahar Sub-Divisions. Zone B with its Hd.quarters at Teliamura covers 3 Sub-Units - Kamalpur, Khowai and Amarpur sub-divisions, Zone C with its Hd.quarters at Agartala covers 2 sub-units - Sadar and Sonamura sub-divisions and Zone D with its Hd. quarters at Udaipur covers 3 sub-units - Udaipur, Belonia and Sabroom sub-divisions. Each Sub-Unit has been sub-divided into a number of small sectors and each sector into a number of smaller sections, A section covers a number of villages & each of which consists of a number of households, the ultimate sampling units in the evaluation study.

For evaluation study the sampling design adopted is stratified multi-stage random sampling with household as the ultimate unit. From each of the 4 zones one sub-unit was selected. Thus Kailashahar in Zone A, Khowai in Zone B, Sonamura in Zone C and Belonia in Zone D were selected as sub-units. Then a list of sectors was prepared sub-unit-wise. 2 sectors were selected out of 5 in Kailashahar, 2 out of 6 in Khowai, 2 out of 4 in Sonamura and 2 out of 7 in Belonia. Thus sector numbers 11 and 12 in Kailashahar, sector numbers 17 and 22 in Khowai, sector numbers 46 & 48 in Sonamura and sector numbers 56 and 59 in Belonia were selected. At the third stage sample sectors were selected from selected sectors. For this, a list of sections was prepared sector-wise for selected sectors and 2 sample sections were drawn from each. The sections so selected with the total number of villages in selected sectors are shown in the table below :-

Table No.1.

Sub-Units	Selected Sectors.	Selected Sections	Total number of villages in selected sections.	
Khowai	Sector No. 17	Section Nos 67 & 69	4 6	
		Sector No. 22	Section No. 88 90	3 3
	Kailashahar.	Sector No. 11	Section Nos. 42 45	4 8
Sector No.12			Section Nos. 47 46	7 5
Sonamura		Sector No.46	Section Nos. 180 183	1 2
			Sector No.48	Section Nos. 189 192
	Belonai.	Sector No.56	Section Nos. 221 225	1 10
			Sector No.59	Section Nos. 234 235

For each of the above selected sections a list of villages was prepared and 10% of the villages were included in the sample for investigation. Then for each of the selected villages a list of households was prepared and nearly 25% of the households were selected at random for study. The whole scheme of sampling at various stages is given in the table below.



Table No.2.

Sampling design:-

Zone	Selected sub-units.	Selected sectors.	Selected sections.	No. of villages selected	Total no. of houses in selected villages.	No. of Households selected.	
B	Kailashahar.	Sector No. 11	Sec.No.42	4	94	24	
			Sec.No.45	8	210	52	
		Sector No. 12	Sec.No.47	7	312	77	
			Sec.No.46	5	160	40	
	A	Khowai.	Sector No. 17	Sec.No.67	4	219	55
				Sec.No.69	6	225	56
		Sector No. 22	Sec.No.88	3	330	88	
			Sec.No.90	3	101	25	
C.	Sonamura.	Sector No. 46	Sec.No.180	1	294	74	
			Sec.No.183	2	416	104	
		Sector No. 48	Sec.No.189	1	220	55	
			Sec.No.192	2	207	52	
D.	Belonia.	Sector No. 56	Sec.No.221	1	133	33	
			Sec.No.225	10	176	46	
		Sector No. 59	Sec.No.234	2	162	40	
			Sec.No.235	1	283	71	

Salient feature of the Programme:-

Proceeded by a five-year National Malaria Control Programme

starting in 1953, the National Malaria Eradication Programme was launched in 1958 with the objective of eradicating malaria from India in 7 to 9 years or by 1965 to 1967. In 1964 the schedule was revised to a termination date of 1970, in 1967, it was again revised to the present target of 1975.

The salient feature of the programme as implemented throughout the country is given below. The basic "principles" on which the programme was founded were :-

1. The indoor residual spraying of D.D.T. in all appropriate structures at appropriate seasons and intervals would reduce malaria transmission to a very low level in a few years.
2. The institution of a system of "surveillance" i.e. detection and radical cure of the malaria cases and other remedial measures when the transmission levels were low, would result in the complete elimination of malaria.
3. The public health organisation in the country would assume responsibility for "vigilance" and undertake preventive action against re-establishment of malaria, once the elimination of the parasite has been achieved.

The programme was divided into several phases succeeding each other on the basis of careful evaluation.

Preparatory phase:

During which malaria surveys and epidemiological investigation would be carried out in some depth to enable formulation of the details of the action. This phase is generally expected to be of one year's duration. In the National Malaria Eradication Programme of India, the preparatory phase was not considered necessary because the country has already been under a nationwide control programme for five years and it was thought that adequate information was available on the distribution and epidemiology of malaria for practically all places.

Attack phase:

The internal surface of all man-made structures (human and animal dwellings) were to be sprayed with residual insecticides (D.D.T. being the first choice) at selected doses at appropriate intervals and seasons.

This phase was to last normally for three years. During the last year of this phase " Surveillance" was to be established.

Consolidation phase:

The insecticide spraying would be withdrawn and surveillance procedure carried out thoroughly. Active and passive methods were to be adopted for case detection and radical treatment of all parasite positive cases to be given by the staff of the programme.

Maintenance phase:

The entire vigilance was to be assumed by the basic public health organisation whose duty would be to keep watch for cases of malaria which may arise because of reintroduction, relapse or any other cause and to take prompt and effective remedial and preventive measures. For the execution of the National Malaria Eradication Programme, the entire area of the country was distributed among 390 Units ( later increased to 393'25 ). The work was directed from the centre, but executed by the states with financial assistance from the centre.

At the central level, the programme was directed by the Director, National Malaria Eradication Programme with supporting technical and administrative staff at his Hd. quarters at Delhi. The Director was assisted by six Regional Coordinating Organisations located at Baroda, Bangalore, Hyderabad, Lucknow, Bhubaneswar and Shillong, each of which was under the charge of a Deputy Director.

At the State level the work was directed by the respective Directors of Health Services/Public Health with a full time state Malaria-ologist, ( designated differently in different States) as the technical and administrative head.

The "units were the actual operating organisations on which the whole pyramidal edifice was built. The unit, on an average, was expected to cover population of one million but there have been substantial variations, some units covering a population of over 1.5 million and a few even as low as 0.5 or 0.25 million. The unit was under the charge of a unit officer, variously designated as malaria officer, malaria medical officer etc. Mostly they were medically qualified persons, but in a few states non-medical personnel (University graduates in science) were appointed to these positions. In some states there were zonal officers looking after 3-4 Units and even Regional malariologists and entomologists, looking after the work of 7-10 Units.

Spraying squads and logistics of spraying:

Proper spraying operation depends on the size of the spraying squads according to the size of the area of operation. There were 44 spraying squads in Tripura during the year 1971-72 and 1972-73 ( each squad comprising of one mate and five labourers ). During the year 1973-74, 74 squads were operating in Tripura and these are still continuing. The spraying operation is being conducted as per prescribed dose (generally 1 gram per sq.metre).

Date of spraying vary in different parts of our country. The spraying operation starts as early as March in some states. Generally two rounds of spraying operation are carried out - one during March to May ( 75 days) and another during August to November ( for 75 days ) in Tripura. During 1972-73 and 1973-74 spraying operation was started in Tripura a bit later than the scheduled date mentioned above. Even in 1974-75 the first round of spraying operation, it is learnt, was started on the 1st May of 1974. Logistic of spraying is the most vital factor for effectiveness of operation. So timely spraying is essential.

Surveillance Activities:

Active surveillance was introduced in Tripura as desired by the Government of India, Ministry of Health as per recommendations of the Director, National Malaria Eradication Programme, Delhi in April, 1966. Spraying and Surveillance works are now in operation. The entire unit has been divided into 262 surveillance sections and 64 sectors. Villages of each section has been divided in 12 groups from 1 to 12 and one Surveillance Worker has been put as basic worker in each section. There are 12 field working days in a fortnight and the surveillance worker is to visit each and every group in specified working day and to put 4 questions and collect blood smears from all fever cases and cases with recent history of fever irrespective of clinical diagnosis and impart presumptive treatment by 4 aminoquinolines as per scheduled doses and put his dated intial in the house-cards or house-stencil as a token of performance of his duty. The surveillance worker is to send blood smears at least twice in a week for laboratory examination. The ~~xxx~~ results of the examination would require to be communicated to the concerned Surveillance Inspector who is the sector in-charge, for imparting radical treatment for 5 days personally contacting the patient in his house.

Administrative arrangement for implementation of the Programme:

The National Malaria Eradication Programme has been under imple-  
mentation in Tripura since 1958 under the direct control of the Director of Health Services and the Malaria Officer is, in overall charge of works connected with the D.D.T. spraying and timely distribution of insecticides. He is supposed to be completely aquinted with all problems and ~~diffaxnx~~ difficulties regarding surveillance activities and be responsible for immediate action whenever necessity arises in his unit.

For administrative convenience the State is divided into 4 zones and an Assistant Unit Officer is in-charge of each zone for proper functioning of the programme. Each Zone consists of some sub-units and each sub-unit has a number of sectors and sections. There are 60 sectors and 426 sections in Tripura under this programme. The main functions of the officials are given below in a nutshell.

**Zonal Office:-** Assistant Unit Officer is in-charge of each zone. He is responsible to the Malaria Officer in respect of proper implementation of surveillance work and spraying in his zone.

**Sub-Unit:-** Malaria Inspector is in independent charge of spraying and surveillance work in the sub-unit viz. sub-division. He is to submit various reports and returns in connection with this programme to his higher authority.

**Sector :-** One Surveillance Inspector is posted in each sector as in-charge of the sector. Each Surveillance Inspector will be responsible for the planning and execution of surveillance work by the surveillance workers under him. He will also be responsible for administration of radical treatment and for maintaining normal routine of surveillance work. He will maintain all records and data for surveillance procedure in his area and submit regular reports to the Malaria Officer.

**Sections :-** One Surveillance worker is posted in each section. He will be responsible for surveillance work for a population of 10,000 residing in 2,000 houses. But this norm regarding coverage of population and houses is flexible in Tripura  $\frac{2}{3}$  of which is hilly where houses are scattered and there are immense difficulties of transport and communication. He will visit each house in his area once in a fortnight and record all ~~the~~ necessary information.

He will collect blood smears from all fever cases in the households at the time of his visit. He will administer a single dose treatment with 4-~~amino~~ aminoquinoline drug to all fever cases after collection of the blood smears. He is to despatch blood smears with necessary particulars to the unit Hd. quarters for laboratory examination. A chart of the administrative unit of the programme is given in the Appendix No.1 and Appendix No.2 also indicates the staffing pattern of the unit during the year 1974-75.

Financial Aspect:-

The National Malaria Eradication Programme in this state is in Attach phase. The entire expenditure on the Attach phase and consolidation phase of Malaria Unit during the 4th plan ~~xxxxx~~ period was treated as plan expenditure in the centrally sponsored sector subject to the deduction on the level of expenditure being incurred by the state Government in 1957-58 when the Malaria Control Programme was switched over to the National Malaria Eradication Programme which is the responsibility of the state government as a part of their committed liability. It has further been decided that the entire central assistance under the programme during the 4th plan period was to be treated as 100% grant to the state government and Union Territory Administration. Besides this, 90% of the expenditure is re-imburseable from the central Government as plan expenditure for Hd. quarters staff where maintenance phase unit is less than 1/3.

For proper implementation of this programme one difficult and boarder area spraying unit was sanctioned by the Government of India for this state taking into consideration of the peculiar geographical position and difficult topography. In view of the above position the unit is still functioning in Attach phase.

The Working Group on Health in the meeting held in New Delhi on the 7th October, 1968 recommended the provision of 127,000 lakhs for the 4th plan period in order to strengthen this Unit. The actual Budget Provision and expenditure for the period from 1971-72 to 1973-74 is given below.

Year.	0 Budget Provision.	0 Actual Expenditure.	0	Remarks.
(1)	(2)	(3)	(4)	(4)
1971-72.	16'00 lakh.	13'72 lakh		During 1971-72 spraying operation could not be started due to Indo-Pak war.
1972-73.	17'959 "	17'17 "		
1973-74.	19'53 "	19'36 "		
1974-75.	19'64 "	10'135 lakhs upto Sept., 1974.		

Progress of the Scheme:-

In Tripura the National Malaria Eradication Programme started functioning from 1st April, 1958 with one difficult and boarder Unit. Although, one unit is to cover one million population. Tripura was provided with one difficult unit while its population was less than a million at that time - considering various factors like its hilly area, dispersed population, undeveloped transport and communication facilities, its encirclement by erstwhile East Pakistan ( Now Bangladesh), heavy continuous influx of refugees from East Pakistan etc.

Although there are four phases of the programme yet this programme is still in Attack Phase in the state. In Attack Phase residual insecticidal spraying operation is the main weapon when timely total insecticidal coverage both qualitative and quantitative would cut down the transmission of malaria parasite.



Entire Tripura was divided into four areas viz. (A) most difficult area with difficult communication, (B) difficult area with less difficult communication, (C) easy area with a bit difficult communication and (D) Road-side villages and urban area with easy communication. As per original logistic of spraying A and B areas will have to be rendered total insecticidal coverage with three rounds of spray and C and D by two rounds of spray so that ~~the~~ total cut down of transmission of malaria parasite may be achieved. If this programme could run 3 to 5 years very effectively with total cut down of ~~the~~ transmission, the programme may switch over to next phase of consolidation with introduction of Surveillance ( both active and passive ) in the last year of Attack phase.

But the performance of the programme in this state is unsatisfactory. Even the coverage of the programme is also not upto the mark as it is evident from the following table. Although the programme was designed to cover the whole area of the state yet it appears that the ~~effort~~ effort was mainly concentrated on the Boarder Areas as it was decided in the Indo-Bangladesh conference that the D.D.T. spraying operation will be confined to 10 miles boarder-belt of Indo-Bangladesh Boarder area. If this is the programme of the present spraying operation than it is natural that the areas beyond 10 miles boarder will ~~be~~ remain unsprayed and there is every possibility of transmitting malaria in the areas which are remaining beyond the boarder area. It is necessary to maintain spraying operation throughout the state with special emphasis on the Boarder Area in order to drive out the malaria from the state.

The spraying operation as implemented in Tripura from 1971-72 to 1973-74 is not satisfactory. During 1971-72 no large scale operation (except some selected places) was done. Data in respect of the progress of the scheme is presented here for the period from 1972-73 to 1973-74.

Progress of spraying operation in different years in Tripura.

Table No.3.

	1972-73				1973-74			
	No. of Houses.	Houses sprayed.	Houses missed.	Perc-centage	No. of Houses.	Houses sprayed.	Houses missed.	Perce-ntage.
Tripura.	3,14,608	154419	160189	50'9	314608	201342	113265	36'0

The above table indicates the coverage of spraying operation during the years under review. It is noticed that in these two years 50'9% houses/structures were left uncovered by the spraying squads. It means that a large area of the state was not covered by spraying operation and to that extent transmission possibility may remain in that areas. This is a vital point and care should be taken to cover the whole area, otherwise, it will defeat the very objective of the programme.

A glance at the coverage of the programme in the selected sub-divisions also reveals the same dismal picture, for instance, during 1972-73 percentage of areas uncovered by the spraying squads were 49'6, 57'6, 36'7 and 34'4 respectively in Khowai, Kailashahar, Sonamura and Belonia. However, the year 1973-74 marked an improvement in this respect in the selected sub-divisions as the following table indicates.

Table No.4.

	1972-73			1973-74				
	No. of houses/ structure	Houses sprayed.	Houses missed.	Perce- ntage	No. of houses/ structure	Houses sprayed	Houses missed	Perce- ntage.
Knowai.	29769	13810	14776	49'6	29769	18959	3731	12'53
Kailashahar.	28881	12958	16635	57'6	28881	19995	3762	13'03
Sonamura.	20377	13099	7003	36'7	20377	17257	391	1'92
Belonia.	30241	18694	11087	34'4	30249	21277	4798	15'86

Surveillance Activities:

Surveillance operation plays an important role in the implementation of the National Malaria Eradication Programme. Surveillance worker who remains in the villages performs the most important job in the form of collecting blood slides from all fever cases. He sends all the collected slides to the Laboratory for examination. The following table indicates number of cases of blood smears collected, number of cases of blood smears examined and number of positive cases radically treated in 1971-72, 1972-73 and 1973-74 in Tripura.

Table No.5.

Year.	Blood smears collected.	Blood Examined.	No. of posi- tive cases.	No. of Radically treated.
1971-72.	1,23,002	102607 (83'42)	2,772	2058 (74'24)
1972-73.	1,06,331	88928 (83'64)	6,579	6431 (97'75)
1973-74.	1,18,632	90779 (76'52)	5,171	4800 (93'00)

From the above table it is noticed that the performance in the laboratory services was very poor. There was usually a backlog of slides which would prevent timely administration of radical treatment. For example, the total backlog of unexamined slides for the year 1971-72 was 16'58% whereas it was 16'36% in 1972-73 and 25'48% in 1973-74. This indicates that the ~~prashikshita~~ performance of laboratory is not satisfactory.

It is reported that there are 9 microscopists under this programme and every microscopist can examine 50 blood-slides per day. This means 450 blood-slides can be examined per day in the laboratory. If we assume 260 working days in a year then a number of 1,17,000 blood-slides would be examined in a year as per norm of workload. But the relevant figures in the table fall far short of it. Again, it is seen that many of the positive cases found in different years have not been radically treated. This points out a serious lacuna existing in the implementation of the programme.

The position regarding the blood-smears collected, examined, positive cases and radical treatment given is also not very encouraging in the selected sub-divisions viz Khowai, Kailashakar, ~~Samra Samra~~ Sonamura and Belonia as is evident from the following table.

## Surveillance activities made in the selected Sub-divisions.

Table No.6.

	No. of blood smears collected			Blood smears examined			No. found positive			No. given Radical treatment		
	1971-72	1972-73	1973-74	1971-72	1972-73	1973-74	1971-72	1972-73	1973-74	1971-72	1972-73	1973-74
Khowai.	12130	11032	15645	10101 (83'27)	8215 (74'47)	10412 (66'55)	463	760	820	374 (80'78)	739 (97'24)	791 (96'46)
Kailashahar.	12680	6565	9153	10544 (83'15)	4520 (68'85)	6781 (74'08)	488	204	71	258 (52'87)	191 (93'63)	69 (97'18)
Sonamura.	10109	9105	10053	8810 (66'38)	8049 (88'40)	5460 (54'31)	43	104	170	43 (100'00)	95 (91'35)	170 (100'00)
Belonia.	10339	11550	10246	7232 (69'95)	10350 (89'61)	10246 (100'00)	252	1122	708	205 (81'35)	1112 (99'12)	641 (90'54)

It is seen from the above table that in all the years from 1971-72 to 1973-74, a large number of blood smears collected were left unexamined. Only in 1973-74 and that also in one sub-division viz Belonia that we find that the number of cases of blood smears collected tallied with the cases of blood smears examined. The poorest performance in regard to this matter was made by the sub-divisional unit in Sonamura in 1973-74 where as many as 45'69% of blood smears collected were left unexamined. This finding at the sub-divisional level corroborates our conclusion regarding existence of lacuna in the implementation of the programme made earlier.

As regards the treatment of positive cases it may be stated here that the number of cases given radical treatment indicates a dismal picture in all the sub-divisions except Sonamura during 1971-72. The position of cases given radical treatment should an improvement in the subsequent years except a slight decrease in Sonamura in the year 1972-73 and in Belonia in 1973-74.

Performance of the National Malaria Eradication Programme in the selected villages:

We selected 60 villages in four sub-divisions of Tripura. Our field staff visited each of these villages during May and June ( up to 9th June), 1974 and held discussion with the Malaria Inspectors, Surveillance Inspectors and also with the selected respondents. Findings of the these meetings which constitute the basis of our report, are enumerated below.

Spraying Operation:

Table No. 7 indicates the number of selected villages sprayed and also number of selected villages left uncovered for the period from 1971-72 to 1973-74. It is seen from the table that selected villages of Sonamura sub-division were all covered by the operation in all the years referred to.

Performance of the spraying programme in the selected villages.

Table No.7.

Sl. No.	Name of the sub-Unit.	Total No. of selected villages.	No. of sprayed villages during 1971-72	No. of sprayed villages during 1972-73	No. of sprayed villages during 1973-74	No. of villages not sprayed during 1971-72	No. of villages not sprayed during 1972-73	No. of villages not sprayed during 1973-74	R M Ks.
1	2	3	4	5	6	7	8	9	10
1.	Khowai.	16	10 (62'50%)	16 (100'00%)	10 (62'50%)	6 (37'50%)	Nil	6 (37'50%)	
2.	Kailashahar.	24	Nil (8'33%)	2 (100'00%)	24 (100'00%)	Nil	22 (91'67%)	Nil	
3.	Sonamura.	6	6 (100'00%)	6 (100'00%)	6 (100'00%)	Nil	Nil	Nil	
4.	Belonia.	14	3 (21'43%)	4 (28'57%)	4 (28'57%)	11 (78'57%)	10 (71'43%)	10 (71'43%)	

Performance in the selected villages, Belonia sub-division was the poorest of all where as many as 78'57% of villages were left uncovered by the spraying squads in 1971-72 and even in the subsequent years no appreciable improvement was marked. Spraying performance in Khowai and Kailashahar sub-divisions during this period was also not upto the mark.

Performance of the spraying operation on the date of investigation.

Table No.8.

Sl. No.	Name of the sub-Unit.	No. of selected villages.	No. of selected villages sprayed on the date of investigation.	No. of selected villages remained to be sprayed (on the date of investigation.	R M Ks.
1.	Khowai.	16	10 (62'50%)	6 (37'50%)	
2.	Kailashahar.	24	Nil	24 (100'00%)	
3.	Sonamura.	6	Nil	24 (100'00%)	
4.	Belonia.	14	Nil	14 (100'00%)	

The above table indicates number of villages found sprayed on the date of investigation ( 4th May to 9th June, 1974) which was carefully selected at the end of prescribed spraying season in accordance with the logistic of spraying. It is reported that only 10 villages out of 16 in Khowai sub-division were found sprayed on the date of investigation. Number of villages found sprayed on the date of investigation in the remaining selected sub-divisions was nil. This shows that logistic of spraying is not properly adhered to in course of operation. This matter calls for urgent attention.

Estimated number of total structures, structures sprayed, not sprayed and structures refused/locked in the selected villages.

Table No.9.

Sub-Divisions.	No. of select- ed vill- ages.	Total No. of structures during.		Total No. of structures sprayed during.		Structures not sprayed during.		Structures refused/locked.	
		1972-73	1973-74	1972-73	1973-74	72-73	73-74	72-73	73-74
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Khowai.	16	2665	2665	1936	866	729	1799	92	76
						(27'35)	(67'50)	(12'62)	(4'22)
Kailashahar.	24	1931	1931	109	1063	1822	868	85	168
						(94'36)	(44'95)	(4'67)	(19'35)
Sonamura.	6	2567	2595	1963	2102	604	493	192	402
						(23'53)	(19'00)	(31'79)	(81'54)
Belonia.	14	1555	1427	645	834	910	593	231	501
						(58'52)	(41'56)	(25'38)	(84'49)

Table No.9 shows that the estimated number of structures in our sample villages, No. of structures sprayed, No. of ~~XXXXXXXXXX~~ structures not sprayed including the number of structure where spraying could not be conducted owing to refusal or absence of the residents.



It is seen from the table that in 1972-73, number of structures uncovered by spraying operation varied from 23'50% in Sonamura sub-division to 94'36% in Kailashahar. In 1973-74, the number of uncovered structures varied between 19% in Sonamura to 67'50% in Khowai. As per logistic of spraying, spraying operation is scheduled to be conducted during March to May and second round goes from August to November in every year. The National Malaria Eradication Programme is functioning in Tripura with the object to afford complete coverage by residual spraying with insecticide in all human habitations and cattle sheds etc.. During the aforesaid months as per provision of the programme spraying squads were to visit all the villages for spraying operation. We have collected the data from our selected villages in order to know the number of households sprayed during 1971-72 to 1973-74 and presented the data in the following table.

Table No. 10.

Number of households sprayed in the selected sub-units during 1971-72 to 1973-74.

Sub-Divisions.	Total No. of selected villages.	No. of households	Number of households sprayed during.		
			1971-72	1972-73	1973-74
(1)	(2)	(3)	(4)	(5)	(6)
Khowai.	16	875	N.A.	399 (45'60)	364 (41'60)
Kailashahar.	24	775	N.A.	196 (25'26)	664 (85'57)
Sonamura.	6	1137	1134 (99'7%)	1134 (99'7%)	1131 (99'5%)
Belonia.	14	754	316 (41'91)	325 (43'10)	502 (66'58)

The above table indicates the number of households sprayed during 1971-72 to 1973-74. Performance of spraying in the households under Sonamura sub-division (sub-division) was satisfactory while the performance of Belonia sub-division is not very encouraging. As regards Khowai and Kailashahar sub-divisions no information regarding the households sprayed during 1971-72 was available. The situation has improved to some extent in Khowai, Kailashahar and Belonia sub-divisions in the year 1973-74 and the performance of spraying at Sonamura sub-division was satisfactory as before.

Surveillance activities was started in Tripura in the year 1966. The entire unit has been divided into 64 Sectors and 259 Sections. One Surveillance worker has been put as basic worker in each section. Surveillance worker is to visit each and every house in every fortnight in order to enquire into fever cases. Generally 2000 houses with a population of 10,000 are under the jurisdiction of one Surveillance worker. He is to put question to the villagers regarding history of fever cases and to collect blood smear and offer presumptive treatment as per scheduled doses and put his dated initial in the house card or house-stencil as a token of the performance of his duty.

In order to supervise or watch the activities of the Surveillance worker there is inspecting staff to supervise the activities of the Surveillance worker. We have collected data from the selected villages in order to know the number of visit made by the inspecting staff from 1971-72 to 1973-74 and these are presented in the table below.

Table No.11.

Sl. No.	Name of the Sub-Divisions.	Total No. of selected villages.	No. of selected villages visited by the Surveillance worker during			No. of selected villages visited by the Inspecting authority during								
			1971-72 P.C.	1972-73 P.C.	1973-74 P.C.	1971-72 P.C.	1972-73 P.C.	1973-74 P.C.						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.	Khowai.	16	10	62'5	10	62'5	16	100%	10	62'5	10	62'5	15	93'7
2.	Kailashahar.	24	1	4'2	1	4'2	8	33'3	N.A.	-	N.A.	-6	15	62'5
3.	Sonamura.	6	1	16'7	1	16'7	1	16'7	N.A.	-	N.A.	-	N.A.	-
4.	Belonia.	14	14	100%	14	100%	14	100%	10	71'4	10	71'4	10	71'4
Total:-		60	26	-	26	-	49	-	20	-	20	-	40	-

Table No.11 indicates that number of villages visited by the Surveillance Worker was very poor in two sub-divisions viz Kailashahar and Sonamura where only 4'2% and 16'7% of the selected ~~xx~~ villages respectively were covered by visit in 1971-72. The coverage by visit was satisfactory in Belonia and moderately

satisfactory in Khowai in that year. Some improvement was, however, made in respect of visit by the Surveillance worker in 1973-74 in Khowai, Kailashahar. But Sonamura recorded no progress in the matter while the situation in Belonia was as satisfactory as before.

As regards the visits made by the Inspecting staff the coverage was more or less satisfactory (for Sonamura, no relevant information was available). But it appears that visit by the Inspecting staff produced no effective result in streamlining the work of supervision at surveillance work level.

Table No.12.

Sl. No.	Name of the Sub-Unit.	No. of selected villages.	Total blood smears collected.			No. of blood smears examined.			Positive cases			No. of cases radi-cally treated.		
			1971-72	72-73	73-74	71-72	72-73	73-74	71-72	72-73	73-74	71-72	72-73	73-74
1	C	3	4	5	6	7	8	9	10	11	12	13	14	15
1.	Khowai.	16	271	327	302	267	326	296	14	8	13	14	8	13
						(98'52)	(99'69)	(98'01)	(5'24)	(2'45)	(4'39)			
2.	Kailashahar.	24	95	524	339	94	507	339	38	10	5	38	10	5
						(98'95)	(96'76)	(100'00)	(40'43)	(1'98)	(1'47)			
3.	Sonamura.	6	621	7	nil	591	6*	nil	8	6	nil	8	6	nil
						(95'17)	(85'71)		(1'35)	(100'00)				
4.	Belonia.	14	55	222	131	50	206	131	6	16	11	6	16	11
						(90'91)	(92'79)	(100'00)	(12'00)	(7'77)	(8'40)			

Contd.....P-25.

Ex

Table No. 12 indicates number of blood smears collected, number of blood smears examined, number of positive cases and number of cases radically treated in our selected villages. It is observed that in all the years under review, more than 90% of blood smears collected were examined in all the sub-divisions except in Sonamura in 1972-73. Similarly almost all the positive cases of malaria detected were found to be radically treated.

An assessment of efficiency of spraying operation-respondent-views:

For on the spot verification of coverage and effectiveness of spraying operation 889 households were selected for interview in 60 villages.

Information collected by the field staff from the respondents is analysed in the following paragraphs.

Awareness of the respondents regarding the objective of D.D.T. spraying:

People's co-operation and awareness is the essential precondition on success of any welfare programme effective large section of our population. Table No.13 indicates the number respondents who are fully aware of the objective of D.D.T. spraying.

Table No. 13.

No. of respondents fully aware of D.D.T. spraying.

Sl. No.	Name of the Sub-Unit.	No. of villages.	Total No. of respondents	Persons fully aware of the objective of D.D.T. spraying.	Percentage.
(1)	(2)	(3)	(4)	(5)	(6)
1.	Khowai.	16	216	209	96'76
2.	Kaflashahar.	24	193	192	99'43
3.	Sonamura.	6	289	288	99'65
4.	Belonia.	14	191	191	100'00
Total :-		60	889	880	-

It is observed from the table that out of the total number of 889 respondents, 880 are aware of the objective of D.D.T. spraying. This shows that excepting few almost all the respondents know the purpose for which spraying operation is carried.

Table No.14

Coverage of spraying operation in the selected households.

Sl. No.	Name of the Sub-Unit.	No. of rounds visited by the spraying squad during			No. of structures covered during			No. of structures refused during			Total	
		1971-72	1972-73	1973-74	1971-72	1972-73	1973-74	1971-72	1972-73	1973-74		
1	2	3	4	5	6	7	8	9	10	11	12	13
1.	Khawai.	16	1	1	1	249	25 247	441	57	62	97	216
2.	Kailashahar.	24	1	1	1	239	278	346	2	7	12	21
3.	Sonamura.	6	2	2	2	692	679	691	10	16	13	39
4.	Belonia.	14	1	1	1	266	274	322	4	9	35	48

Respondents were questioned regarding the coverage of spraying operation during three years viz. 1971-72, 1972-73, 1973-74 in their houses/structures. Generally spraying operation is to be carried in two rounds in a year. But it is seen from the table number 14 that except in Sonamura sub-division only one round of spraying was performed. The table indicates a number of cases in which spraying was refused such cases being maximum in Khawai sub-division and minimum in Kailashahar sub-division.

Contd.....P-26

Thus it is observed that ~~xxx~~ though people in general are aware of the objective of D.D.T. spraying they often refuse it on various grounds.

Reasons for refusal of D.D.T. spraying:

Reasons for refusal of spraying as gathered from the respondents are presented in the table No.15. It is seen from the table that difficulties in removal of utensils from the Kitchen constitute the main cause of refusal of spraying in all sub-divisions except Sonamura. In Sonamura sub-division this difficulty appears to be minimum. Difficulties in removing the articles from the bed-room appears to be second important reason for refusal of spraying. Spraying was also refused in a substantial number of structures because the respondents did not like to allow D.D.T. spraying in the store-room where food grains etc. are preserved. Among other reasons is the fact that spraying is refused in harvesting time as most of the members remain engaged in the field and that there is an idea among some residents that spraying is not effective in eradication of mosquitos.

Table No.15  
No. of respondents refused D.D.T. spraying during 1971-72 to 1973-74.

Name of Sub-Unit.	Total structures refused.	Reasons for refusal			
		Reason-1	Reason-2.	Reason-3	Others-4
Khowai.	216	111(51'38)	9(4'18)	21(9'72)	75(34'72)
Kailashahar.	21	9(42'86)	6(28'57)	-	6(28'57)
Sonamura.	39	3(7'69)	9(23'08)	6(15'38)	21(53'85)
Belonia.	48	24(50'00)	-	6(12'50)	18(37'50)

Contd.....P-29.



Views of the respondents regarding quality of spraying:

Though the respondents are not supposed to be aware of the prescribed formula for diluting D.D.T. powders, commonsense view of them regarding quality of spraying was sought and is analysed in Table No.16.

Table No.16.

Sl. No.	Name of the Sub-Unit.	Total No. of villages.	Total No. of respondents.	Views of the respondents.					
				Good	P.C. (%)	Average	P.C. (%)	Not satisfactory	P.C. (%)
1	2	3	4	5	6	7	8	9	10
1.	Khowai.	16	216	97	44'9	113	52'3	2	00'9
2.	Kailashahar.	24	193	127	65'8	51	26'4	5	02'6
3.	Sonamura.	6	289	277	95'9	9	03'1	-	-
4.	Belonia.	14	191	59	30'9	64	33'5	6	03'1

It is reported that majority of respondents are satisfied regarding quality of spraying. Only a few of the respondents ranging between 0'9 to 3'1% are of the view that the quality of spraying is not satisfactory.

Incidence of fever:

Incidence of fever is an important indicator of success of National Malaria Eradication Programme. We have made an attempt to assess the incidence of Malaria from the spot verification and information received from the respondent households. Generally, each Surveillance Worker has to collect blood smears in all cases of fever for detecting Malaria parasite. Reports from the respondents show an increasing number of fever cases in all sub-divisions from 1971-72, 1972-73, and 1973-74.

But number of patients having their blood examined fall far short of the total number of fever cases in all the years in all sub-divisions. For example, in 1971-72 number of blood slides examined in Khowai, Sonamura, Kailashahar and Belonia are respectively 39, 22, 26 and 29 only against total number of fever cases numbering 173, 310, 353 and 296. Some improvement in the matter, however, observed in 1973-74.

Table No. 17.

Total number of fever cases of the selected household members as reported by respondent.

Name of Sub-Unit.	Type of disease			No. of patients examined blood.			No. of patients suspected malaria.			No. of patients who died of malaria.		
	Fever.			1971-72			1971-72			1971-72		
	1971-72	72-73	73-74	1971-72	72-73	73-74	1971-72	1972-73	1973-74	1971-72	1972-73	1973-74
Khowai.	178	250	307	39	47	131	35	16	105	2	nil	3
Kailashahar.	353	435	468	26	56	171	221	311	321	nil	3	5
Sonamura.	310	396	426	22	137	210	25	141	216	nil	nil	nil
Belonia.	296	317	392	29	40	96	10	14	133	nil	nil	nil.

Contd.....P-31.

No. of Malaria cases found on the date of investigation:

Table No. 18 indicates number of malaria cases found during investigation. It is seen from the table that number of villages effected by malaria was 3,5,8 and 1 in Khowai, Sonamura, Kailashahar and Belonia sub-divisions respectively. Of the selected sub-divisions maximum cases of malaria are found in Kailashahar (16) and Sonamura (13).

Table No.18.

Number of Malaria cases found on the date of investigation.

<u>Sl. No.</u>	<u>Name of Sub-Unit.</u>	<u>Total No. of villages.</u>	<u>No. of villages where malaria has been detected.</u>	<u>No. of cases of malaria found.</u>
<u>(1)</u>	<u>(2)</u>	<u>(3)</u>	<u>(4)</u>	<u>(5)</u>
1.	Khowai.	16	3	3
2.	Kailashahar.	24	8	16
3.	Sonamura.	6	5	13
4.	Belonia.	14	1	1
<u>Total :-</u>		<u>60</u>	<u>17</u>	<u>33</u>

Views of the respondents regarding the National Malaria Eradication Programme:

We sought the views and suggestions from the respondents regarding (1) D.D.T. spraying and (11) surveillance activities. These are incorporated in Table No.19. It is seen from the table that bulk of the respondents expressing views emphasised the need for increasing the funds of spraying operation. Second, in importance to the respondent is the need for timely and intensive spraying.

Regarding surveillance work also the respondents are in favour of increasing actual number of visit by the workers. Attention was also drawn by the respondents to the need for timely visit. A section of the respondents pointed that the result of blood examination should be communicated to the families of the patients as early as possible.

Views of the respondents regarding the side benefits of D.D.T. spraying and also adverse effect of spraying were sought. A large number of respondents in Sonamura and Kailashahar reported that spraying helped control of bugs, cockroaches, white ants and other insects. ~~xMax~~ No particular adverse effect, however, was mentioned by the respondents.

Contd.....P-33..

Table No.19

Views and suggestions of the respondents regarding National Malaria Eradication Programme.

Sl. No.	Name of the Sub-Unit	Views and suggestions about.												
		D.D.T. spraying.				Surveillance work				Side effects of spraying.				
		Spraying should be timely & intensive operation should be increased.	No. of rounds of spraying.	Spraying should be effective.	Off-views	Others.	Surveillance Worker should visit to household time-ly.	No. of visits should be increased.	Result of blood collection should be communicated immediately.	Off-views	Others.	Spraying kills bugs & insects.	No bad affect of D.D.T. spraying noticed.	Offered no views.
1.	Khowai	21	38	0	143	14	4	7	22	183	0	35	1	180
2.	Kailashahar.	31	146	6	9	1	31	123	15	14	10	124	7	62
3.	Sonamura.	22	31	148	88	0	5	60	99	94	31	211	0	78
4.	Belonia.	28	75	78	6	4	6	3	128	13	41	108	83	nil.

Contd.....P-34.

Surveillance work - progress in radical treatment.

In addition to collection of data regarding incidence of fever, it is the duty of the surveillance staff to arrange for the examination of blood and radical treatment. Number of fever cases detected, number of blood smears collected, number of malaria cases radically treated for different periods are put in table Number 20. It is seen that during the last year in majority of fever cases detected, blood smears were collected. But there is some shortfall in treatment of malaria cases found. For example, - during the last year only 14 out of 20 malaria cases in Kailashahar sub-division and 10 out of 13 malaria cases in Khowai sub-division were radically treated. Care should be taken to minimise the gap between actual number of cases of malaria and number of cases in which treatment is rendered.

Table No.20.

Progress in radical treatment.

Name of the Sub-Unit.	Period.	No. of fever cases detected.	No. of blood smear collected.	No. of malaria cases found.	No. of cases radically treated.
1	2	3	4	5	6
Khowai.	Current Fortnight.	4	4	nil	nil
	Last Fortnight.	2	2	nil	nil
	Last Month.	1	4	nil	nil
	Last Year.	149	110	13	10
Kailashahar.	Current Fortnight.	2	1	nil	nil
	Last Fortnight.	1	nil	nil	nil
	Last Month.	2	3	1	1
	Last Year.	156	151	20	14
Sonamura.	Current Fortnight.	1	nil	nil	nil
	Last Fortnight.	nil	nil	nil	nil
	Last Month.	nil	nil	nil	nil
	Last Year.	210	210	3	2
Belonia.	Current Fortnight.	1	nil	nil	nil
	Last Fortnight.	nil	nil	nil	nil
	Last Month.	nil	4	nil	nil
	Last Year.	99	99	17	16

SEXEXSurveillance activities in the selected households.

The Surveillance work is the main pillar of this programme. One Surveillance Worker is posted in each section. He will be responsible for surveillance work in about 2000 houses having about 10,000 population. But these norms vary in difficult areas. He will visit each household in his area once in a fortnight and record all necessary data. He will collect blood smears for all fever cases in the households at the time of his visit as well as from any fever cases since his last visit.

He will also put his dated initial in the housecards/house ~~xxxxxx~~ stencil as a token of visit. He will administer a single dose treatment with 4 aminequi-line drug to all fever cases after collection of the ~~xx~~ blood smears.

Radical treatment is also offered to the positive cases. We have collected the data regarding the number of visits made by the Surveillance Worker in our selected households in current fortnight, last fortnight and last month on the basis of the norm that the Surveillance Worker is to visit one household in every fortnight for the reason mentioned above. The following table indicates the distribution of approaches made by the Surveillance Worker to the selected households in current fortnight, last fortnight and last month.

Table No.21.

Sub-Division.	Total No. of respondent.	Distribution of approaches made by the Surveillance Worker to the Respondent households.			Actual total No. of visits to the households.	Percentage of actual No. of visits to the normal No. of visits.
		No. of norm of visits to the households.	Period.	No. of visits to the households.		
(1)	(2)	(3)	(4)	(5)	(6)	
Khowai.	216	216	C.F.	46	21'30	
	<del>216</del>	216	L.F.	77	35'65	
		432	L.M.	154	35'65	
Kaxkxkxkxkxkx Sonamura.	289	289	C.F.	159	55'02	
		289	L.F.	195	67'47	
		578	L.M.	243	42'04	
Kailashahar.	193	193	C.F.	11	5'70	
		193	L.F.	13	6'74	
		386	L.M.	24	6'22	
Belonia.	191	191	C.F.	87	45'55	
		191	L.F.	67	35'08	
		382	L.M.	108	28'27	

Contd.....P-37.



From the above table it is observed that number of visits of the Surveillance Workers in the selected households is not at all satisfactory as the Surveillance Workers do not visit the households as per norm. From the above table it is also seen that number of visits made by the Surveillance Workers in the selected households of Kailashahar sub-division reveals a dismal picture. Number of visits made by the surveillance workers in the remaining sub-divisions namely, Khowai, Belonia and Sonamura are also not satisfactory in accordance with the norms. From the field visit it is also observed that the surveillance workers are mostly irregular in their visit. House-cards and house-stencils, if any, are not properly dated exposing irregular visit from the side of surveillance workers. It is also revealed from the table number 21 that low number of collection of blood smears are the result of irregular visits.

Problems of implementation of the programme at different levels.

Tripura with an area of 10,477 sq. kms. is surrounded on three sides by Bangladesh and only one road-link connects Tripura with the District of Cachar( Assam ). Tripura is surrounded by hills and dales and only 2/3 area of it is on plain land with a population of 15,56,342 as per 1971 Census. Transport and communication facilities are still in developing stage. As a result, the ~~Nam~~ National Malaria Eradication Programme can not cover the whole state. Transport difficulties of the unit also stands in the way of proper implementation of the programme throughout the State. The existing condition of the departmental vehicles is also not good and their services are not fully utilised by the Department.

Transport bottleneck makes it difficult to send men and materials to ~~the~~ different sub-units. It is learnt that the Annual requirements and ~~the~~ consumption of D.D.T. in Tripura for the year 1971-72 to 1973-74 are given below.

<u>YEAR.</u>	<u>REQUIREMENTS</u>	<u>CONSUMPTION</u>
1971-72.	273,000 Lbs 75% W.D.P.	1st Round - 55,297 Lbs <u>2nd Round - nil</u> Total. 55,297 Lbs
1972-73.	3,00,000 Lbs 75% W.D.P.	1st Round - 53,566 Lbs <u>2nd Round - 72,341 Lbs</u> Total:- 1,25,907 Lbs
1973-74.	3,00,000 Lbs 75% W.D.P.	1st Round - 67,693 Lbs <u>2nd Round - 1,20,296 Lbs</u> Total:- 1,87,989 Lbs.

From the above ~~table~~ figure of consumption of D.D.T. in different years it seems that many areas of the State remain unsprayed. The present spraying squads can not cope with the increasing number of population of the state. As per norm it is learnt that one pump is to cover 20 households per day. But in case of Tripura it may not be possible to maintain such a norm. For example at Khowai, 12-20 households were sprayed per pump per day and in Belonia and Sonamura it is 15-20 households per pump per day. It is also reported that storing difficulties and non-availability of machine at the time of spraying also stand in the way of effective spraying. Malaria Inspectors are reported to be overburdened with duties of diverse nature. They are to supervise spraying squads, surveillance works, and other official business. So they desire to have an office staff for prompt disposal of works. Again, present system of appointment of workers is also not encouraging.

They are engaged on daily rate basis for the operational period. But they have to move from one place to another for operation without any T.A.. As a result the workers are reported to be not satisfied with their present job and their total output per day may not be satisfactory.

Laboratory Service:

One of the main defects in the surveillance operation is poor performance by the laboratory services. There is usually a backlog of slides which would prevent timely administration of radical treatment. For example, the total backlog of un-examined slides for the years 1971-72, 1972-73 and 1973-74 in Tripura was 16'58%, 16'36% and 25'48% respectively which will be evident from the table No.5. The laboratory services should be reviewed with the object of securing improvement in the methods of transport of slides from the field to laboratory and in the staining method and the microscope should be inspected and replaced where necessary. Attention should also be paid to the supervision, training and retaining of microscopists etc. Prompt examination and expeditious relaying of examination would help in early improvement of radical treatment to malaria positive cases and help in undertaking remedial measures like mass survey, focal spray etc. which are effective weapons to combat the problems.

Surveillance activities:

Surveillance works were started in the year 1966 and the staff strength of the surveillance workers is not in a position to keep pace with the increasing number of population.

The staff strength of the Surveillance Workers should be increased proportionately with the increasing trend of population. During field survey it was learnt that the Surveillance Workers did not approach each and every household in a fortnight under their jurisdiction. As a result many households were left unattended. In course of field survey it was learnt that medicines were not supplied to the Surveillance Workers sufficiently and timely. They also reported that the present workload of each Surveillance worker is heavy and for that reason they can not visit each and every house as per norm. Again, some posts of Surveillance Inspectors are lying vacant in different sectors of the State. Another important factor is that there are also some posts of surveillance workers which are still lying vacant and the services of these basic workers were not available in different areas of the state. Besides other technical difficulties, all these difficulties and problems require immediate solution for proper functioning of the programme. Difficulties faced by the Surveillance Inspector and Malaria Inspectors of each selected Sub-Division regarding proper implementation of the Scheme are summarised in appendix No.3.

Contd.....2-41.

Conclusions:

1. Insecticidal coverage:-

- i). Residual insecticidal total coverage both qualitative and quantitative by two rounds of spray as per logistic of spraying will require to be achieved to cut down transmission of malaria parasites which is so essential to reach the desired goal of Malaria Eradication.
- ii). The present spraying squads are quite insufficient in view of the increased population and number of structures. So it is desirable to increase the number of spraying squads for covering the whole State.
- iii). During spraying operations mechanics and spare parts should be available to all sectors so that spraying work may not suffer at the time of spraying.
- iv). Proper propaganda should be made to the villagers in order to minimise the number of refusal of households in the hilly areas.
- v). Supervision at all levels be geared up to have proper output per pump per day and uniform total coverage. Output per pump per day has come down to a considerable extent from the standard resulting in loss of manpower. Spraying squads require suitable augmentation to have complete coverage.

2. Surveillance activities:

- i). It is reported that the present workload of the Surveillance workers is heavy. The number of posts of the Surveillance workers was not increased in accordance with the increased population. So the number of posts of the surveillance workers should be increased.

ii). Vacant posts of the surveillance workers should be filled up early in order to strengthen the surveillance activities so also the posts of the surveillance Inspectors.

iii). House-cards/House-stencils be placed in each and every house. Surveillance workers should put dated initial on finishing his job in each house and Surveillance Inspectors and member of other supervising staff should put their dated initial on finishing <sup>their</sup> his supervision in redated columns.

iv). Domiciliary visit in each and every house by the surveillance workers as per programme be ensured so that no fever cases be left without collection of blood smears.

v). Drugs are not readily ~~xxx~~ available at the time of presumptive doses in many cases. So the surveillance workers do not visit regularly. Hence regular supply of drugs is desirable.

vi). Surveillance workers should despatch slides twice in a week to cut down time-lag between collection and sending of blood smears in the laboratory. The patients also desire to have their blood examination report as early as possible.

vii). Surveillance Inspectors should gear up their field visit and radical treatment to all positive cases should be undertaken on having reports from the Laboratory without killing further time.

viii). Stray cases of malaria were found in the selected villages (Table No.18). So surveillance activities must be ~~gx~~ geared up in order to maintain the norm of visit in every household.

3. Laboratory Services:

Normal output per day per technician be maintained. Total blood smears collected annually and the number of microscope in action by the technicians and surveillance Inspectors trained in microscopy and posted in malaria laboratory, do not justify backlog of slides remaining un-examined. Timely examination and timely despatch of results should be ensured.

4. Every Malaria Inspector of our selected sub-divisions is of the ~~my~~ opinion of having a car for smooth and speedy work in different areas of the sub-unit.

5. Pay and allowances of the field staff should be disbursed timely.

6. It is reported that proper implementation of the Scheme has been handicapped by financial limitations. For more vigorous activities under the programme against malaria, financial outlay is required to be enhanced.

7. The programme is still in Attack Phase in the State. Though started in 1958 it has not yet reached either consolidation or Maintenance Phase. It appears that the Programme has failed to make rapid strides in the State.

A P P E N D I X No. -1.

Unit( Hd.Quarters) Agartala.

Zones ( 4 Nos.)

<u>Zone- A</u>		<u>Zone - B.</u>			<u>Zone -C</u>		<u>Zone - D</u>		
Kailashahar		Teliamura.			Agartala		Udaipur.		
<u>Sub-Unit</u>		<u>Sub-Unit.</u>			<u>Sub-Unit.</u>		<u>Sub-Unit.</u>		
Dhanmanagar.	Kailashahar.	Kamalpur.	Khowai.	Amarpur.	Agartala.	Senamura.	<u>Sub-Unit.</u>		
Sector -7	Sector - 5	Sector-4	Sector-5	Sector-7	Sector-16	Sector-4	Udaipur.	Belonia.	Sabroom.
Section-27	Section-22.	Section-17	Section-24	Section-27	Section-66	Section-16	Sector-4	Sector-7	Sector-4
							Section-18, Section-27 Section-15		

Contd.....P-45



## APPENDIX No.2.

STAFFING PATTERN OF THE NATIONAL MALARIA ERADICATION PROGRAMME UNIT  
IN TRIPURA ( 1974-75 )

Name of Sub-Unit/Section	Categories of posts.	Total No.	Categories of post vacant.	Total No.	Pay scale.	Nature of duties.	Duties and functions of M.O.
1	2	3	4	5	6	7	8
1. Malaria Officer		1	-	-	Rs.450-1250/-		
2. Entomologist.		1	-	-	Rs.300-900/-		
3. Assistant Unit Officer.		4	1	1	Rs.200-400/-		
4. Accountant.		1	-	-	Rs.200-300/-		
5. Lower Division Clerk.		2	-	-	Rs.125-200/-		
6. Senior Malaria Inspector.		3	1	1	Rs.130-160/- (Pre-revised)		
7. Malaria Inspector.		7	-	-	Rs.125-200/- (With higher start at Rs.164/-)		
8. Laboratory Technician.		12	3	3	-do- <del>125</del>		
9. Surveillance Inspector.		66	2	2	-do-		
10. Surveillance Worker.		264	14	14	Rs.100-140/-		
11. Mechanic.		1	-	-	Rs.140-210/-		
KX.							

Contd...P-46.

Contd....Appendix No.2.

Name of Sub-Unit/Section	Categories of posts.	Total No.	Categories of posts vacant.	Total No.	Pay scale.	Nature of duties.	Duties and functions of M.O.
1	2	3	4	5	6	7	8
12. Driver Grade-I & II.		11	5	5	Rs.140-210/- (4 Drivers) Rs.100-140/- (7 Drivers)		
13. G.D.A.(Cleaner).		5	3	3	Rs.60-75/-		
14. Superior Field Worker(12 months)-		4	1	1	Rs.25/-fixed plus ad-hoc interim increase for Rs.10/-		
15. Field Worker (12 months.)		10	-	-	Rs.60-75/-		
16. Peon.		4	1	1	Rs.60-75/-		
17. Chowkider.		1	-	-	Rs.60-75/-		
18. Sweener.		1	-	-	Rs.60-75/-		
19. Mate.		44	(Engaged during spraying.)	@ Rs.6'20 per day	for Mate.		
20. Labourers.		230	-do-	@ Rs.5'50 per day	for labourer.		

Contd.....E-47.

A P P E N D I X No.3.

Views and suggestion of Surveillance Inspector and Malaria Inspector  
in selected Sub-Divisions.

Sub-Division.	Views of & suggestions of Surveillance Inspector.	Views and suggestions of Malaria Inspector.
Khowai.	1. No. of Surveillance should be increased as their work-load is heavy.	1. Inadequate spraying staff for covering the whole Sub-Division. 2. Proper propaganda should be made for popularising the scheme.
Kailashahar.	1. No. of section must be increased in order to lessen the workload of Surveillance Worker.	1. No. of spraying squad must be increased. 2. One car is required for inspection and supply of articles etc. 3. Work-load of Malaria Inspector is heavy. 4. One staff is needed by Malaria Inspector.
Sonamura.	1. No. of Surveillance worker should be increased as their work-load is heavy.	1. One car is required during spraying time. 2. One whole time staff is required for maintaining office and spraying pumps etc.
Belonia.	1. Sufficient drugs are not available. 2. No. of Surveillance worker should be increased as their work-load is heavy. 3. Spraying not properly done for want of implements.	1. Staff strength should be increased at the time of spraying operation. 2. One Mechanic is required. 3. Spraying staff should be trained. 4. One car is required.

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