

**PUBLIC ACCOUNTS COMMITTEE
(1969-70)**

(FOURTH LOK SABHA)

HUNDRED AND FIRST REPORT

**[Paragraph 107 of Audit Report (Civil), 1969 relating
to National Malaria Eradication Programme (Minis-
try of Health, Family Planning, Works, Housing &
Urban Development—Department of Health)]**

**LOK SABHA SECRETARIAT
NEW DELHI**

January, 1970/Magha, 1891 (Saka)

Price 1 Rs. 1.10

336.3951R

K9

**LIST OF AUTHORISED AGENTS FOR THE SALE OF LOK SABHA
SECRETARIAT PUBLICATIONS**

Sl. No.	Name of Agent	Agency No.	Sl. No.	Name of Agent	Agency No.
ANDHRA PRADESH			12.	Charles Lambert & Company, 101, Mahatma Gandhi Road, Opposite Clock Tower, Fort, Bombay.	30
1.	Andhra University General Cooperative Stores Ltd., Waltair (Visakhapatnam)	8	13.	The Current Book House, Maruti Lane, Raghunath Dadri Street, Bombay-1	60
2.	G.R. Lakshipathy Chetty and Sons, General Merchants and News Agents, Newpet, Chandragiri, Chittoor District.	94	14.	Deccan Book Stall, Ferguson College Road, Poona-4.	65
ASSAM			15.	M/s. Usha Book Depot, 585A, Dhira Bazar, Khan House, Girgaum Road, Bombay-2 BR.	5
3.	Western Book Depot, Pan Bazar, Gauhari.	7	MYSORE		
BIHAR			16.	M/s. People Book House Opp. Jagamohan Palace, Mysore-1.	16
4.	Amar Kitab Ghar, Post Box 78, Diagonal Road, Jamshedpur.	37	RAJASTHAN		
GUJARAT			17.	Information Centre, Government of Rajasthan, Tripolia, Jaipur City.	38
5.	Vijay Stores, Station Road, Anand.	35	UTTER PRADESH		
6.	The New Order Book Company Ellis Bridge, Ahmedabad-6.	63	18.	Swastik Industrial Works, 59, Holi Street, Meerut City.	2
HARYANA			19.	Law Book Company, Sardar Patel Marg, Allahabad-1.	48
7.	M/s. Prabhu Book Service, Nai Subzimandi, Gurgaon, (Haryana).	14	WEST BENGAL		
MADHYAPRADESH			20.	Granthaloka, 511, Ambica Mookherjee Road, Belgharia, 24 Parganas.	10
8.	Modern Book House, Shiv Vilas Palace, Indore City.	13	21.	W. Newman & Company Ltd., 3, Old Court House Street, Calcutta.	44
MAHARASHTRA			22.	Firma K. L. Mukhopadhyay, 611A, Banchharam Akrur Lane, Calcutta-12.	82
9.	M. s. Sunderas Ginchand, 601, Girgaon Road, Near Princess Street, Bombay-2.	6	23.	M/s. Mukherji Book House, 8B, Duff Lane, Calcutta-6.	4
10.	The International Book House (Private) limited, 9, Ash Lane, Mahatma Gandhi Road Bombay-1.	22			
11.	The International Book Service, Deccan Gymkhana, Poona-4.	26			

**CONFIDENTIAL TO THE HUNDRED AND FIRST REPORT OF THE
PUBLIC ACCOUNTS COMMITTEE (1969-70) PRESENTED TO
LOK SABHA ON 31.3.1970.**

<u>Page</u>	<u>Para</u>	<u>Line</u>	<u>For</u>	<u>Read</u>
(1)	-	4	Delete the word	'CHAPTER'
		21	64	65
		23	67	68
2		6-7	"in vector....number"	"in vector mosquitoes etc. As a result of these factors, 71.38* opera- tional units"
		14-16	Delete the words	"The matter about the actual additio- nal outlay required for completion of the progra- me under the Fourth Five Year Plan."
6.	1.7	14	year	years
12	Col 3	4	blood	blood
14		5	inot	not
19	1.24	3	resistence of	resistence to
20	1.27	22	infrastructure	infrastructure
32		21	10 '5'	150
37	-	4-5	aminoquinol- iness	aminoquino- liness
		12	screenings	screening
	1.53	2	insecticides	insecticide
		13	The Mahara- shtra	In Maharash- tra
46	1.73	6	198	1987
47	1.75	4	Delete the word	"report"
50	1.83	3	guidlines	guidelines
51	1.90	5	implemen- tation the programme	implementa- tion of the programme
53		6	71.35	71.31
73	Col 4	21	detention	detection
75	Col 4	21	85,464 tons	2,464 tons
76	Col 4	17-18	aminoqui- noliness	aminoquino- lines
77	Col 4	2	screening	screening
80	Col 4	5	had been	had then
	Col 4	21	Delete the word	"report"
81	Col 4	10	guidlines	guidelines

CONTENTS

	PAGE (iii)
REPORT OF THE PUBLIC ACCOUNTS COMMITTEE 1969-70	(v)
CHAPTER (i) Rephasing of the National Malaria Eradication Programme	3
(ii) Provision of basic health services	20
(iii) Provision of insecticides and anti-malarial drugs	28
(iv) Problem of vector resistance to insecticides	37
(v) Personnel problems	40
(vi) Problems of transportation	45
(vii) Miscellaneous.	47
APPENDICES	
I Statements showing the phasin of the programme in States where there had been reversions and in States where there had been none.	53
II Statement showing Recommendations of annual Appraisal teams from 1965 to 1969 and action taken thereon.	55
III Statement showing Number of units Statewise in which defects were pointed out by the Appraisal Teams.	59
IV Statement showing Imports of DDT and anti-malarial drugs during the past five years.	64
V Summary of the main conclusions/recommendations of the Committee	67

PART II*

Minutes of the Sixth sitting held on 27.6.1969 (F. N.)

Minutes of the Thirty-third sitting held on 22.12.1969 (A. N.)

*Not printed (one cyclostyled copy laid on the Table of the House and five copies placed in the Parliament Library).

336.3451R
Ka

PUBLIC ACCOUNTS COMMITTEE

(1969-70)

CHAIRMAN

Shri Atal Bihari Vajpayee

MEMBERS

2. Shri Syed Ahmed Aga
3. Shri Bhagaban Das
4. Shri C. Chittibabu
5. Shri K. G. Deshmukh
6. Shri Bimalkanti Ghosh
7. Shri K. M. Koushik
8. Shri Mohan Swarup
9. Shri H. N. Mukerjee
10. Chaudhary Nitiraj Singh
11. Shrimati Sushila Rohatgi
12. Shri Ram Awtar Sharma
13. Shri Ramshekhar Prasad Singh
14. Shri Tayappa Hari Sonavane
15. Shri Balgovind Verma
16. Dr. Z. A. Ahmad
17. Shri A. P. Chatterjee^c
18. Prof. Shanti Kothari
19. Shri S. S. Mariswamy
20. Shri G. H. V. Momin
21. Shri N. R. M. Swamy
22. Shri Tarkeshwar Pandey

SECRETARIAT

Shri Avtar Singh Rikhy

Shri A. L. Rai

Shri K. Seshadri

— *Joint Secretary.*

— *Deputy Secretary.*

— *Under Secretary.*

INTRODUCTION

I, the Chairman of the Public Accounts Committee, as authorised by the Committee, do present on their behalf this Hundred and First Report (Fourth Lok Sabha) on Paragraph 107 of Audit Report (Civil), 1969, relating to the Ministry of Health, Family Planning, Works, Housing and Urban Development (Department of Health).

2. The Audit Report (Civil), 1969 was laid on the Table of the House on 18th April, 1969. The Committee examined paragraph 107 relating to the Malaria Eradication Programme at their sitting held on the 27th June, 1969 (F.N.). The Committee considered and finalised this Report at their sitting held on the 22nd December, 1969 (A.N.). Minutes of these sittings form part II* of the Report.

3. A statement showing the summary of the main conclusions/recommendations of the Committee is appended to the Report (Appendix V). For facility of reference these have been printed in thick type in the body of the Report.

4. The Committee place on record their appreciation of the assistance rendered to them in the examination of this case by the Comptroller and Auditor General of India.

5. The Committee would also like to express their thanks to the officers of the Ministry of Health, Family Planning, Works, Housing and Urban Development, (Department of Health) for the Co-operation extended by them in giving information to the Committee.

ATAL BIHARI VAJPAYEE,
Chairman,
Public Accounts Committee

NEW DELHI;
January 22, 1970.
Magha 2, 1891 (Saka).

*Not printed. (One cyclostyled copy laid on the Table of the House and five copies placed in Parliament Library).

**MINISTRY OF HEALTH, FAMILY PLANNING AND URBAN
DEVELOPMENT**

(Department of Health)

AUDIT REPORT (CIVIL), 1969
NATIONAL MALARIA ERADICATION PROGRAMME

Audit Paragraph

The national malaria eradication programme was started in 1958 with the object of eradicating malaria from the entire country. Prior to this, a malaria control programme was in operation for five years from 1953-54 to 1957-58. The eradication programme is executed by the State Governments—insecticides, drugs and transport being provided to them by the Government of India. Sixty per cent of the operational cost is also given to State Governments as Central grant. The total expenditure incurred by Government of India on the programme during 1958-59 to 1967-68 was Rs. 154.64 crores.

There are three stages of operation in the programme, viz., (i) attack phase of about three years during which spraying of areas with D.D.T. is done; (ii) consolidation phase of about three years, when spraying is withdrawn and surveillance is started; and (iii) maintenance phase during which vigilance services are maintained and supervision of the operational units is taken over by the local authorities. 393.25 operational units are functioning in the country, each unit covering a population of 1.3 to 1.5 millions (one million prior to 1959-60).

According to the original time-schedule, the programme was to be completed by 1967-68. However, this could not be done because of (i) the more rigid criteria laid down by the World Health Organisation for entry of a unit from one phase to another; and (ii) certain serious set-backs such as delay in putting surveillance machinery on ground in some States and focal outbreaks of malaria from 1964 onwards, mainly in Gujarat, Madhya Pradesh, Maharashtra, Rajasthan, Bihar and Uttar Pradesh, leading to progressive increase in the annual parasite incidence. This incidence constituted 0.21, 0.31 and 0.57 per thousand population during 1965, 1966 and 1967 respectively. According to the National Malaria Eradication

(i) Rephasing of the National Malaria Eradication Programme

1.1. The National Malaria Eradication Programme was launched in the country in the year 1958 and has completed eleven years of operation. The programme is assisted by the USAID and the World Health Organisation. The USAID gives material assistance on long term loan basis, while the World Health Organisation meets partially the expenses of a Regional Co-ordinating Organisation, apart from providing travel fellowships.

1.2. The underlying concept of the Malaria Eradication Programme has been stated in the Ninth Report of the Expert Committee on Malaria set up by W.H.O. in the following terms:

“A Malaria Eradication Programme is based on the concept that total, regular and complete coverage with a given dose and cycle of insecticide will result in an early and complete interruption of transmission and a steady diminution of the reservoir of infection to a point where residual foci or cases can be effectively eliminated by surveillance procedures.”

1.3. Apart from a preparatory phase, when the administrative structure and operational cases for the programme are organised, the scheme goes through three well defined phases—attack, consolidation and maintenance. These phases have been described in a recent publication of W.H.O.* as follows

Attack phase:

“Attack measures are commenced when all is in readiness. The objective is total effective coverage until interruption of transmission of malaria and emptying of the parasite reservoir have been achieved. Periodic spraying with a residual insecticide is the main attack measure but may be supplemented by using anti-larval measures and anti-malarial drugs in some circumstances. The degree of interruption of transmission is measured early in the attack phase by statistically controlled sampling methods. Later, case-finding methods are employed and when the results of those show that the amount of malaria is so small that it can be dealt with by a surveillance mechanism, indicated by certain

*“Manual of Epidemiology and Epidemiological Services in Malaria Programmes” by Prof. R.H. Black; W.H.O., 1968.

Programme Directorate, these setbacks to the programme were mainly due to failure to provide or utilise basic health services properly in the maintenance phase; insufficient supply or late arrival of D.D.T. in the operational areas; inadequate transport facilities; insufficiency of laboratory services; inadequacy and low morale of the staff employed under the programme; resistance to D.D.T. in vector mosquitoes to the attack phase, which resulted in increasing the number were reverted in 1968-69 from the consolidation and maintenance phases to the attack phase, which resulted in increasing the number of units in the attack phase to 112.98 against 103.01 units in 1964, thereby sliding back the programme substantially. The programme was rephased in 1968 so as to be completed by 1975. A total outlay of Rs. 80.13 crores has been proposed by the Directorate for this programme under the Fourth Plan. The matter about the actual additional outlay required for completion of the programme under the Fourth Five Year Plan. The matter about the actual additional outlay required for completion of the programme is, however, stated to be under consideration of Government (January, 1969).

The Orissa Government has been paying an allowance of Rs. 5 per mensem to each surveillance worker to enable him to meet rent of office accommodation. (No other Government pays such an allowance). No allowance is actually admissible to the workers as (i) these persons are field workers attached to unit offices and are required to make extensive tours for collecting surveillance data; (ii) approval of Government of India for payment of this allowance has not been taken by the State Government; and (iii) there is nothing on record to indicate whether the amount is actually spent by the workers on hiring of office accommodation. The amount paid to the surveillance workers during 1962-63 to 1966-67 was Rs. 6.32 lakhs.

From April, 1958 to March, 1968 D.D.T. and other anti-malaria drugs costing about Rs. 1.98 lakhs were lost in transit. No information was available with the Ministry whether recoveries in respect of these losses had been made by the consignee State Governments from the railway/steamer authorities.

[Paragraph 107, Audit Report (Civil), 1969].

*In addition to these, 12, 17 and 24 units were temporarily reverted from the consolidation phase to the attack phase during 1965, 1966 and 1967 respectively.

criteria which must be met, spraying is stopped and the consolidation phase begins. This mechanism also identifies persistent foci of transmission which must be given special attention.

The attack phase in the usual sort of case may be expected to last for about four years."

Consolidation phase:

"In the consolidation phase insecticidal cover has been withdrawn and all cases of malaria are sought out by case detection methods and are investigated. Fever cases are given 'presumptive' treatment and confirmed cases, radical treatment. Confirmed cases are investigated to determine the origin of the infection. Foci of persistent transmission are identified and eradicated. As has been mentioned some of these functions have already been commenced in the later years of the attack phase.

Surveillance is carried out by a finite number of personnel capable of a certain work load. It is for this reason that the consolidation can only start when the number of cases has been brought below a certain defined limit. If spraying is interrupted prematurely or if for any other reason the number of cases becomes excessive, the area must revert to the attack phase.

The consolidation phase ends after at least three years' adequate surveillance (during at least two of which no large-scale specific attack measures have been applied) has demonstrated the absence of any new indigenous cases and the depletion of the reservoir of infection. The maintenance phase may then begin."

Maintenance phase:

"The maintenance phase begins when the criteria for eradication have been met. The primary objective at this stage is the prevention of re-establishment of malaria. The activities involved become part of those of the general health service with which the malaria eradication service is integrated one way or another.

This phase will last as long as malaria exists in the world."

1.4 The organisation of the National Malaria Eradication Programme in India has, according to information furnished to the Committee, been on the following lines:

"At present under the Indian Programme a population of 502 million, out of the total population of 517 million, is being protected by 393.25 NMEP units. Nearly 15 million population of the country is living in high altitudes, where there is no malaria transmission.

Each N.M.E.P. unit was originally designed to protect a population of about one million, however, at present population per unit is between 1.3 to 1.5 million.

The above N.M.E.P. units are distributed over seventeen states and ten union territories. The Central Government coordinates and plans the eradication strategy on a National basis through the Directorate National Malaria Eradication Programme. The programme is executed by the State Governments who are administratively responsible for all health programme including the N.M.E.P."

1.5. The total expenditure incurred on the programme from 1958-59 to 1967-68 amounted to Rs. 154.64 crores. The break-up of this expenditure is as under:

Operational cost	—Rs. 95.37 crores
Central Estt. and W.H.O. expenditure	—Rs. 1.45 crores
Cost of materials and equipment	—Rs. 57.82 crores
(Insecticides)	— Rs. 49.08 crores
Anti-malaria drugs	Rs. 2.77 crores
Transport	—Rs. 2.06 crores
Equipment	—Rs. 1.20 crores
Customs duty	—Rs. 2.71 crores)
Total	—Rs. 154.64 crores

According to information furnished to the Committee, out of the total expenditure of Rs. 154.64 crores on the programme, the foreign exchange component amounted to Rs. 38.31 crores.

1.6. The total investment on anti-malaria operations constituted "as much as 12.72 per cent of the total Central and State health budgets". The pattern of assistance for the scheme was as under:

"Since 1958-59 to 1966-67, the Government of India provided 50 per cent cash subsidy on account of operational cost over and above the National Malaria control level committed expenditure. Insecticides, drugs, equipment etc. were given free to the States.

For the next two years the subsidy on operational cost was increased to 60 per cent. During the IV Plan this assistance has been raised to 100 per cent."

1.7. The Committee drew the attention of the representatives of Ministry of Health to the fact that in the draft outline of the Fourth Five Year Plan which was published in 1966, "a very optimistic report" about the progress of the scheme had been given. The draft outline of the Plan had then anticipated that a provision of Rs. 19.21 crores would be adequate for the successful fulfilment of the project by the second year of the Fourth Plan (1968-69). However, in the revised draft Fourth Five Year Plan presented this year, the estimate of financial requirements had undergone an upward revision to Rs. 80.13 crores. The latest assessment was that the outlay on the scheme would be Rs. 91.74 crores and that it would be completed by 1974-75. The Committee enquired why this situation had risen. The Additional Secretary, Ministry of Health replying stated:

"It is true that in earlier year, we were hoping that this programme will be over within 10 years. Unfortunately, that did not materialise. It is not that we have not been trying to do that. There have been certain difficulties, some inadequacies on our part, some inadequacies on the part of the States, and also certain phenomena which occurred. . . . Our expectations that these units will go into maintenance phase at a particular time did not materialise to some extent. Then, certain rigid criteria were applied to the classifications of units in attack phase. First, the W.H.O. laid down that there should be 500 in a million and later it was laid down that there should be 100 in a million. That had some effect. Then. . . in earlier period there were delays in getting imports and making the supplies to the area concerned. That also had the effect of delaying sprays and having no sprays in certain areas.

There were certain administrative weaknesses in the States. Recently, our team visited three or four States. They have been experiencing difficulties about staff, transport, supply and other things. Lastly, there have been difficulties about the behaviour of mosquitoes themselves. This is causing us concern in no small way.

I, therefore, very respectfully submit that there have been difficulties. We had to rephrase the whole programme. We are trying to overcome these difficulties. May I assure you that ours is not the only country where we have had these setbacks. All

our neighbouring countries... have had far greater setbacks. It is not that this is a matter of great satisfaction to us. We are only trying to say that we need not be highlighting only our failures. If we see the overall picture, we will find that, before the anti-malaria programme started, there were 75 million cases every year, but now it is less than 0.30. There has been progress. Not that we would like to rest on that, but we need not ignore it either."

"Whenever our team goes into the fields and finds out loopholes and drawbacks in the programme, we do point out this to the State Governments.... In the last few months, we have been studying the position in Gujarat, Orissa and Madhya Pradesh. We do find that in certain areas in respect of certain matters there is complete failure of the programme and we tell them and request them to see that these things do not recur. We wait till our next visit to see whether the things have been set right or not."

1.8. The Committee asked for details of the projected expenditure of Rs. 91.74 crores on the Scheme as re-phased. The details have been furnished by the Ministry of Health in a note. The break-up of the expenditure indicated in the note is:

	Materials and equip- ment	Opera- tional cost	Total
(in lakhs of rupees)			
National Malaria Eradication Programme	2970.69	5982.91	8953.60
Urban Malaria	101.91	118.09	220 00
	3072.60	6101.00	9173 60

1.8. The year-wise distribution of expenditure has been given as under:

Year	Urban Malaria	N.M.E.P.
	(in lakhs of rupees)	
1968-69	—	1679.82
1969-70	—	1443.67
1970-71	56.16	1690.75
1971-72	53.47	1505.73
1972-73	54.60	1302.04
1973-74	55.77	1057.81
1974-75	—	273.78
	220.00	8953.60

As a result of set-back to the programme, 71.38 operational units in the programme reverted from the consolidation and maintenance phase to the attack phase of the programme. The Committee enquired about the details of re-phasing and reasons therefor. From information furnished to the Committee in this regard the following position emerges:

"The programme made satisfactory progress till 1963-64. However, from 1964-65 onwards there were some set-backs on account of focal out-breaks in consolidation and maintenance phase areas for various reasons. Some of the unit areas were temporarily reverted to spray attack from 1965 onwards. The temporary reversions were 11.59 unit areas in 1965, 16.74 unit area in 1966 and 23.95 unit areas in 1967. These reversions were not reflected in the phasing of the programme and their requirements were met out of normal budget allotment of N.M.E.P.

The temporary reversions were made on ad-hoc basis. However, the continuing focal out-breaks and rise in the incidence of malaria in certain consolidation and maintenance phase areas necessitated, a more realistic approach for rephasing the programme. Therefore, for such a rephasing a uniform criteria was evolved in consultation with State Malariologists, WHO and USAID experts."

1.10. A statement showing the state-wise reversions of the units has been furnished to the Committee as follows:

State	Reverted from		
	Consolidation	Maintenance	Total
Astam	1.57	—	1.5
Bihar	2.625	—	2.625
Gujarat	13.02	2.12	15.14
Haryana	0.06	0.77	0.83
M.P.	15.24	2.00	17.24
Maharashtra	6.19	—	6.19
Orissa	0.20	—	0.20
Punjab	0.25	1.62	1.87
Rajasthan	6.69	4.59	11.28
U.P.	5.94	8.50	14.44
Total :	51.785	19.60	71.385

"From the above, it would be seen that 67.115 unit areas, i.e., 94 per cent of the reversions were from the States of Bihar, Gujarat, Madhya Pradesh, Maharashtra, Orissa, Rajasthan and Uttar Pradesh.

The bulk of reversions were, however, from three States, viz., Gujarat, Madhya Pradesh and Rajasthan."

1.11. Two detailed statements showing the phasing of the programme in States where there had been reversions and in States where there had been none appear as Appendix I to this Report. The Committee observe therefrom—

- (i) In 10 States with a total of 251.92 units, 71.31 units reverted to the attack phase (51.785 from consolidation and 19.53 from maintenance).
- (ii) In the other 7 states 8 union territories and 3 special entities with a total of 141.33 units, there have been no reversions.

1.12. The reasons for the "failure" of the programme in the three states, where the bulk of the reversions occurred, has been described by the Ministry in a note as follows:

"The reasons for the failure in these three States are:

(A) Operational failure including:

- (i) Patchy and poor spray coverage;
- (ii) Inadequate supervision;
- (iii) Urban malaria.

(B) Administrative:

- (i) Large number of vacancies in the cadre of surveillance workers and surveillance inspectors due to emergency ban in Rajasthan.
- (ii) Inadequate laboratory services.
- (iii) Indiscipline in lower category of staff.
- (iv) Lower morale of staff.
- (v) Inadequate and untimely supply of insecticides.
- (vi) Inadequate transport."

1.13. The Committee enquired whether the focal outbreaks of malaria in a few States like Gujarat, M.P., Rajasthan, Bihar and U.P. since 1964 was due to basic health services not being developed as in other States. One of the witnesses stated:

"If you will permit me to say in a general way I would say that perhaps in Madhya Pradesh the basic health services have not so well developed as in some other States. In Maharashtra, in one small-area the mosquitoes have become resistant to DDT and BHC. This problem of resistance to these insecticides has also been found in a small area in Gujarat. There are several reasons for the set-back to the Malaria Eradication Programme. Resistance of mosquitoes to insecticides is only one factor. The other important factor is inadequate basic health services in those areas where the programme is in the maintenance phase. If proper basic health services are developed and good vigilance kept in these areas, there is no danger of reversion. However, if this vigilance is not maintained there is a great risk of reversion."

1.14. The Committee asked for statistics about the number of blood smears examined and positive cases of malaria detected over a period of time. In a note on this point, the following position in this respect has been brought to the Committee's notice:

"The procedure of examination of blood smears from all fever cases in the Malaria Eradication Programme was introduced with the commencement of the surveillance operations which

were started only in 1961. Before the year 1961, the blood examination was being done only in relation to malario-metric surveys. (Spleen and blood examination of children). However, during the years from 1958 to 1960 hospital and dispensary statistics were used as one of the malario-metric indices on the basis of the total number of cases due to all diseases attending the hospitals and the number of clinical cases of malaria.

A statement showing the number of blood smears examined and number of positive cases from 1961 to 1968, is given below:

Year	No. of blood smears examined (in million)	No. of positive cases	No. of cases of all diseases (in million)	No. of clinical malaria cases
1958	—	—	47.41	1915976
1959	—	—	78.95	1992184
1960	—	—	103.88	1387009
1961	13.10	49151	—	—
1962	26.10	57575	—	—
1963	38.70	87306	—	—
1964	44.46	112942	—	—
1965	40.67	100185	—	—
1966	39.83	148156	—	—
1967	40.42	278621	—	—
1968	41.95	274881	—	—

1.15. The Committee enquired whether adequate laboratory facilities for testing smears were available. The witness replied: "To tell you the truth that is another weakness in our programme." The Committee asked for detailed information about the backlog in examination of slides and enquired whether, with substantial backlog of cases, information about incidence of malaria could be deemed to be complete and reliable. In a note on this point, the Ministry of Health have explained the position as under:

"The statement showing the total number of blood smears collected, examined and the number of blood smears which could not be examined from 1961 to 1968 is as under:

Years	No. of blood smears collected (in million)	No. of blood smears examined (in million)	Balance (The No. of slides which could not be examined during the year (in million))
1961	16.10	13.10	3.00
1962	27.30	26.10	1.20
1963	40.60	38.70	1.90
1964	45.16	44.46	0.70
1965	41.28	40.67	0.61
1966	40.49	39.83	0.66
1967	41.04	40.42	0.62
1968	42.22	41.95	0.27

The main difficulty encountered in getting the slides examined was inadequate number of technicians in the laboratories. The number of technicians originally allotted was only two per unit. This number was subsequently found inadequate and was raised to four per unit. Even by increasing the number, the examination of blood smears was not completed in most of the laboratories. A few superior field workers were trained in microscopy and the States were advised to employ 8 to 10 microscopists on the work. In this way, 4 regular technicians were assisted by 4 to 6 superior field workers duly trained in microscopy. This arrangement also did not help in meeting the requirement of blood examination adequately. The collection of blood smears increased considerably due to stabilisation of surveillance procedure. The Independent Appraisal Teams in the year 1966 went through the question of backlog smears. These teams recommended that regular laboratory technicians should be employed at the rate of one technician for one lakh population.

The figures show that the backlog of the unexamined blood smears underwent gradual decline from 1964 onwards. Incidentally these figures of unexamined slides include breakage. As the number of unexamined slides is getting small, the incidence-

figures are reflecting the situation more correctly. During the year 1968 the backlog was only 0.27 million out of the total number of 42.22 million blood smears."

1.16. As to the incidence of malaria over the last two to three decades, the Committee find the following position from information furnished to them by Ministry of Health:

"The incidence of malaria in the country was not less than 100 million a year and of these one million died every year 1935-36). Minimum loss on this account was about Rs. 10,000 million. The estimate made during the post partition period indicated the annual incidence of 75 million cases. The earlier data when projected to post partition population, the minimum loss was to the extent of Rs. 7500 million. The reduction during 1967 was by 99.6 per cent as the total number of cases were only 0.28 million against 75 million in 1952-53. It can safely be assumed that there would be similar reduction in the economic loss. In other words the reduction towards economic loss can be assumed to be 99.6 per cent of Rs. 7500 million, i.e., about Rs. 7472 million during the year."

1.17. The Committee were given to understand that, in addition to field visits by National Malaria Eradication Programme Directorate, the programme in India was subjected to critical review by Dr. E. H. Hinman of T.C.M. A copy of his report has also been made available. A perusal of this report brings out that certain vital deficiencies in the programme were highlighted by the Team. The relevant excerpts are given below:

(i) *Spraying:*

"The spraying operations carried out to-date during the attack phase, constituting the principal pillar of the eradication structure, are impressive chiefly in their magnitude. Some Units—very limited in number—have demonstrated that complete and uniform applications of insecticides can be accomplished with the personnel and equipment available. However, the spraying operations have not generally attained the desired precision in (a) treatment of all existing houses or (b) uniform coverage of sprayable surfaces in the individual houses and associated structures. The team believes that the benefits of residual insecticidal coverage can be more fully exploited by meticulous attention to all details of spraying operations."

"Less-than-complete coverage of many villages and less-than-complete treatment of sprayable surfaces which individual houses are frequently occurring because many houses are locked or because the householders, for many reasons, refuse to permit spraying. The Team does not minimise the gravity of these problems, but feels that many field personnel are too inclined to accept them as excuses for superficial coverage of houses and villages. It is recommended that Senior Unit personnel intervene directly at the village level to distinguish between those refusals which can be resolved immediately and those which may require special or prolonged effort."

"In summary, various aspects of the spraying operations lack the refinements desired in a malaria eradication programme and reflect a lack of the engineering personnel who are particularly effective in achieving precision in large scale operations in other countries. The spraying techniques now being employed will doubtless prove adequate in many areas with low anopheline populations; in areas where surveillance procedures reveal continued transmission it will be difficult to exclude inadequate spraying operations as the cause of the failures. Qualitative and quantitative intensification of field supervision at all levels is essential to improve the quality of spraying operations."

(ii) *Surveillance:*

"In December, 1959, the Indian Workers Conference determined that active surveillance would begin as of April 1, 1960. However, due to inability to obtain immediate sanctions in many States there are few areas that now approach 75 per cent coverage. Several have no surveillance workers in the field. This means that there is no accurate information concerning the occurrence of malaria during the 1960 season. Such data would have been of tremendous help for the planning of the 1961 spraying schedules. Now it is almost certain that many areas which could otherwise have been considered for withdrawal of spraying will have to receive coverage in 1961."

"The Team has observed that only limited use has been made of an extremely fruitful and sensitive source of epidemiological information, namely, the examination of blood smears obtained from all fever cases encountered in hospitals, primary health centres and other dispensaries. A master plan exists for future national exploitation of this so-called passive surveillance but the Team believes that, insofar as possible, individual

Units or States should be directed to institute such service immediately. Upon insistence that dispensaries obtain blood smears from all fever cases, the malaria service must recognise its obligation for immediate examination of these slides and furnishing of the results."

(iii) *Epidemiological Investigation:*

"The blood film examinations in the past two years have revealed an exceedingly low positivity and the examination of 11,000 blood films from infants and children from each of nearly 400 units in India burdens about 800 technicians with almost certain negative results. The time of the Unit Malaria Officer concerned in this profitless activity will most certainly detract from the potentially more profitable surveillance activities. Reconsideration of the entire plan for these mass surveys is essential. Otherwise the urgent work of active surveillance will be delayed. Unfortunately many unit officers are still planning these.

It came as a shock to the Team that in certain instances spleen surveys were performed by senior malaria inspectors and by other non-medical personnel. Elsewhere in this report the statement has been made that spleen surveys are now practically useless. Those done by non-medical personnel are considered worthless."

(iv) *Anopheline Resistance to Insecticides:*

"One of the most compelling arguments for the immediate accomplishment of malaria eradication in India and globally is the evidence that loss of susceptibility to residual insecticides is occurring in various species of malaria-transmitting mosquitoes. Anopheline resistance to insecticides in limited portions of a country does not mean that malaria eradication will become impossible. However, widespread development of this phenomenon will greatly change and complicate the technique to be employed, with vastly increased costs."

"The most serious anopheline resistance threat is that represented by the *A. culicifacies* situation in mid-western India, especially in the Panch Mahal area of Gujarat State. According to findings of the WHO Malaria Eradication Advisory Team No. 2, the susceptibility to DDT of this important malaria vector has declined sharply since early 1960, a small percentage of the tested specimens has withstood 8 hour exposures to 4 per cent DDT

papers, and specimens have been observed resting on fresh DDT deposits. The local inclination to label this survival as 'tolerance' cannot make the anophelines less resistant, nor should it obscure the urgency of prosecuting the malaria programme with maximum dedication and finesse in order to complete it while present weapons can still do the job."

1.18. On the question of insecticides resistance encountered in the Malaria Eradication Programme, the Committee note that an Expert Committee on Malaria set up by the World Health Organisation had in a report* sounded the following note of warning as early as 1962:

"Resistance to insecticides has been reported at the end of 1961 in 24 species of *Anopheles* mosquitoes; of the 15 of these which are important vectors of malaria, 1 has shown resistance to DDT only, 5 to dieldrin only, and 9 to both insecticides. For the most part, such resistance exists in limited, circumscribed areas. In a number of cases, however, the development of resistance has caused disruption of the operational programme in the area where it occurs, though in no case, so far, has the prospect of eventual malaria eradication been placed in jeopardy. However, where vectors such as *A. stephensi*, *A. albimanus* and *A. pharoensis* show a high degree of resistance to dieldrin and considerable tolerance to DDT, progress may be hampered should the DDT tolerance increase and spread."

"In a number of programmes the development of insecticides resistance in the vector species had impeded the progress of the work. In those cases where the vector species has developed resistance to only one insecticide—for example, *A. gambiae* to dieldrin in West Africa—it has been necessary to change over from the insecticide previously in use to a new one, with consequent difficulties such as delays due to ordering, retraining of spraymen, etc. The development of increased tolerance or resistance by the vector to the insecticide used may necessitate changes in operation that may result in an increase in the financial burden of the campaign.

The delay in the progress of a programme entailed in shifting from one insecticide to another, and the delay and subsequent increase in length of the programme caused if there is a resumption of transmission following the development of resistance, also adds to the cost of the programme."

*Ninth Report (1962) W, H. O. Technical Report Series 243.

1.19. The Committee were also informed that an annual appraisal of selected areas in the country was done by teams of international and National experts not directly connected with the programme. Copies of these annual appraisals from 1965 to 1969 have been made available by the Ministry of Health. A statement showing the recommendations of those appraisal teams and action taken thereon appears at Appendix II to this report. The Committee note from the reports of the appraisal teams that they incorporated observations about various deficiencies noticed in the Scheme. The main deficiencies pointed were—

- (i) unsatisfactory spraying;
- (ii) poor surveillance;
- (iii) inadequate laboratory facilities;
- (iv) defective blood smearing and delayed examination;
- (v) lack of epidemiological investigation.

Statement at Appendix III shows the number of units State-wise in which these defects were pointed out by the Appraisal Teams.

1.20. The Committee enquired whether, in view of the set-back caused to the programme, any detailed investigation was afoot to ascertain the cause of the set-back and to remedy them. From information that has been furnished, the Committee observe that the Government of India have appointed a Fact Finding Committee "under the chairmanship of a senior administrator from Ministry of Health with members from W.H.O. and Director of Health Services of 2 major States and a senior technical officer from Director General of Health Services as a member Secretary. The Committee will evaluate in depth the present status of the programme in the country and suggest remedial measures." The report of the Committee, according to the indication given by Government, "is still awaited."

1.21 The Committee are perturbed over the set-back suffered by the National Malaria Eradication Programme. The Scheme, which was started in 1958-59, made satisfactory progress till 1963-64, but lost ground thereafter. The figures of positive cases detected from an examination of blood smears reflect this position. The number of cases, which was 87,306 in 1963, rose to 1,12,942 in 1964, with a marginal fall in 1965, when it was 1,00,185. The number rose again to 1,48,156 in 1966 and nearly doubled to 2,78,621 in 1967, with no appreciable reduction in the subsequent year. As a result, the programme underwent a fairly drastic re-phasing in 10 out of 17 States. 71.31 Malaria Eradication Units operating in these States and constituting

well over a fourth of the total number of units were switched back to the 'attack' or preliminary phase of the programme from the 'consolidation' and 'maintenance' phases. What a major set-back this was would be apparent from the fact that the scheme which Government had expected to complete by 1968-69 would now be prolonged till 1974-75. The outlay for completion of the scheme during the Fourth Plan period has in consequence increased from Rs. 19.21 crores, estimated in 1956, to 91.74 crores.

1.22. In the Committee's opinion, a number of deficiencies in the programme contributed to this set-back. The principal contributory factors were:

- (i) Patchy and poor spraying, resulting in what a team of T.C.M. experts had in 1960, characterised as "less-than-complete coverage of many villages and less-than-complete treatment of sprayable surfaces."
- (ii) Failure to develop on the required scale the surveillance or vigilance mechanism, which could have helped in the timely detection of persistence or recrudescence of malaria.
- (iii) Failure to provide adequate diagnostic facilities and rural health services to cope with the deteriorating epidemiological situation.

1.23. A number of agencies who appraised the working of the scheme at various stages had drawn Government's attention to these and other weak points in the scheme. A team of T.C.M. consultants who reviewed the working of the scheme as early as 1950 reported that "the future of malaria eradication in India is dependent almost entirely on the ability of the individual spraymen and the individual surveillance workers to carry out his duties in an acceptable manner and to his supervisors to provide the leadership and directions of eradication activities." Subsequent appraisals of selected areas in the country which were done annually had also warned Government of "unsatisfactory spraying", "unstable surveillance", "inadequate facilities" and "lack of epidemiological investigation", to cite just a few of the drawbacks mentioned by these teams. In spite of these repeated warnings, there was not enough appreciation either on the part of the State Governments, who were implementing the scheme, or on the part of the Government of India, who acted as the co-ordinating agency, of the need for rectifying the deficiencies in the programme and implementing it in a purposeful manner.

1.24. One factor that lent particular urgency to the implementation of the scheme was not adequately appreciated by Government. This was the phenomenon of anopheline resistance of insecticides which became apparent even in the early stages of implementation of the scheme. In 1960, the team of T.C.M. consultants had said that "one of the most compelling arguments for the immediate accomplishment of malaria eradication in India is the evidence that loss of susceptibility to residual insecticides is occurring among various species of malaria-transmitting mosquitoes". They pointed out that though this had occurred "in limited portions of the country", "widespread development of this phenomenon will greatly change and complicate the technique to be employed, with vastly increased cost." In 1962, an expert committee of W.H.O. drew attention to this problem and observed that in a number of programmes all over the world, this had "impeded the progress of work", and "may result in an increase in the financial burden of the campaign." As would be evident from data given later in this report, subsequent developments in the country have proved these fears to be true.

1.25. A redeeming feature in the present situation however is that the outbreaks have occurred in the main in seven contiguous States in Central India. Since this is a compact area, the Committee hope that the situation can be tackled by Government, without great difficulty. In any plan of action that Government may draw up for this purpose, the following points should receive adequate emphasis:

- (i) Improvement in the quality of spraying operations and intensification of field supervision on this activity at all levels.**
- (ii) Intensification, improved coverage and tighter supervision over surveillance operations in the programme.**
- (iii) Parallel and correlated development of rural health services.**

1.26. The Committee further feel that to make the programme effective and ensure its success it is essential to obtain community support for it especially in the rural areas. The civic groups, local influential citizens, Block Development Officers should be approached for cooperation and guidance. Their backing will facilitate greater coordination and cooperation in the conduct of the programme and will also act as a check on the proper discharge of duties by the field staff.

(ii) Provision of basic health services required for the programme

1.27. According to the Fourteenth Report of the WHO Expert Committee on Malaria (1968), a definite plan for basic health services is a "*sine qua non* for embarking on a malaria eradication programme". The plan should seek to create a "health infrastructure", that is, "an organised net work of peripheral units capable of providing basic health needs within the available local resources to cater for the most urgent needs of the population." The functions of the health infrastructure have been set out in the Ninth Report of the WHO Expert Committee as under:

"The functions of the health infrastructure should be of such a nature that they can be carried out by auxiliary health workers able to be trained within the shortest possible time to perform a restricted number of specific tasks. This type of personnel cannot discharge its duties properly unless it is backed by an efficient mechanism for general direction and for regular supervision. The latter aspect needs to be particularly emphasised as it includes methodic evaluation, prompt correction and progressive improvement of the work of the infrastructure."

"While the infrastructure should integrate preventive and curative services, a firm policy should be established to concentrate on the preventive outlook."

"The infrastructure should cover the population as evenly and completely as possible. This is of the utmost importance in malaria eradication, where total coverage of the malarious area is mandatory. It follows, then, that the infrastructure should provide services, though limited, to the entire area rather than concentrate its efforts by providing more complete services in fewer sectors of the population. This may be best achieved by the delimitation of small geographical areas, each under the responsibility of one elementary constituent of the infrastructure, which is hereafter referred to as the health post."

"The health posts should have primary responsibilities in the following fields:

- (1) *Medical care*, by providing services for first aid, symptomatic treatment, standardized treatment of those diseases which are of importance in the area, and early reference to other institutions of conditions which cannot be given proper attention at the posts.

- (2) *Detection and prevention of disease*, through the processes of casefinding, reporting and application of simple procedures for prevention of certain communicable diseases.
- (3) *Collection of statistics*, relating to birth, death and sickness.
- (4) *Maternal and child health* by the provision of simple preventive and curative services to expectant mothers and children.
- (5) *Basic environmental sanitation*, aiming at the provision and proper utilisation of communal and individual sanitary facilities.
- (6) *Health education*, which should have as its ultimate objectives to convince, and not merely to inform, people of the need for good personal and community health and to promote the active participation of the local population in the solution of their own health problems."

1.28. The Committee pointed out that the States have their own health centres. However, the Draft Outline of the Fourth Plan published in 1966 indicated that, for the successful completion of the Malaria Eradication Programme, primary health centres with adequate staff, buildings and equipment would have to be established for vigilance or surveillance activities based on domiciliary visits. The Committee enquired whether health centres already run by the State Governments could not well be utilised for this purpose. The witness stated: "Basic health services are being developed all over the country and primary health centres are being established. Some areas in some States are not covered. Our difficulty is that the personnel are not there. Wherever they are functioning well, they are of great help in the national programme. I am not only talking of Malaria. But where basic health services are well developed, they are a great asset to the national programme. If they are not there, naturally to that extent we do not get their help." The witness also informed the Committee that "the States have not so far been getting assistance for the operational staff. In the Fourth Plan we have a Centrally sponsored scheme of assisting the State Governments to have more staff at the health centres and this scheme, over a five-year period, would cost about Rs. 44 crores. The intention is that the States should be enabled to have at least one basic health worker for every 10,000 of population and the intermediate supervisory staff for that; in addition, the centre should be able to set up laboratories and for that purpose, we propose to assist the States

with technicians." The Committee enquired whether the basic health services had not been planned for earlier. The witness replied: "We have planned, but, after all, the basic health services is a very big question." Asked why there had been delay in putting this surveillance machinery on ground, the witness stated:

"This is a very valid question and I have been very much agitated about it. There are three phases—attack, consolidation and maintenance. After the maintenance stage, all the malarial activities are to be merged with the basic health services and the staff of the primary health centres. In certain areas, we have brought down the incidence of malaria. While we classify the last stage as the maintenance stage, at the same time, effort should have been made, and has been made, in many areas to develop the basic health services which will take over the baby. In the maintenance stage, the malarial baby is in a very modified form, has to be accepted by another agency who will say 'henceforth we will look after the baby and your job is over'. That handing over of the baby from the maintenance phase to the basic health services should have occurred if the centres are properly developed. I must admit that in many areas it could not come about in the manner in which it ought to have come about, and that is because...of the difficulties in regard to finance, staff, personnel and building, etc. Therefore, I must very frankly admit that the synchronising of the handing over of the baby with the basic health services and their coming forward to take over the baby, in some cases, did not materialise."

1.29. According to the guidelines laid down by WHO* properly organised and efficiently operating laboratory services are of "vital importance" in surveillance activities. During evidence it was stated that lack of adequate laboratory facilities "is another weakness in our programme." The Committee enquired whether the difficulty was one of lack of personnel. The Committee pointed out in this connection that the laboratories did not require trained pathologists. The witness stated: "I agree that we do not require a highly trained pathologist for this purpose, nor a very big laboratory. We require a trained microscopist and a few chemicals besides a microscope." The microscopist, he added, "is a para-medical person who has been trained... The number of slides which we have to examine is very large...with the result that they cannot be disposed of quickly. And the slides must be quickly seen so that we know where the infection lies... We require therefore a large number of microscopists who are not there and we have to train them."

*"Manual of Epidemiology & Epidemiological Services in Malaria Programme."

1.30. The Committee note that the Expert Committee of WHO considered methods of improving diagnostic techniques for malaria detection. In their 14th Report (1968), the Committee pointed out that "diagnosis is currently based on the thick blood film, a time-honoured procedure which is the standard practice in all malaria programmes. The sensitivity of diagnosis in the examination of the thick blood film, however, even though properly prepared and stained, is affected by a number of factors... In situation other than clinical medicine such as (i) surveillance activities..., (ii) the detection of malaria parasite carriers in order to prevent importation of infection into malaria areas, (iii) malariometric surveys, (iv) surveys of immune status of large population, and (v) the identification of blood donors suspected of being the source of induced cases, many of the infections encountered are characterised by low levels of patent parasitaemia. In these situations the preventive techniques of blood film examination are insufficiently sensitive." The Expert Committee after considering the problem recommended that "further development of practical serological methods for detection of malaria infections" and that

- (a) research and field studies on practical serological methods be given the fullest encouragement and support;
- (b) studies on the *in vitro* cultivation of malaria parasites should be stimulated and assisted by WHO."

1.31. The Committee observe from the information furnished to them that there have been some difficulties in regard to microscopes received for the scheme. The following table gives data about the number of microscopes obtained for the scheme from various sources from inception to-date:

Year	USAID	WHO	UNICEF (Out of GOI Funds)	Make
1	2	3	4	5
1953-54	75 Nos.	—	—	Bosch and Lomb
1958-59	30 Nos.	—	—	Keowa
1958-59	720 Nos.	—	—	Olympus
1958-59	—	230	—	Meopta
1959-60	30 Nos.	—	—	Olympus
1960-61	150 Nos.	—	—	Olympus
1961-62	800 Nos.	—	—	Olympus

1	2	3	4	5
1963-64	—	600	800	Olympus
1964-65	—	—	732-8*	Olympus
			*Short landed at MSD, Cal- cutta	
1964-65	100 Nos.	—	—	Olympus
Total	1905	830	1524	
	1. Bosch & Lomb	..	..	75 Nos.
	2. Keowa	..	..	30 Nos.
	3. Meopta	..	..	230 Nos.
	4. Olympus	..	..	3924 Nos.
				4259 Nos."

1.32. It was stated in the information obtained at the instance of the Committee that "1905 microscopes were received under USAID programme free of cost. 830 microscopes were received from WHO as gift. 1524 microscopes of Olympus make were procured by Government of India through UNICEF against rupee reimburseable basis out of its own funds at a cost of about Rs. 5.35 lakhs, No microscope was purchased direct from the local market under the NMEP."

1.33. The difficulty in regard to some of the microscopes has been stated as under:

"The general trouble arises with the oil immersion lenses of Olympus microscopes. They generally get hazy very soon and give poor performance. Even after repairs, these do not give clear vision. No particular defects in the Olympus microscopes itself have come to light.

The oil immersion lenses have been procured from M/s. Olympus Co., Tokyo (Japan) as follows from time to time to replace the hazy lenses of the Olympus microscopes:

1951-62	1963-64	1964-65	1967-68	Total
200	400	600	550	1750''

The Committee further observe that difficulties experienced in regard to the microscopes was discussed by certain officials of the Ministry of Health in the course of their visit to Japan in July.

1968 with the representatives of the company. The results of the discussion have been recorded in the following terms:

"During the meeting the following was discussed:

(1) The Company would be able to send their Engineer alongwith one Assistant in the month of January or February, 1969 to look into the repairable microscopes. The cost of such a visit of the experts would be borne by the Company.

(2) The repairable microscopes would be collected in six regions of the NMEP and the team from the Olympus Company would visit the regional Headquarters alone.

(3) Local assistance and under-studies would be provided in each region by deputing technicians to work with the Olympus people.

(4) The under-studies of the team should preferably receive further training for one month in Japan in the campus of the company provided their cost of travel is borne by Government of India."

1.34. In regard to the requirements of microscopes for the programme, the following position has been set out in the material furnished to the Committee:

"The Independent Appraisal Team, 1966, recommended that Laboratory Technicians be provided on a scale of one per 10,000 population. The estimated requirements of microscopes on this basis for the Fourth Five Year Plan are given below:

Year	Estimated population million	Number of Microscopes required.
1969-70	502	5020
197071-	514	5140
1971-72	527	6270
1972-73	540	6400
1973-74	553	5530

At present there are 4259 microscopes with the organisation. Therefore, procurement schedule will be as follows:

Year	Microscopes available	Microscopes required	Microscopes to be procured	Oil immersion to be procured
1969-70	4259	5140	881	514
1970-71	5140	5270	130	527
1971-72	5270	5400	130	540
1972-73 : *	5400	5530	130	553
Total			1271	2134

*The oil immersion lenses will be replaced at the rate of 10 per cent of the existing microscopes each year for the next four years."

1.35. The following further information was supplied at the instance of the Committee:

"We are making all efforts to get the defective lenses repaired locally as far as practicable. WHO has also been kind enough to provide free of cost 1150 new oil immersion lenses of Olympus make for the replacement of defective lenses beyond economical repairs. Most of the new lenses have been supplied to the needy States and 292 lenses are still in reserve stock for the purpose. The matter has also been referred to USAID to approach M/s. Olympus Company in Japan to supply at least 500 new oil immersion lenses for use under NMEP in replacement of the defective ones.

Such troubles have not been reported by the States with lenses of microscopes of other makes. As the lenses of other makes are very costly as compared to Olympus make, the NMEP Directorate did not resort to their purchase due to huge expenditure and the foreign exchange involved."

1.36. In the opinion of the Committee, a definite plan for basic health services is crucial for the successful implementation of the Malaria Eradication Programme. Inadequate appreciation of this point has been responsible for the set-back to the programme in

recent years. The Committee note that, as part of the Fourth Plan Scheme, State Governments are proposed to be assisted to set up health centres at a cost of Rs. 44 crores. The Committee hope this plan would be imaginatively planned and executed, so as to provide a "health infrastructure" which would provide the foundation on which the elementary services can be expanded in an orderly manner. The Committee hope that while implementing this scheme the guidelines laid down by the WHO Expert Committee in their Ninth Report would be borne in mind. As pointed out by the Expert Committee, "the Scheme cannot be too elaborate but must be realistic and adapted to the economic possibilities of the country." Special attention should be given "to those functions likely to produce the best possible return in terms of reducing mortality, morbidity and disability", the work being executed on the basis of "a list of priorities and a firm determination to concentrate action on the most important ones."

1.37. Inadequate laboratory facilities in the country have cramped the provision of diagnostic services to people living in malarious areas. The deficiency in this respect has been repeatedly pointed out by several teams which appraised the working of the Scheme. The Committee note that difficulties are being experienced in getting trained para-medical staff to man these laboratories. The Committee would like to stress the need for a crash programme to recruit the necessary staff and train them adequately.

1.38. One point that should receive particular attention is the need to get blood smears examined in the laboratories very quickly. The data given earlier in this report would show that a large backlog of unexamined slides accumulated in the laboratories between 1961 and 1963. Rapid and correct examination of blood smears is of great importance both for purposes of treatment and epidemiological investigation. The Committee hope that a strict watch would be kept on the laboratories in this regard, as otherwise, the investment of funds in this service will be rendered purposeless.

1.39. The Expert Committee of the WHO have pointed out that slide examination as a diagnostic technique suffers from certain inherent limitations which may render it "insufficiently sensitive" in certain situations. They have therefore suggested that "practical serological methods" for case detection "should be given the fullest encouragement." This is a matter which calls for research support

and the Committee would like Government to initiate studies in this regard with the support of the WHO, so that reliable diagnostic methods are ultimately employed in the laboratories.

1.40. One other point that has come to the notice of the Committee from the information furnished to them deserves mention. Nearly three-fourths (3,924 Nos.) of the total stock of microscopes with the laboratories (4,259 Nos.) have been giving "poor performance" due to oil immersion lenses getting "hazy", a situation which even repairs have not been able to improve. All these microscopes have been obtained from a particular firm overseas, with whom arrangements for their repairs were discussed by Government in July, 1968. The Committee would like to be informed whether these microscopes have been repaired and been giving satisfactory performance. The Committee note that there is a programme for the procurement of 1,271 microscopes representing the requirements over the next four years ending 1972-73. The Committee hope that careful selection of instruments will be made in future keeping in view the past experience. It would appear to be better to go in for microscopes which give trouble free and uninterrupted service.

(iii) Provision of insecticides and anti-malarial drugs required for the programme

1.41. The Committee were given to understand during evidence that "belated supply" of insecticides "due to circumstances beyond our (Government's) control" was one of the factors responsible for the set-back to the programme. The Committee enquired about the circumstances that led to belated supplies. The witness stated: "There was delay in arrival of imports and also transport difficulty within the country due to national emergency created by the conflict with Pakistan." When the Committee pointed out that the Indo-Pak conflict lasted only 18 days, the witness replied: "But its repercussions continued to be felt for a long time. It affected our spraying period, which is a short period of 5 months." The Committee drew attention to the fact that the Indo-Pakistan conflict took place in 1965 and that it could not be adduced as the reason for set-backs to the programme in 1966 or 1967. The witness stated: "The predominant reason was the late arrival of imports because of shipping difficulties, the foreign exchange difficulties and difficulties in finalising the deals with foreign firms." The Committee asked for a statement showing imports of DDT and anti-malarial drugs for the last

five years, indicating also the date of orders, arrival of shipments etc. The information has been furnished and is reproduced at Appendix IV. It is summarised below:

Value of imports of DDT and Anti-malarial drugs—

	1964-65	1965-66	1966-67	1967-68	1968-69	Total
(In lakhs of rupees)						
DDT .	184.81	146.57	136.23	157.52	305.20	930.33
Anti-malarial Drugs .	23.95	18.95	34.72	30.23	28.84	136.69
	208.76	165.52	170.95	187.75	334.04	1067.02

Statement showing time-lag at various stages—

Year	Between proposal and contract stage		Between contract and supply stage	
	DDT	Anti Malarial[Drugs	DDT	Anti-Malarial Drugs
1964-65	4 months	6 months	2½ to 11 months	5 months
1965-66.	5½ months	6½ to 7 months	3 to 11 months	2½ to 7 months
1966-67	4 months	5½ months	3 to 6 months	2 to 9 months
1967-68	2 months to 1 year 3 months	8 months	2½ to 11 months	4½ months
1968-69	7 months to 1 year 2 months	6½ months	1½ to 10½ months	4 months

1.42. The Committee note in this connection from the information furnished to them the following position in regard to shipments:

"The constant delays in the arrival of shipments of DDT every year from abroad had become almost an evil in the India's National Malaria Eradication Programme for the last 4-5 years. Consequently the spray had been throughout untimely and inadequate and as a result it had not been able to interrupt the transmission of the disease in many parts of India and the duration of the programme had to be prolonged to the year 1975. In order to overcome this difficulty this matter was discussed both with the officials of the USAID responsible for procurement of DDT supplies and also with the ISM Washington who assist in obtaining shipments for despatches of such supplies to India. Both the USAID and ISM officials strongly felt that timely spray in India could only be made possible if indents of procurement of insecticides are placed fairly in advance i.e., a year ahead so that total quantities of insecticides required during the year should be available in the country."

1.43. The Committee enquired whether advance action for procurement of insecticides, drugs etc. was taken. The witness replied: "One of the difficulties that we experienced with regard to taking advance action was about Budget allocations and getting clearance from Finance to place orders in advance. After we experienced difficulties in getting supplies in time, we tried and succeeded last year in placing orders in anticipation of budgetary allocation for the coming year." The Committee enquired whether advance orders could not have been placed in the past. They were told, "Sometimes we learn from our mistakes. It could have been done in earlier years."

1.44. The Thirteenth Report of WHO Expert Committee (1967) which analysed the progress of Malaria Eradication Programmes over the world observed that "in nearly half the countries, it was observed that there were delays in the programme due to administrative bottlenecks which...resulted in delays in the provision of supplies and equipment." Listing "the areas of weakness" in this regard, the Expert Committee enumerated the following factors:

"funds specified in the plan were not allotted;

funds were allotted late, making it impossible to employ them before the end of the fiscal year;

funds were allotted in small instalments;

funds were released to intermediate echelons and never reached the field, or reached it with considerable delay;

budget control was rigid and inflexible;

the budget for the plan of operations was adequate but there were no reserve for unforeseen contingencies."

The Expert Committee recommended that "whenever a country decides to undertake a malaria eradication programme funds be budgeted for the whole programme, be available at the planned date and be managed with necessary flexibility."

1.45. The Committee enquired to what extent the country was dependent on imports for insecticides and drugs. It was stated that "70 per cent of the insecticides and 50 per cent of the drugs are required to be imported from abroad"—predominantly from U.S.A. The Committee enquired what efforts had been made to increase indigenous production so as to conserve foreign exchange. The witness stated: "We are having constant dialogue with CSIR in the matter. They are very much interested in this and they are taking all steps to see that we become self-sufficient in the manufacture of basic raw materials out of which the anti-malarial drugs could be made." Asked further when the country was likely to become self-sufficient, the witness added: "It is difficult to venture a date. But, as we control malaria more and more, the requirement of anti-malarial drugs will progressively diminish. Because we started with a high incidence, so our requirement was more. A time may come when our requirement may become less and our indigenous effort may be able to meet our requirement. But, at the moment, it is difficult to say when we will reach that position."

1.46. At the instance of the Committee, a note has been furnished projecting the requirements of insecticides and anti-malarial drugs for the Fourth Plan and the scope for meeting these requirements from indigenous sources. The note is reproduced below:

"The requirement of insecticides for the next five years

(Fourth Five Year Plan) in terms of DDT 75 per cent are as under:

Year	Requirement of insecticides in tons	Quantity indigenously available
1969-70	15,400	4644
1970-71	13,974	5205
1971-72	12,250	5205
1972-73	9,700	5205
1973-74	7,200	5205

Requirement of Anti-malarial drugs:

1969-70	145 million	120 million	Chlore Primaquine	50 million	Chlo. Amodia.
1970-71	165 "	150 "	Chloroquine Primaquine	Amodiaquine	-do-
1971-72	165 "	150 "	Chloroquine Primaquine	Amodia- quine	-do-
1972-73	165 "	150 "	Chloroquine Primaquine	Amodia- quine	-do-
1973-74	165 "	10 '5'	Chloroquine	Amodia- quine	-do-

Regarding the scope for expanding indigenous production of foregoing items, the following comments are offered:

Insecticides:

M/s. Hindustan Insecticides Ltd., New Delhi who manufacture DDT primarily for supply to NMEP have installed another plant to step-up the production from 4000 M. Tons DDT 50 per cent to 6000 M. Tons of DDT 50 per cent annually from 1969-70. This will result in less import of 1333 tons of DDT 75 per cent.

It is expected that from the year 1970-71 the indigenous production of BHC 50 per cent will increase from 1500 M. Tons to

3000 M. Tons resulting in less import of insecticides to the extent of 634 tons DDT 75 per cent.

Antimalaria Drugs

At present only 50 million tablets of chloroquine are procured every year through indigenous sources and the balance quantity imported in powder from USA to be tableted in India to utilise the available capacity of tableting in the country. As regards Primaquine tablets there is no known indigenous source for supplying this drug.

Efforts are, however being made to explore the possibility of attaining self-sufficiency in meeting our requirement of Antimalarial drugs from within the country. DGTD and DGS&D, New Delhi have already been advised of our annual requirement of Anti-malarial drugs and the extent to which these are being imported with a view to ascertain the maximum indigenous potential in order to minimise the import of the items.

It may be added that all indents for imported items are referred to DGTD by the Government for clearance from indigenous angle and only those items and quantities are allowed to be imported which are not known to be available indigenously."

The Committee note from recent Press Reports* that use of DDT is increasingly falling out of favour in the West. "The British Government is expected shortly to announce tight controls on use of DDT and similar organochlorine pesticides. The chemical was banned for two-year trial period by Sweden in March and by Canada this week. Some States in U.S. also ban it. Other countries of Western Europe are expected to follow suit." Certain studies in this regard would also appear to have been conducted in the country. One finding is[@] "Most commonly used insecticides such as DDT, linadane, dieldrin and aldrin are suspected to cause anaemia."

**Hindustan Times* : 7th November, 1969.

Hindustan Times of 12th November, 1969 reports that 6 major pesticides makers of Japan have announced their decision to stop production of DDT and dBHC for domestic consumption.

Statesman of 18th December, 1969 reports that the British Government have imposed restrictions on the use of DDT and other pesticides including a complete stop on their use in home and garden, as a result of the findings of an advising committee on pesticides and other chemicals.

[@]"Challenge of Industrial Toxicology"—Dr. S.H. Zaidi, Industrial Toxicology Research Centre, Lucknow.

1.47. In reply to unstarred question No. 3185 dated 8th December, 1969 in the Lok Sabha, the Minister of Health and Family Planning had stated that he had seen report published in the *Statesman* that Minister of Health of USA had recommended to the President that the sale of DDT should be banned as it might cause cancer. The reply further stated:

“D.D.T. is used in this country mainly for indoor residual spraying on walls and ceilings of the houses for malaria eradication purposes and as a pesticide in agricultural operations. Only 26 per cent of the area in the country which is in the attack phase of the National Malaria Eradication Programme and indoor spraying is restricted to this area in the malaria season. In the rest of the country D.D.T. spray is resorted to at places where there are focal outbreaks of malaria. Chronic poisoning by D.D.T. does not present a problem of such magnitude in India as in other countries where large quantities of D.D.T. have been in use for several years in agricultural operations. The suggestion that experts in India should study the harmful effects of D.D.T. will be considered.”

1.48. The Committee also observe that there have been reports of resistance of malaria parasites to drugs like chloroquine, primaquine and amonioquinolines which the country is now importing. The report of a WHO scientific group entitled “Chemotherapy of Malaria” (1970)* makes the following observations in this regard:

“Chloroquine resistance in *P. falciparum* as seen at present, poses a number of important questions upon which future plans and prospects depend. Among these questions are: Will resistance increase until erythrocytic parasites are completely refractory to the highest dose tolerated by the host? Is there any prospect that resistant parasites, having some competitive disadvantage, may be submerged by sensitivity? Will better understanding of the conditions in which resistance arises lead to effective prevention? Will current research on combinations of known drugs lead to safe and effective alternatives to the 4-aminoquinolines? What are the prospects for the development of new and more effective drugs? Will resistance extend to other parasite species? Is there any chance that the importance of resistance to the 4-aminoquinolines (like quinine resistance after the first world war) will decrease in the future? None of these questions can be answered satisfactorily at present.”

*WHO Technical Report Series: No. 375 (1967).

"Primaquine, even at low dosage, exerts significant gametocytocidal action on *P. falciparum*, *P. vivax*, and probably the other species of malaria parasite that infect man. Inadequate information is available to evaluate the potential role of this compound or its analogues in interrupting transmission in a malaria eradication programme, and the subject deserves further attention in both laboratory and field trials. It is particularly important to determine to what degree and under what conditions this drug will prevent the transmission of chloroquine-resistant *P. falciparum*."

"Information on the gametocytocidal and sporontocidal effect of primaquine on strains of *P. falciparum* resistant to 4-aminoquinolines is limited. Further study of 8-aminoquinolines and compounds with similar activity should be encouraged and supported."

A subsequent report of a WHO Expert Committee*, after reviewing the position makes the following recommendations:

"The WHO Expert Committee on Malaria considering the available information on the distribution, degree and other aspects of resistance of *P. falciparum* to 4-aminoquinolines, and

Believing that although at present this resistance has not created serious problems for malaria eradication programmes it may nevertheless interfere with such programmes in proportion to their dependence on the use of drugs,

Recommends

(a) that more information be gathered in different parts of the world on the subject of the response of malaria parasites to various drugs and particularly to 4-aminoquinolines, and

(b) that the field test for assessment of drug resistance proposed by the WHO Scientific Group on Chemotherapy of Malaria be adopted with strict adherence to the correct procedure."

1.49. The Committee note that one of the factors that retarded spraying operations under the National Malaria Eradication Programme was the belated supply of insecticides. The representatives of Government attributed this belated supply to the "late arrival of

*Fourteenth Report of WHO Expert Committee on Malaria (1968)—WHO Technical Report series 382.

imports" and "difficulties in finalising deals with foreign firms" and pleaded that advance orders could not be placed due to "difficulties ... about budget allocation and getting clearance from Finance to place orders in advance." The Committee observe that advance indents are now being placed for insecticides required for the programme.

1.50. The data furnished to the Committee show that every year since 1964-65 it took anything from 7 months to 2 years for supplies of insecticides to materialise, after proposals for their purchase were mooted. It is a matter of regret that it took Government such a long time to become alive to this situation and start the procedure of placing advance orders. The Committee hope that adequate care would be taken to ensure that "administrative bottlenecks" do not interfere with the timely supply of insecticides to the operational areas. As pointed out by the WHO Expert Committee, whenever a country decides to undertake malaria eradication, funds should be "budgeted for the whole programme, available at the planned date and be managed with necessary flexibility." The Committee would also like it to be considered whether buffer stocks of insecticides would help to ease any difficulty caused by unexpected delays in transit or supplies.

1.51. The information furnished by Government to the Committee shows that the country has, between 1964-65 and 1968-69, spent Rs. 1,067 lakhs on imports of insecticides and anti-malarial drugs. The projected requirements of insecticides over the five years ending 1972-73 is 58,524 tons, out of which only 25,464 tons, i.e., less than half is expected to be indigenously available. Similarly, against the requirements of 720 million tablets of chloroquine amodiaquine over the next five years indigenous procurement on present indications would be possible only to the extent of 50 million tablets a year, there being no indigenous production to meet the estimated demand of 70 million tablets of primaquine. This situation underlines the urgent need for Ministry of Health, in consultation with Directorate-General of Technical Development, to explore the scope for increasing/establishing indigenous production of insecticides and anti-malarial drugs. The Committee would like a plan of action to be drawn up for this purpose immediately.

1.52. While drawing up a plan of action for expanding indigenous production of insecticides and drugs, the Committee would like Government to bear in mind two important considerations. The first arises out of the health hazard posed by use of DDT which has led to its being banned in some countries of the World. The Committee would like Government to initiate immediately detailed studies in

this regard. These studies should include the use of DDT for malaria eradication as well as a pesticide in agricultural operations. The second consideration has a bearing on reports of resistance of malaria parasites to drugs like chloroquine, primaquine and amminoquinolines which are being used in the country at present and are largely imported. The WHO Expert Committee have suggested that more data should be collected in this regard in different parts of the World through field tests. The Committee would like the Ministry of Health to draw up in collaboration with CSIR a programme to collect baseline data in the field about the presence of drug resistance and its distribution. The programme should also seek to secure an empirical screenings of existing chemical compounds and thorough study of relevant physiological and biochemical phenomena to evolve new drugs, if possible, which would be effective against resistant strains.

(iv) Problem of vector resistance to insecticides

1.53. A reference has been made earlier in the report to the problem of insecticides resistance encountered in the programme. The Committee enquired when susceptibility tests in this regard were carried out and what remedial measures were initiated by Government as a result of these studies. The position in this regard as gleaned from the data furnished to the Committee is as under:

"Small pockets of resistance to DDT in vector mosquito *A. culicifacies* were found in Gujarat as early as 1959. Detailed systematic studies were carried out in many parts of the country. Now it is confirmed that there are more pockets of resistance in *A. culicifacies* and *A. stephensi* in the country as detailed below.

The Maharashtra and Gujarat where vector is resistant to both DDT and BHC it is proposed to use alternate insecticide. Trials with Malathion and Sumithion are being undertaken.

<i>Vector</i>	<i>Resistant to Insecticide</i>	<i>Area</i>	<i>Year in which discovered</i>
<i>A. culicifacies</i>	DDT	Maharashtra	1959
		Gujarat	1959
		Madhya Pradesh	1961
		Rajasthan	1961

	BHC	Maharashtra	1867and
		Gujarat	1967
			1964
<i>A. stephensi</i>	DDT	Madras	1960
		Gujarat	1966
		Rajasthan	1966
		Andhra	
		Pradesh	1964

1.54. The remedial measures taken in the light of this position have been described in a note submitted to the Committee as under:

“Among the important malaria vectors, only two species viz., *A. Culicifacies* and *A. Stephensi* are resistant to insecticides in use i.e. DDT and BHC. The other vectors are still susceptible. By increasing spray rounds in areas where the resistance in *A. Culicifacies* was noted, it was possible in some instances to check malaria transmission. However, in one instance in Maharashtra where *A. Culicifacies* is highly resistant to DDT and BHC even with a very good spray coverage both in quality and quantity, malaria transmission could not be checked. To overcome this resistance, an alternate insecticide Malathion (Organophosphorous) is being tried out.

In urban areas where *A. Stephensi* is Vector and it is resistant to insecticides in use, intensive antilarval measures are undertaken to tackle the problem. The measures include judicious use of oil, treatment of wells with lead free petrol and Paris Green. Biological control by way of the use of fish (*Gambusia affinis*) is also practised.”

1.55. Outlining the strategy developed to counter insecticide resistance, the representative of the Ministry of Health stated before the Committee:

“The moment the mosquitoes become immune to one insecticide we quickly switch over the other insecticide and start a massive attack on them because with quick action they will get eliminated and they would not become immune to the second insecticide; if the operation is haphazardly done or not properly done in a very massive manner, then they become resistant to the second insecticide; when that happens we switch over to the third insecticide and so on. Apart from BHC and malathion

we have a few other insecticides to which the mosquitoes have not yet become resistant and they are being employed; . . . in Gujarat, Maharashtra etc. where they have become resistant to DDT we employ the other insecticides."

It was added that malathion, one of the new drugs being used "is 16 times costlier than DDT. So there are certain limitations on the extent to which we can use it."

1.56. The Committee observe that various expert committees of W.H.O. have, from time to time, considered the problem of insecticide resistance. The following are some of the suggestions that have been made:

- (i) Larvicidal techniques (i.e., attack on larvae) may be needed to supplement or replace imagicidal attack (i.e., attack on insects at adult stages through insecticides) in areas where "well conducted imagicidal attack does not produce a satisfactory result." (14th Report of WHO Expert Committee).
- (ii) Mass drug administration may "significantly speed up the success of an insecticidal attack" in programmes "in which insecticides have failed or may fail", though for operational reasons (due to problems of staffing, identification of individuals, population attitudes and beliefs, organisation etc.) as well as technical reason (such as problems arising out of frequency of administration, coverage of population, toxicity and side-effects) "wide application of such measures is not called for."

1.57. Earlier in this report, the Committee have drawn attention to the problem of resistance on the part of Malaria-transmitting Mosquitoes to insecticides and to the disturbing implications of this phenomenon for the future of the programme, both in terms of cost and speed of implementation. The Committee would like Government not to lose further time and to establish, through thorough entomological investigations, the causes of persisting transmission in areas where insecticide resistance has developed. In particular, the investigations should seek to ascertain whether persisting transmission is in any way due to what the W.H.O. Expert Committee have characterised as the "presence of unsuspected vector species, not effectively controlled by insecticides." A plan of action for controlling and interrupting transmission in those areas should also be drawn up,

having regard to suggestions made by W.H.O. Expert Committee from time to time, due consideration being given to the following measures, subject to operational conditions:

- (i) Supplementing insecticidal attack by larvicidal operations.
- (ii) Mass drug administration.

1.58. It appears to the Committee that till a solution can be found to this problem a concerted campaign against the aquatic stages of the mosquito i.e. larval and pupa stages will have to be intensified.

1.59. It will also be necessary for Government to undertake entomological investigations to determine how best the breeding of malarial mosquitoes could be checked so that their multiplication is effectively arrested.

(v) Personnel problems in the scheme

1.60. According to information furnished to the Committee, the National Malaria Eradication Programme employs the following staff:

<i>Organisation</i>	<i>Number employed</i>
I. Directorate of NMEP and RCO	342
II. State Headquarters in 17 states and 10 Unions Territories.	800
to supervise, plan and direct the operations at Central and State level.	
<i>III. N.M.E.P. Units.</i>	
Medical Officers	393
A.U.O. (Non-Medical)*	400
Malaria Inspectors (Health Inspectors)	3150
Surveillance Inspectors	11790
Surveillance Workers	47160
Laboratory Technicians	4000
Total	68035

Besides there are nearly 16,000 other workers under N.M.E.P. which includes ministerial staff, drivers, mechanics, field workers attached with each unit.

The units also employ temporary labour during spray season to conduct the operation. The number of labourers varies from 70,000 to 75,000 depending on the period of operations. Thus the total man-power employed under NMFP varies from 1,50,000 to 1,60,000."

1.61. The operational cost of the scheme during the period 1958-59 to 1967-68 amounted to Rs. 95.37 crores (not including the cost of Central Establishment and expenditure on WHO Organisation borne by Government amounting to Rs. 1.45 crores). The Committee enquired what the constituent items of the operational cost were. The witness stated that "it relates to staff and contingencies." In reply to a question whether there are norms for staffing pattern fixed after Works Studies, he added: "Before this programme was introduced there was the Malaria Control Programme. At that time various norms were suggested and they were tried out. . . . A constant check was maintained to find out what would be the best norm for one unit comprising about 1½ million population. . . . In the field visits to various areas, a study was made of the needs of each unit." The Committee observe in this connection from information furnished to them that in the course of discussions held by officials of the Ministry of Health with one of the officials of the WHO, a view was expressed by one of the officials "who possesses intimate background of Indian problems" that the cost of "present surveillance machinery for detection of malaria cases and remedial measures is very expensive" and that "there should be some further researches to simplify the methods of detection of cases."

1.62. The Committee enquired whether the personnel who do the spraying in the first phase are drafted on for surveillance work. The witness stated: "Spraying staff is temporary and seasonal, only for five months in a year." Asked whether security of service for them was not essential, the witness informed the Committee that "the programme itself is temporary. Therefore, all of them cannot be absorbed." It was added: "But for a small quantum of staff which we engage on seasonal basis the rest of the staff in the various phases are assured of employment. We are giving them orientation training to enable them to fit into our basic health services where they have to do many other activities."

1.63. The Committee pointed out that "low morale" of the staff had been given as one of the reasons for whatever failure had occurred in the scheme. The witness replied: "What we meant by low morale was this. Our teams had gone to various States; for various reasons, the people are there but the programme is not being executed, and we cannot take disciplinary action against certain people if they have failed to come or do the spraying operation or if they had made fictitious entries in the return that they had sprayed so many houses and so on. We have detected some of these, but some corrective has to be there, and that corrective has to be some sort of a disciplinary action. It is not possible to transfer these people from one area to another for various reasons; they have got so much influence locally. The people are there; insecticides are there, everything is available. We have repeatedly brought this to the notice of the States where there is hardly anything lacking except doing it. That is where we have difficulties." Asked what action was taken in respect of cases of this type, the witness informed the Committee as follows:

"This has been brought to the notice of the State Governments right from the level of Ministers to the Directors of Health Services—not all States, but some. We have been very energetic at it, but then ultimately the execution rests with the State Governments. Ours is a federal structure. . . . Whenever our team goes into the fields and finds out loopholes and draw-backs in the programme, we do point this out to the State Governments. We do not tell them that people should be transferred because we see only one place or two places and it will be wrong for us to jump to conclusions on that basis. But we do point out to them all the defects. In the last few months, we have been studying the position in Gujarat, Orissa and Madhya Pradesh. We do find that in certain areas in respect of certain matters there is complete failure of the programme and we tell them and request them to see that these things do not recur. We wait till our next visit to see whether the things have been set right or not."

1.64. The Committee enquired whether the temporary status of the staff was responsible for this situation. The witness replied: "I do not think so. After all, the work is given to them and those who are doing it will be absorbed in due course, if they do it well. I do not think that by itself is the reason. And they have agreed to work on these conditions."

1.65. The Thirteenth Report (1967) of the WHO Expert Committee which reviewed the problems of personnel and training contains the following observations:

"A major factor affecting the progress of malaria eradication programmes is the availability of competent, adequately trained personnel. Competent leadership and personnel, a high *esprit de corps*, and adequate funds, constitute the foundations on which an organisation is built. The human element is thus of the greatest importance. Competent personnel need to be available in sufficient numbers. They should have the knowledge required to perform their duties and they should have the necessary interest, experience and discipline in order that their knowledge may be effectively applied. Deficiencies in one or more of these aspects have militated against the success of a number of programmes."

"In a number of cases, even though staff may originally have been provided in adequate numbers, programmes have suffered from an excessive turnover resulting from unsatisfactory conditions of service and lack of interest. *Esprit de corps* is important in achieving success and depends on motivation, on conditions of service, and on the future prospects of the staff. Good supervision and enthusiastic leadership are key factors for success and generate in the staff pride in belonging to an organisation that is appreciated and is doing a successful humanitarian work. Programmes have flagged where personnel do not have the feeling that they are part of an efficient public service and are performing an important job with the clear goal of eliminating the last case of malaria from the area."

"In relation to prospects for the future, it has been found that it is not sufficient for these to relate merely to the duration of the malaria eradication programme; there must also be assurance of continued service in the field of public health. Where the staff know that there will be this continuity of public health work, their enthusiasm is maintained. Where this has been forgotten, it has often been the cause of deterioration in malaria eradication programmes at the critical stage of the consolidation phase when particularly exacting and careful work is required. Furthermore, should the staff feel that there is no future for them beyond the eradication programme, it is natural that little effort will be made to hasten its successful termination and the consequent end of employment. For these reasons, also, it is

very desirable for there to be the closest co-operation between the malaria service and the general health service from the outset of the programme."

1.66. The National Malaria Eradication Programme employs a substantial complement of staff. The total expenditure on this account, including contingent expenditure, amounted to Rs. 95.37 crores during the period 1958-59 to 1967-68. The Committee would like Government to examine whether, consistent with the need to secure effective implementation of the scheme, there is scope for economy. A works or norms study could be conducted for this purpose.

1.67. From the information furnished by Government, the Committee gather the impression that the present surveillance machinery for detection of malaria cases is "very expensive". The Committee would like Government seriously to undertake research studies to simplify methods of detection and bring down the cost in this regard.

1.68. One of the personnel problems that Government are faced with is the "low morale" which would appear to have seriously interfered with the successful implementation of the programme. The representatives of Government also pointed out that there had been instances of "the programme . . . not being executed" by the staff or "fictitious entries" regarding spraying in certain areas resulting in "complete failure of the programme in respect of certain matters." The Committee would like the Government of India in consultation with the States to draw up a plan for stringent action to deal with cases of dereliction or delinquency. For this purpose a systematic record of such occurrences may prove useful and have a salutary effect on the workers. At the same time, the Committee would like Government to appreciate that lack of assured career prospects could greatly dampen morale and lead to neglect and inefficiency, As pointed out by the W.H.O. Expert Committee, a number of programmes "have suffered from an excessive turnover resulting from unsatisfactory conditions of service and lack of interest." The Committee would like Government to consider how best the scope for absorption of temporary or seasonal staff could be maximised through training programme calculated to equip them for diverse work in the general health services. The aim should be to assure each employee a reasonable service prospect unless found guilty of incompetence, neglect, dishonesty or other justifiable cause for dismissal.

1.69. The work of the spraying staff employed in the Scheme involves health hazards arising out of exposure to insecticides. The Committee would like Government to take adequate steps to protect the staff against such hazards. Their area of work should also be mapped out in such a way as to avoid undue burden or inconvenience.

(vi) Problems of transportation

1.70. The Committee was informed during evidence that supply of insecticides etc. was "hampered due to transport difficulty." The Committee enquired whether there was any difficulty on account of non-availability of wagons. The witness stated: "We have been experiencing difficulty about rail wagons and we have taken up the matter with the Railway and I am told they have given a higher priority, next to food. So, we hope there will be no difficulty now."

1.71. Taking up the question of road transport, the Committee enquired whose responsibility it was to maintain the fleet of vehicles with the National Malaria Eradication Programme. It was stated that this was the responsibility of the States. The Committee drew the attention of the witness to the following observations of the Public Accounts Committee (1968-69) in their Seventy-First Report (Fourth Lok Sabha):

"The Committee are not very happy about the position in regard to the utilisation of vehicles placed at the disposal of the States for the implementation of the National Malaria Eradication Programme. The information furnished by Government shows that nearly 50 per cent of the fleet of 2,653 vehicles is off the road. The Committee had occasion to comment on the unsatisfactory maintenance and upkeep of these vehicles in para 2.72 of their 42nd Report (Third Lok Sabha). It is a matter for regret that, despite the creation of an organisation to improve the situation, the position has actually deteriorated."

The witness stated that a Committee had been appointed to examine how many of the vehicles could be made road-worthy.

1.72. The Committee enquired what exactly was the role of the Central Health Transport Organisation in the Ministry of Health. In this connection they drew attention to the observation of the P.A.C. in their Seventy-First Report (Fourth Lok Sabha):

"The Committee observe that the Central Health Transport Organisation set up in the Ministry of Health and Urban Development is meant to function largely as a service agency to simi-

lar organisations already set up in the various States. Most of the duties entrusted to this Organisation are of a nature that the State Organisations could themselves discharge, with suitable assistance from the Transport Organisations that exist in the States. The Committee would like Government to examine whether a full-fledged organisation of this nature at the Central level is at all necessary."

The witness replied: "It is on the basis of this recommendation primarily that the thinking has been that the functions of the Central Health Transport Organisation should be only in respect of training of staff, who go out in the field and train the staff of the State Transport Organisations and in respect of procurement of such spare parts which could best be procured by the Central Organisation."

1.73 The Committee note from the information furnished that the requirements of vehicles for the programme has been estimated as 1987 as follows:

(i) For attack and consolidation phases @ 7 vehicles per unit	1274
(ii) For maintenance units @ 3 vehicles per unit	630
(iii) Regional Co-ordinating Officer and State Headquarters	83
	1987

The road-worthy vehicles available have been estimated as 1483 leaving a shortage of 504 vehicles. The vehicles required on replacement account has been estimated as 1483, making a total of 1987 vehicles to be procured on the following programme:

1969-70	1245
1970-71	
1971-72	371
	198

1.74. In their 42nd Report (Third Lok Sabha) as well as their 71st Report (Fourth Lok Sabha), the Committee have drawn attention to the unsatisfactory position regarding deployment of vehicles placed at the disposal of the States for the implementation of the National Malaria Eradication Programme. The Committee had then drawn attention to the fact that nearly 50 per cent of the existing fleet of 2,653 vehicles was off the road. Basically the very poor quality of maintenance of the vehicle fleet has strained their efficiency and life and interfered with their optimum utilisation. The Committee note that pursuant to their suggestions in their earlier Reports, a committee has been set up to examine how many vehicles out of the existing fleet could be rendered road-worthy. The Committee hope that this examination would be speedily completed and that, before any proposal for augmentation of the fleet is approved, the scope for pressing into service the maximum number of vehicles out of the existing fleet would be carefully examined, taking into account the economics of their repairs.

1.75. From the information furnished to the Committee, it is observed that there is a plan for purchase of 1,987 vehicles for the period ending 1971-72. The Committee have, in their 97th Report (Fourth Lok Sabha) report, pointed out the desirability of phasing the programme of purchase of vehicles as and when they became road unworthy instead of deferring it over years. The Committee would also like Government to scrutinise this requirement very critically and ensure that only the minimum number of vehicles required by operational areas are purchased, purchases for co-ordinating and headquarters organisations being avoided as far as possible.

(vii) Miscellaneous

(a) *Border Areas:*

1.76. The Committee enquired about the progress of the Malaria Eradication Programme in border areas. They pointed out that in a border State like Jammu and Kashmir, there should be adequate safeguards to prevent importation of malaria from the other side where the scheme might not have progressed so well. The witness stated:

"It is not so much the mosquitoes which may come into our country as the cases coming from Pakistan and crossing over to our country which are important from this point of view. The mosquitoes feed on the blood of those cases with active malaria and then they get infected. So, we are much more

worried about our Indian breed of mosquitoes getting infected with malarial parasites because of this movement of malaria cases."

The Committee asked whether the good offices of WHO could not be availed of to prevent cross-movement of malaria cases. The witness replied:

"In these border areas, because of these very considerations, we have kept the area under attack phase all the time; the area is being sprayed with DDT constantly, and it will continue to remain so till we find that on the other side of the border also, the disease has disappeared or at least reduced very much, and, therefore the risk will not be there. We have Border meetings also arranged through the good offices of the WHO."

(b) *Problem Areas*

1.77. The Committee asked whether there had been any resistance on the part of local population to the scheme as was the case with the anti-locust campaign. The witness replied in the affirmative and stated in Kutch-Bhuj area such attitudes had been encountered.

1.78. The Committee wanted to know whether there were any areas in which malaria continued to be a persistent problem. The witness stated that "there are as many as 40 unit areas where it still continues to be a problem. They are receiving our special attention." The Fourteenth Report of the Expert Committee on WHO (1968) which considered the problem of persistence of malaria in certain areas made the following observations:

".....full investigation of some areas with technical problems, possibly representative of a group of similar area, remains advisable. In most cases, simpler investigations would indicate the main causes responsible for persistence of transmission. Such causes may be grouped as follows:

- (a) factors related to human ecology and ethnology;
- (b) survival of the vectors despite insecticidal attack, due to:
 - (i) insecticide resistance
 - (ii) refractory behaviour towards the insecticide
 - (iii) inactivation of the deposit through sorption, rubbing, etc.;

- (c) presence of an unsuspected vector species, not effectively controlled by the insecticide;
- (d) drug resistance of the parasites (although chloroquine resistance increases the difficulties, no area in which it has constituted a technical problem has been described till now)."

The Expert Committee recommended that "vigorous steps be taken to investigate and if possible eliminate persistent transmission by carefully reviewing all aspects of the programme, with particular attention to effective attack measures and thorough case detection."

(c) *Over-payment of Surveillance allowance in Orissa*

1.79. The Committee drew attention to the observations in the Audit paragraph regarding payment of a sum of Rs. 6.32 lakhs to surveillance workers in Orissa though they were not entitled to it. The witness stated that the Government of India had already written to the State Government: He added: "They have replied to us. But the reply is not satisfactory. We are still in correspondence with them. We are pursuing it." Asked whether payment of the allowance had been stopped, he said that the reply of the State Government indicated that "this allowance is given in hilly and forest areas. We are not quite sure whether they have stopped it and what the exact position is. We are still in correspondence with them."

(d) *Loss of DDT and anti-malarial drugs in transit*

1.80. The Committee invited the attention of the witness to the observations in the Audit paragraph about transit losses of DDT and anti-malarial drugs amounting to Rs. 1.98 lakhs. Explaining the position, the witness stated:

"To put the whole thing very clearly, I say that over a period of ten years, the total goods involved were Rs. 57.80 crores which had been moved of which the losses reported were Rs. 2.73 lakhs—much less than .04 per cent. Of this Rs. 1.62 lakhs has been recovered already. Only Rs. 1.11 lakhs has to be recovered. This is much less compared to the goods moved viz., Rs. 57.80 crores.

As regards the practical side of it I should say that these goods are sent to the State Governments on Freight to Pay basis. If there is any shortage in transit of these goods, it is

for them to claim from Railways. As regards the losses, the very fact that recoveries are made show that the State Governments are also approaching the railways from time to time to make good the losses. We have also approached and written to the Railways in this regard. Naturally, we are not in a position to give them the details about the consignments and their losses. But, looking to the fact that this is being pursued, we hope that these losses would further be reduced."

1.81. In reply to further questions, the witness added: "The primary responsibility to make out a claim lies with the State Governments. We are pursuing with them."

1.82. The Committee would like constant vigil to be maintained in border areas for controlling malaria. The good offices of the WHO should be availed of in deciding the phasing of the programme in these areas.

1.83. The Committee are concerned to observe that there are about 40 problem areas in the country where transmission of malaria persists. The Expert Committee of WHO have laid down guidelines for implementation of the scheme in such areas, which Government will no doubt duly take note of. In particular, attention should be directed to "effective attack measures and thorough case investigation" so that persistence of transmission could be eliminated.

1.84. The Committee note that an overpayment of a sum of Rs. 6.32 lakhs to surveillance workers by way of allowances, occurred in the State of Orissa between 1962-63 and 1966-67. Government have stated that the matter is under investigation in consultation with the State Government. The Committee would like to be apprised of the findings. In case an overpayment is established, appropriate steps for recovery should be speedily taken.

1.85. The Committee observe that claims for transit losses amounting to Rs. 1.11 lakhs in respect of DDT and anti-malarial drugs sent by rail have still to be realized. The Committee would like the matter to be pursued further and recoveries effected.

(e) General

1.86. Malaria is one of the most widespread diseases. Its existence depends on two factors, the mosquito capable of transmitting the parasite and the humans harbouring the parasite in the blood. It can be controlled effectively only when measures are simultaneously applied against the mosquito and the infection present in a human being.

1.87. Over the years, Government have made a substantial investment in the National Malaria Eradication Programme. The data given earlier in this report would show that between 1958-59 and 1967-68, the investment amounted to Rs. 154.64 crores, a little over one-fifth of this investment involving expenditure in foreign exchange. The investment in the scheme amounts to 12.72 per cent of the total Central and State health budget. Government have, therefore, a vital stake in the scheme and its successful implementation is of paramount importance.

1.88. The findings in this report will show that, while the scheme progressed satisfactorily till 1963-64, set-backs have occurred since then with focal outbreaks of malaria in a number of States. In the result the completion of the programme has been delayed by over six years. The outlay for completion of the scheme has in consequence undergone an enhancement from Rs. 19.21 crores to Rs. 91.74 crores.

1.89. Though this situation has been brought about by a variety of reasons, the principal contributory factors that affected the progress of the operations were these:

- (i) Failure to ensure that spraying coverage was total, complete, sufficient and regular.
- (ii) Absence of timely provision of staff at certain levels, particularly at diagnostic centres and of insecticides and anti-malarial drugs.
- (iii) Inadequate emphasis on surveillance techniques.
- (iv) Failure to develop a sound health infrastructure in the field to take over the scheme at the consolidation stage.

1.90. The Committee have made suggestion earlier in this report to overcome these deficiencies. They trust that Government would take speedy implemental action thereon. As early as 1960 the TCM Malaria consultants summed up the essence of the strategy for the successful implementation the programme in the country in the following words:

"The team is convinced that the future of Malaria Eradication in India is dependent almost entirely on the ability of the individual spraymen and the individual surveillance

worker to carry out the duties in an acceptable manner and to his supervisors to provide the leadership and directions of eradication activities."

NEW DELHI;
January 22, 1970

Magha 2, 1891 (Saka)

ATAL BIHARI VAJPAYEE,
Chairman,
Public Accounts Committee.

APPENDIX I

(Ref. Paragraph 1.11)

STATEMENT—A

*National Malaria Eradication Programme—India
Phasing in respect of States without reversions*

In 10 States with a total of 251.92 units there have been 71.35 units reverted back to Attack phase (51.785 from Consolidation and 19.53 from Maintenance).

Sl. No.	State	No. of units	ATTACK PHASE				Control phase	Maintenance
			Reverted from			Total		
			Main- ance	Consoli- dation	Exist			
1.	Assam	13.25	—	1.57	4.07	5.64	5.12	2.49
2.	Bihar	42.00	—	2.625	1.54	4.165	10.005	27.78
3.	Gujarat	19.50	2.12	13.02	4.36	19.50	—	—
4.	Haryana	6.50	0.77	0.06	—	0.83	1.12	4.55
5.	Madhya Pradesh	29.00	2.00	15.24	8.51	25.75	3.25	—
6.	Maharashtra	33.00	—	6.19	1.67	7.86	10.33	14.81
7.	Orissa	15.00	—	0.20	6.18	6.38	6.23	2.39
8.	Punjab	10.00	1.62	0.25	—	1.87	0.10	8.03
9.	Rajasthan	16.67	4.52	6.69	1.81	13.02	1.00	2.65
10.	Uttar Pradesh	67.00	8.50	5.94	4.28	18.72	5.51	42.77
TOTAL		251.92	19.53	51.785	32.46	103.735	42.715	105.47

STATEMENT—B

National Malaria Eradication Programme—India
Phasing in respect of States with reversions

In the other 7 states, 8 Union Territories and 3 special entitles with a total of 141.33 units there have been no reversions.

S. No.	State	No. of units	Attack	Consolidation	Maintenance
1.	Andhra Pradesh	33.50	2.44	9.44	21.62
2.	Jammu & Kashmir	3.25	0.09	1.66	1.50
3.	Kerala	14.30	—	—	14.50
4.	Madras	31.45	—	2.70	28.75
5.	Mysore	19.13	0.12	4.17	14.84
6.	West Bengal	26.00	1.56	5.92	18.52
7.	Andaman & Nicobar	0.25	0.25	—	—
8.	Bhutan	1.00	1.00	—	—
9.	Chandigarh	0.10	—	—	0.10
10.	Coalfields	1.00	0.02	0.18	0.80
11.	Delhi	2.00	—	0.50	1.50
12.	Goa	0.50	—	0.50	—
13.	Himachal Pradesh	2.65	0.02	0.35	2.28
14.	Manipur	2.00	0.25	1.75	—
15.	Nagaland	1.00	1.00	—	—
16.	N. E. F. A.	1.50	1.50	—	—
17.	Sikkim	0.50	—	0.50	—
18.	Tripura	1.00	1.00	—	—
TOTAL		141.33	9.25	27.67	104.41

APPENDIX II

(Rf. Paragraph 1.19)

Recommendations of Annual Independent Appraisal Teams from 1965 to 1969 and action taken thereon

Year 1	Recommendation of I.A.T. No. of unit areas recommended for entry into		No. & dates under which the recom- mendations were forwarded by Govt. of India to different States	Implementation
	Cons. Phase 2	Maint Phase 3	4	5
1965-66	25.00	64.01	<ol style="list-style-type: none"> 1. F. 8-27/65-C&CD dated 6th April, 1965 regarding entry into Consolidation phase. 1. F. 8-27/65-C&CD dated 11.3.1965 regarding entry into Maintenance phase. 	<p style="text-align: center;"><i>Spray withdrawn & entry to consolidation phase.</i></p> <p>All the States implemented the recommendations of the I.A.T. and spray operations were withdrawn from 25.00 unit areas from various States. As to the specific technical observations made by the I.A.T the State Govts. instructed the unit Officers concerned to carry out the recommendations. The Zonal and State headquarters & RCOs also helped in implementing the observations. The implementation of the recommendations of I.A.T. regarding filling up of vacant posts & maintenance of vehicles were considerably delayed due to administrative difficulties. As to the other recommendations regarding augmentation of the laboratory staff & increasing of emoluments these were not implemented due to administrative & financial consideration.</p> <p style="text-align: center;"><i>For entry into Maintenance phase</i></p> <p>The recommendations of I.A.T. for entry of 64.01 unit areas in different States were strictly subject to the condition of implementation of recommendations of the Special Committee popularly known as Chadha Committee appointed by the Govt. of India for preparation to be made for entry of units into maintenance phase. The entry of units into maintenance phase in various States were considerably delayed for want of the infra structure as recommended by Chadha Committee. 1.00 unit areas in Kerala and 9.25 in Madras, however,</p>

1

2

3

4

5

entered Maintenance phase as per schedule with effect from 1st April, 1965. In respect of other States the entry was delayed from 3 to 8 months. The staff in most of the States was provided as per recommendations of Chadha Committee except in Bihar and Uttar Pradesh.

In Bihar, Basic Health Workers were provided @1 per 20 to 25 thousand population as against 1 for 10,000 as recommended by the Chadha Committee. For supervision over Basic Health Workers, the Chadha Committee recommended Family Planning Health Assistants @one per 6 to 7 blocks and Health Supervisions @2 per-District. No such staff was provided in Bihar.

In Uttar Pradesh 7 regular Basic Health Workers were provided in addition to 1 from Zila Prishad per block irrespective of the population involved.

8

1966-67

24.41

60.68

F.8-26/66-C&CD, dated 23.3.1966

Spray withdrawal & entry into Consolidation Phase.

The recommendations were implemented by all the States and 24.41 unit areas entered Consolidation phase from 1st April, 1966. As to specific technical observations made by the I.A.T. the unit Officer concerned were instructed by the respective State Governments, to carry out the observations. The zonal, State and RCO officers also helped in the implementation of the recommendations. As to filling up of vacant posts in Punjab there was considerable delay due to administration reason. Regarding increasing of laboratory staff in Andhra Pradesh this could not be implemented due to financial stringency.

For entry into Maintenance phase.

As in the previous year the entry of units into maintenance phase were subject to implementation of recommenda-

tion of Chadha Committee. For want of the required infrastructure, the entry of unit areas into Maintenance phase were considerably delayed in most of the States. 4.50 units in Madras entered as per schedule. The entry in respect of remaining 52.06 unit areas in various States were delayed from 1 to 14 months. The 2.14 unit areas in Assam and 2.00 in Madhya Pradesh could not enter Maintenance phase. The staff was provided more or less as per recommendations of Special Committee in all States, except Bihar and Uttar Pradesh as already indicated. Further the Family Planning Health Assistants provided for supervision over Basic Health Workers were withdrawn on the recommendations of the Mukherjee Committee on Family Planning

1967-68

11.30

24.65

F.8-74/67-C&CD dated 2.6.1967

Spray withdrawal ? entry into Consolidation Phase.

All the State implemented the recommendations of I.A.T. and spray operations were withdrawn for 11.30 unit areas during 1967-68. As to the specific technical observation made by the I.A.T. the State Govt. instructed the Unit Officer concerned to carry out the recommendation. The Zonal and State Headquarters & RCO's also helped in implementing the observations. As to augmentation of laboratory staff on the basis of 1 per 100,000 population, no specific information has been received from the States. It is, however, understood that this recommendation of the I.A.T. has not been implemented due to administration reason. No action could be taken on filling up of vacant posts (particularly of Surveillance staff) in Rajasthan due to ban imposed by the State Govt. while in other State there was considerable delay due to administration difficulties.

For entry into Maintenance phase.

The recommendation of I.A.T. were subject to the implementation to the recommendation of the Mukherjee Committee on Basic Health Services. The Mukherjee Committee report has not so far been approved by the Govt. of India. The entry of units into maintenance phase

1	2	3	4	5
1968-69	2.95	1.52	F.8-131/67-C&CD dated 18.7.1968	<p>were delayed as usual in most of the States and out of 24.65 unit areas recommended, 10.87, unit areas in the State of Jammu & Kashmir, Haryana, Mysore, Orissa Punjab, Uttar Pradesh, Himachal Pradesh & Coalfields could enter maintenance phase. The Jammu & Kashmir, Haryana and Orissa provided the staff in the maintenance phase areas as per recommendation of Mukherjee Committee. The other States however provided staff more or less according to Chadha Committee. With the withdrawal of F.P.H. As. as indicated earlier, the supervisory tier of Basic Health Workers was missing in most of States.</p> <p><i>Spray withdrawal and entry into Consolidation phase.</i></p> <p>All the States implemented the recommendations of I.A.T. and spray operations were withdrawn from 2.95 unit areas during 1968-69. As to the specific technical observations made by the I.A.T. the State Governments instructed the unit officer concerned to carry out the recommendations. The Zonal and State headquarters & RCO's also helped in implementing the observations. The vacant posts in Rajasthan could not be filled in due to Govt. ban in filling up the vacant posts.</p> <p><i>For entry into maintenance phase.</i></p> <p>The recommendations of I.A.T. were subject to the implementation to the recommendations of the Mukherjee Committee on B.H. Service. The Mukherjee Committee Report has not been approved by the Govt. of India. The entry of units into maintenance phase were delayed as usual, in most of the States and out of 1.52 unit areas recommended, 0.10 have entered the Maintenance phase so far.</p>
1969-70	0.764	5.11	The Recommendations are being examined.	

S. No.	DEFECTS	NUMBER OF UNITS						
		Andhra Pradesh	Assam	Bihar	Gujarat	Haryana	Jammu & Kashmir	Ke
1	<i>Unsatisfactory Spraying :</i>							
	(i) Consolidation phase	1	1	..	..	..	..	..
	(ii) Maintenance phase . . . .	..	..	..	..	..	..	..
2	<i>Poor surveillance :</i>							
	(i) Consolidation phase . . . .	..	2	4	3	..	..	..
	(ii) Maintenance phase: . . . .	..	..	5	5	..	..	..
3	<i>Inadequate staff; Laboratory facilities :</i>							
	(i) Consolidation phase . . . .	..	1	1	1	..	..	..
	(ii) Maintenance phase	2	..	..	2	..	..	..
4	<i>Defective blood smearing/ Delay in blood examination :</i>							
	(i) Consolidation phase	1	..	4	1	..	..	..
	(ii) Maintenance phase . . . .	..	..	1	..	..	..	..
5	<i>Lack of Epidemiological investigation</i>							
	(i) Consolidation phase . . . .	..	..	..	1	1	..	..
	(ii) Maintenance phase . . . .	..	..	..	..	..	..	..

APPENDIX III

(Ref: Paragraph 1.19)

Statement showing the main Defects Noticed by the Independent Appraisal Teams in the Implementation of the N.M.E.P. and the number of units in various States in which these Defects were noticed during the years 1965 to 1969.

1965

NUMBER OF UNITS IN WHICH THE DEFECTS WERE NOTICED IN

Sl. No.	DEFECTS	Andhra Pradesh	Assam	Bihar	Gujarat	Haryana	Jammu & Kashmir	Kerala	Madhya Pradesh	Maharashtra	Mysore	Orissa	Punjab	Rajasthan	Tamil Nadu	Uttar Pradesh	West Bengal	Delhi	Goa	Himachal Pradesh	Manipur	
1.	Unsatisfactory Spraying:																					
	(i) Consolidation phase	1	1	3	..	..	1	..	1	2	1	1	2	2	..	3	..	1	..	..	..	1
	(ii) Maintenance phase	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
2.	Poor surveillance:																					
	(i) Consolidation phase	2	4	6	..	..	2	..	6	5	1	1	..	1	..	3	1	..	..	..	..	..
	(ii) Maintenance phase	3	..	6	..	..	..	..	..	6	2	..	2	..	1	..	..	..	..	..	..	..
3.	Inadequate staff/Laboratory facilities:																					
	(i) Consolidation phase	3	10	4	..	..	..	..	3	4	1	1	..	1	..	..	..	..	..	..	..	..
	(ii) Maintenance phase	1	..	1	..	..	..	..	..	..	..	..	..	..	..	3	2	..	..	..	..	..
4.	Defective blood smearing/Delay in blood examination:																					
	(i) Consolidation phase	2	1	4	..	..	1	..	..	2	..	..	..	..	..	..	..	..	..	..	..	1
	(ii) Maintenance phase	..	..	1	..	..	..	..	..	1	3	..	1	..	..	3	3	..	..	..	..	..
5.	Lack of Epidemiological investigation:																					
	(i) Consolidation phase	..	..	5	..	..	..	..	..	1	2	..	1	..	1	..	..	..	..	..	..	..
	(ii) Maintenance phase	..	..	2	..	..	..	..	..	1	..	..	..	..	1	4	..	..	..	..	..	..

NUMBER OF UNITS IN WHICH THE DEFECTS WERE NOTICED IN:

DEFECTS	Andhra Pradesh	Assam	Bihar	Gujarat	Haryana	Jammu & Kashmir	Kerala	Madhya Pradesh	Maharashtra	Mysore	Orissa	Punjab	Rajasthan	Tamil Nadu	Uttar Pradesh	West Bengal	Delhi	Goa	Himachal Pradesh	Manipur	
<i>Unsatisfactory Spraying :</i>																					
(i) Consolidation phase		1	1	..	..	..	..	2	2	..	..	..	..	..	..	4	..	1	..	..
(ii) Maintenance phase	1	1	..	..	..	2	..	..	..	..
<i>Poor surveillance :</i>																					
(i) Consolidation phase	..	2	4	3	..	..	..	4	6	..	1	..	2	..	1	2	..	1	1	..
(ii) Maintenance phase	5	5	..	..	..	3	3	1	1	1	..	..	1	2	..	..	..	..
<i>Inadequate staff/Laboratory facilities :</i>																					
(i) Consolidation phase	1	1	1	..	..	..	2	..	..	..	..	..	1	..	..	..	1	..	
(ii) Maintenance phase	..	2	..	..	2	..	..	..	1	2	..	2	..	..	..	..	..	..	..	..
<i>Defective blood smearing/Delay in blood examination :</i>																					
(i) Consolidation phase	..	1	..	4	1	..	..	..	1	..	1	..	..	..	..	..	..	..	1	..
(ii) Maintenance phase	1	..	..	..	..	..	2	..	..	..	..	..	2	..	..	1	..	
<i>Lack of Epidemiological investigation.</i>																					
(i) Consolidation phase	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
(ii) Maintenance phase	1	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..

NUMBER OF UNITS IN WHICH THE DEFECTS WERE NOTICED IN :

Sl. No.	DEFECTS	Andhra Pradesh	Assam	Bihar	Gujarat	Haryana	Jammu & Kashmir	Kerala	Madhya Pradesh	Maharashtra	Madhya Pradesh	Madhya Pradesh	Orissa	Punjab	Rajasthan	Tamil Nadu	Uttar Pradesh, Bengal	West Bengal	Delhi	Goa	Himachal Pradesh	Manipur
1	Unsatisfactory Spraying :																					
	(i) Consolidation phase	1								1								1				
	(ii) Maintenance phase																					
2	Poor surveillance :																					
	(i) Consolidation phase	4	1	4																		
	(ii) Maintenance phase	5	1	2	6				3		1		1	3			2				1	
3	Inadequate staff Laboratory facilities :																					
	(i) Consolidation phase	2		1																		
	(ii) Maintenance phase	3		1	1				1			3			4			1				
4	Defective blood smearing Delay in blood examination :									1		1			3			1	1		1	
	(i) Consolidation phase	1													1		1	1				
	(ii) Maintenance phase	1		1					4			1			2				1			
5	Lack of Epidemiological investigation :																					
	(i) Consolidation phase								1		2											
	(ii) Maintenance phase		1							1					1							

NUMBER OF UNITS IN WHICH THE DEFECTS WERE NOTICED IN:

Sl. No.	DEFECTS	Andhra Pradesh	Assam	Bihar	Gujarat	Haryana	Jammu & Kashmir	Kerala	Madhya Pradesh	Mahara- shtra	Mysore	Orissa	Punjab	Rajasthan	Tamil Nadu	Uttar Pradesh	West Bengal	Delhi	Goa	Himachal Pradesh	Manipur	
1	Unsatisfactory Spraying :																					
	(i) Convolution phase		2													1						
	(ii) Maintenance phase																			1		
2	Poor surveillance :																					
	(i) Convolution phase		3									1				2						
	(ii) Maintenance phase		6																1	1		
3	Inadequate staff/Laboratory facilities :																					
	(i) Convolution phase		2									1				2						
	(ii) Maintenance phase		2							2									1			
4	Defective blood assays/Delay in blood examination :																					
	(i) Convolution phase	1	1													1						
	(ii) Maintenance phase	1																		1		
5	Lack of Epidemiological investigation :																					
	(i) Convolution phase																					
	(ii) Maintenance phase										1											

APPENDIX IV

(Ref: Paragraph 1.41)

Details of DDT and anti-malaria drugs imported from USAID During the year 1964-65 to 1968-69

Year	Quantity in Tons/ Million	Total amount spent (Rs. in lakhs)	Source of import	Date on which the proposal for procurement was sent to DGHS	Date on which re- quirement is sent to MOF (DEA)	Date on which PA/ PR is issu- ed by USAID	Date on which contract is placed with manu- facturers by US Agency	Date of receipt of material in India	Agency through which material purchased	Remarks
1	2	3	4	5	6	7	8	9	10	11
<i>DDT</i>										
1964-65	9815 Tons	184.81	USA	6.8.63	23.11.63	12.12.63	17.12.63	March-Nov. '64	GSA/ISM Washington	
<i>ANTIMALARIA DRUGS</i>										
1964-65	110 Million Chlo- roquine	23.95	USA	-do-	-do-	10.1.64	6.2.64	Feb.-June '64	-do-	
	17.04 million Pyri- methaine									
<i>DDT</i>										
1965-66	8335 Tons	146.57	USA	27.7.64	7.12.64	24.12.64	12.1.65	April-Nov. '65	-do-	

DDT

1968-69	i) 2000	305.20	USA	19-6-67	15-12-67	15-1-68	15-1-68	March-Nov. '68-	do-
	ii) 5750			14-2-67	22-3-68	28-3-68	12-4-68		
	<u>7750</u>								

ANTIMALARIA DRUGS

1968-69	Chloroquine powder for 70 million tablets	28.84	USA	5-12-67	3-1-68	28-5-68	21-6-68	Oct., '68	GAS ISM Washington
	Primaquine powder for 9 million tablets.								
	One million Pri- maquine tablets.								

APPENDIX V

Summary of main Conclusions/Recommendations

(Referred to in para 3 of Introduction)

Serial No.	Para No. of Report	Ministry/Department concerned	Conclusions/Recommendations
1	2	3	4
1	1.21	Ministry of Health, Family Planning, Works, Housing and Urban Development (Department of Health)	The Committee are perturbed over the set-back suffered by the National Malaria Eradication Programme. The Scheme, which was started in 1958-59, made satisfactory progress till 1963-64, but lost ground thereafter. The figures of positive cases detected from an examination of blood smears reflect this position. The number of cases, which was 87,306 in 1963, rose to 1,12,942 in 1964, with a marginal fall in 1965, when it was 1,00,185. The number rose again to 1,48,156 in 1966 and nearly doubled to 2,78,621 in 1967, with no appreciable reduction in the subsequent year. As a result, the programme underwent a fairly drastic re-phasing in 10 out of 17 States. 71.31 Malaria Eradication Units operating in these States and constituting well over a fourth of the total number of units were switched back to the 'attack' or preliminary phase of the programme from the 'consolidation' and 'maintenance' phases. What a major set-back this was would be apparent from the fact that the scheme which Government had expected to complete by 1968-69 would now be prolonged

till 1974-75. The outlay for completion of the scheme during the Fourth Plan period has in consequence increased from Rs. 19.21 crores, estimated in 1966, to 91.74 crores.

In the Committee's opinion, a number of deficiencies in the programme contributed to this set-back. The principal contributory factors were:

- (i) Patchy and poor spraying, resulting in what a team of T.C.M. experts had in 1960, characterised as "less-than-complete coverage of many villages and less-than-complete treatment of sprayable surfaces."
- (ii) Failure to develop on the required scale the surveillance or vigilance mechanism, which could have helped in the timely detection of persistence or recrudescence of malaria.
- (iii) Failure to provide adequate diagnostic facilities and rural health services to cope with the deteriorating epidemiological situation.

2 1.22 —D—

3 1.23 —Do—

A number of agencies who appraised the working of the scheme at various stages had drawn Government's attention to these and other weak points in the scheme. A team of TCM consultants who reviewed the working of the scheme as early as 1960 reported that "the future of malaria eradication in India is dependent almost entirely on the ability of the individual sprayers and the individual

4 1-24 Ministry of Health, Family Planning, Works, Housing & Urban Development (Department of Health)

surveillance workers to carry out his duties in an acceptable manner and to his supervisors to provide the leadership and directions of eradication activities." Subsequent appraisals of selected areas in the country which were done annually had also warned Government of "unsatisfactory spraying", "unstable surveillance", "inadequate facilities" and "lack of epidemiological investigation", to cite just a few of the drawbacks mentioned by these teams. In spite of these repeated warnings, there was not enough appreciation either on the part of the State Governments, who were implementing the scheme, or on the part of the Government of India, who acted as the co-ordinating agency, of the need for rectifying the deficiencies in the programme and implementing it in a purposeful manner.

One factor that lent particular urgency to the implementation of the scheme was not adequately appreciated by Government. This was the phenomenon of anopheline resistance to insecticides which became apparent even in the early stages of implementation of the scheme. In 1960, the team of T.C.M. consultants had said that "one of the most compelling arguments for the immediate accomplishment of malaria eradication in India is the evidence that loss of susceptibility to residual insecticides is occurring among various species of malaria-transmitting mosquitoes". They pointed out that though this had occurred "in limited portions of the country", "widespread development of this phenomenon will greatly change and complicate the technique to be employed, with vastly increased cost." In 1962, an

expert committee of W.H.O. drew attention to this problem and observed that in a number of programmes all over the world, this had "impeded the progress of work", and "may result in an increase in the financial burden of the campaign." As would be evident from data given later in this report, subsequent developments in the country have proved these fears to be true.

5 1.25

—Do—

A redeeming feature in the present situation however is that the outbreaks have occurred in the main in seven contiguous States in Central India. Since this is a compact area, the Committee hope that the situation can be tackled by Government, without great difficulty. In any plan of action that Government may draw up for this purpose, the following points should receive adequate emphasis:

- (i) Improvement in the quality of spraying operations and intensification of field supervision on this activity at all levels.
- (ii) Intensification, improved coverage and tighter supervision over surveillance operations in the programme.
- (iii) Parallel and correlated development of rural health services.

6 1.26

—Do—

The Committee further feel that to make the programme effective and ensure its success it is essential to obtain community support for it especially in the rural areas. The civic groups local influential citizens, Block Development Officers should be approached for cooperation and guidance. Their backing will facilitate greater

1

2

3

4

coordination and cooperation in the conduct of the programme and will also act as a check on the proper discharge of duties by the field staff.

7

1-36

Ministry of Health, Family Planning Works, Housing & Urban Development (Department of Health)

In the opinion of the Committee, a definite plan for basic health services is crucial for the successful implementation of the Malaria Eradication Programme. Inadequate appreciation of this point has been responsible for the set-back to the programme in recent years. The Committee note that, as part of the Fourth Plan Scheme, State Governments are proposed to be assisted to set up health centres at a cost of Rs. 44 crores. The Committee hope this plan would be imaginatively planned and executed, so as to provide a "health infrastructure" which would provide the foundation on which the elementary services can be expanded in an orderly manner. The Committee hope that while implementing this scheme the guidelines laid down by the WHO Expert Committee in their Ninth Report would be borne in mind. As pointed out by the Expert Committee, "the Scheme cannot be too elaborate but must be realistic and adapted to the economic possibilities of the country." Special attention should be given "to those functions likely to produce the best possible return in terms of reducing mortality, morbidity and disability", the work being executed on the basis of "a list of priorities and a firm determination to concentrate action on the most important ones."

72

8

1-37

—Do—

Inadequate laboratory facilities in the country have cramped

the provision of diagnostic services to people living in malarious areas. The deficiency in this respect has been repeatedly pointed out by several teams which appraised the working of the Scheme. The Committee note that difficulties are being experienced in getting trained para-medical staff to man these laboratories. The Committee would like to stress the need for a crash programme to recruit the necessary staff and train them adequately.

9

1.38

—Do—

One point that should receive particular attention is the need to get blood smears examined in the laboratories very quickly. The data given earlier in this report would show that a large backlog of unexamined slides accumulated in the laboratories between 1961 and 1963. Rapid and correct examination of blood smears is of great importance both for purposes of treatment and epidemiological investigation. The Committee hope that a strict watch would be kept on the laboratories in this regard, as otherwise, the investment of funds in this service will be rendered purposeless.

73

10

1.39

—Do—

The Expert Committee of the WHO have pointed out that slide examination as a diagnostic technique suffers from certain inherent limitations which may render it "insufficiently sensitive" in certain situations. They have therefore suggested that "practical serological methods" for case detection "should be given the fullest encouragement." This is a matter which calls for research support and the Committee would like Government to initiate studies in this regard with the support of the WHO, so that reliable diagnostic methods are ultimately employed in the laboratories.

1

2

3

4

11

1.40

Ministry of Health Family
Planning, Works, Housing
and Urban Development
(Department of Health)

One other point that has come to the notice of the Committee from the information furnished to them deserves mention. Nearly three-fourths (3,924 Nos.) of the total stock of microscopes with the laboratories (4,259 Nos.) have been giving "poor performance" due to oil immersion lenses getting "hazy", a situation which even repairs have not been able to improve. All these microscopes have been obtained from a particular firm overseas, with whom arrangements for their repairs were discussed by Government in July, 1968. The Committee would like to be informed whether these microscopes have been repaired and been giving satisfactory performance. The Committee note that there is a programme for the procurement of 1,271 microscopes representing the requirements over the next four years ending 1972-73. The Committee hope that careful selection of instruments will be made in future keeping in view the past experience. It would appear to be better to go in for microscopes which give trouble-free and uninterrupted service.

74

12

1.49

—Do—

The Committee note that one of the factors that retarded spraying operations under the National Malaria Eradication Programme was the belated supply of insecticides. The representatives of Government attributed this belated supply to the "late arrival of imports" and "difficulties in finalising deals with foreign firms" and pleaded that advance orders could not be placed due to "difficulties ... about budget allocation and getting clearance from Finance to place orders in advance." The Committee observe that advance in-

13

1-50

—Do—

dents are now being placed for insecticides required for the programme.

The data furnished to the Committee show that every year since 1964-65 it took anything from 7 months to 2 years for supplies of insecticides to materialise, after proposals for their purchase were mooted. It is a matter of regret that it took Government such a long time to become alive to this situation and start the procedure of placing advance orders. The Committee hope that adequate care would be taken to ensure that "administrative bottlenecks" do not interfere with the timely supply of insecticides to the operational areas. As pointed out by the WHO Expert Committee whenever a country decides to undertake malaria eradication, funds should be "budgeted for the whole programme, available at the planned date and be managed with necessary flexibility." The Committee would also like it to be considered whether buffer stocks of insecticides would help to ease any difficulty caused by unexpected delays in transit or supplies.

14

1-51

—Do—

The information furnished by Government to the Committee shows that the country has, between 1964-65 and 1968-69, spent Rs. 1,067 lakhs on imports of insecticides and anti-malarial drugs. The projected requirements of insecticides over the five years ending 1972-73 is 58,524 tons, out of which only 85,464 tons, i.e., less than half is expected to be indigenously available. Similarly, against the requirements of 720 million tablets of chloroquine/amodiaquine over the next five years indigenous procurement on present indications would be possible only to the extent of 50 million tablets a year.

there being no indigenous production to meet the estimated demand of 70 million tablets of primaquine. This situation underlines the urgent need for Ministry of Health, in consultation with Directorate-General of Technical Development, to explore the scope for increasing/establishing indigenous production of insecticides and anti-malarial drugs. The Committee would like a plan of action to be drawn up for this purpose immediately.

15 1-52

Ministry of Health, Family Planning, Works, Housing and Urban Development (Department of Health)

While drawing up a plan of action for expanding indigenous production of insecticides and drugs, the Committee would like Government to bear in mind two important considerations. The first arises out of the health hazard posed by use of DDT which has led to its being banned in some countries of the World. The Committee would like Government to initiate immediately detailed studies in this regard. These studies should include the use of DDT for malaria eradication as well as a pesticide in agricultural operations. The second consideration has a bearing on reports of resistance of malaria parasites to drugs like chloroquine, primaquine and amminoquinoliness which are being used in the country at present and are largely imported. The WHO Expert Committee have suggested that more data should be collected in this regard in different parts of the World through field tests. The Committee would like the Ministry of Health to draw up in collaboration with CSIR a programme to collect baseline data in the field about the presence of drug resistance and its

distribution. The programme should also seek to secure an empirical screening of existing chemical compounds and thorough study of relevant physiological and biochemical phenomena to evolve new drugs, if possible, which would be effective against resistant strains.

16

1.57

—Do—

Earlier in this report, the Committee have drawn attention to the problem of resistance on the part of Malaria-transmitting Mosquitoes to insecticides and to the disturbing implications of this phenomenon for the future of the programme, both in terms of cost and speed of implementation. The Committee would like Government not to lose further time and to establish, through thorough entomological investigations, the causes of persisting transmission in areas where insecticide resistance has developed. In particular, the investigations should seek to ascertain whether persisting transmission is in any way due to what the W.H.O. Expert Committee have characterised as the "presence of unsuspected vector species, not effectively controlled by insecticides." A plan of action for controlling and interrupting transmission in those areas should also be drawn up, having regard to suggestions made by WHO Expert Committee from time to time, due consideration being given to the following measures, subject to operational conditions:

- (i) Supplementing insecticidal attack by larvicidal operations.
- (ii) Mass drug administration.

17

1.58

—Do—

It appears to the Committee that till a solution can be found to this problem a concerted campaign against the aquatic stages of the mosquito i.e. larval and pupa stages will have to be intensified.

1	2	3	4
18	1.59	Ministry of Health, Family Planning, Works, Housing and Urban Development (Department of Health)	It will also be necessary for Government to undertake entomological investigations to determine how best the breeding of malarial mosquitoes could be checked so that their multiplication is effectively arrested.
19	1.66	—D—	The National Malaria Eradication Programme employs a substantial complement of staff. The total expenditure on this account, including contingent expenditure, amounted to Rs. 95.37 crores during the period 1958-59 to 1967-68. The Committee would like Government to examine whether, consistent with the need to secure effective implementation of the scheme, there is scope for economy. A works or norms study could be conducted for this purpose.
20	1.67	—D—	From the information furnished by Government, the Committee gather the impression that the present surveillance machinery for detection of malaria cases is "very expensive". The Committee would like Government seriously to undertake research studies to simplify methods of detection and bring down the cost in this regard.
21	1.68	—D—	One of the personnel problems that Government are faced with is the "low morale" which would appear to have seriously interfered with the successful implementation of the programme. The representatives of Government also pointed out that there had been

instances of "the programme...not being executed" by the staff or "fictitious entries" regarding spraying in certain areas resulting in "complete failure of the programme in respect of certain matters." The Committee would like the Government of India in consultation with the States to draw up a plan for stringent action to deal with cases of dereliction or delinquency. For this purpose a systematic record of such occurrences may prove useful and have a salutary effect on the workers. At the same time, the Committee would like Government to appreciate that lack of assured career prospects could greatly dampen morale and lead to neglect and inefficiency. As pointed out by the W.H.O. Expert Committee, a number of programmes "have suffered from an excessive turnover resulting from unsatisfactory conditions of service and lack of interest." The Committee would like Government to consider how best the scope for absorption of temporary or seasonal staff could be maximised through training programme calculated to equip them for diverse work in the general health services. The aim should be to assure each employee a reasonable service prospect unless found guilty of incompetence, neglect, dis-honesty or other justifiable cause for dismissal.

79

The work of the spraying staff employed in the Scheme involves health hazards arising out of exposure to insecticides. The Committee would like Government to take adequate steps to protect the staff against such hazards. Their area of work should also be mapped out in such a way as to avoid undue burden or inconvenience.

1	2	3	4
23	1-74	Ministry of Health, Family Planning, Works, Housing and Urban Development (Department of Health)	<p>In their 42nd Report (Third Lok Sabha) as well as their 71st Report (Fourth Lok Sabha), the Committee have drawn attention to the unsatisfactory position regarding deployment of vehicles placed at the disposal of the States for the implementation of the National Malaria Eradication Programme. The Committee had been drawn attention to the fact that nearly 50 per cent of the existing fleet of 2,653 vehicles was off the road. Basically the very poor quality of maintenance of the vehicle fleet has strained their efficiency and life and interfered with their optimum utilisation. The Committee note that pursuant to their suggestions in their earlier Reports, a committee has been set up to examine how many vehicles out of the existing fleet could be rendered road-worthy. The Committee hope that this examination would be speedily completed and that, before any proposal for augmentation of the fleet is approved, the scope for pressing into service the maximum number of vehicles out of the existing fleet would be carefully examined, taking into account the economics of their repairs.</p>
24	1-75	—Do—	<p>From the information furnished to the Committee, it is observed that there is a plan for purchase of 1,987 vehicles for the period ending 1971-72. The Committee have, in their 97th Report (Fourth Lok Sabha) report, pointed out the desirability of phasing the programme of purchase of vehicles as and when they became road unworthy instead of deferring it over years. The Committee would also like Government to scrutinise this requirement very critically and</p>

1	2	3	4
			ensure that only the minimum number of vehicles required by operational areas are purchased, purchases for co-ordinating and headquarters organisations being avoided as far as possible.
25	1 82	Ministry of Health, Family Planning, Works, Housing and Urban Development (Deptt. of Health)	The Committee would like constant vigil to be maintained in border areas for controlling malaria. The good offices of the WHO should be availed of in deciding the phasing of the programme in these areas.
26	1.83	—Do—	The Committee are concerned to observe that there are about 40 problem areas in the country where transmission of malaria persists. The Expert Committee of WHO have laid down guidelines for implementation of the scheme in such areas, which Government will no doubt duly take note of. In particular, attention should be directed to "effective attack measures and thorough case investigation" so that persistence of transmission could be eliminated.
27	1.84	—Do—	The Committee note that an overpayment of a sum of Rs. 6.32 lakhs to surveillance workers by way of allowances, occurred in the State of Orissa between 1962-63 and 1966-67. Government have stated that the matter is under investigation in consultation with the State Government. The Committee would like to be apprised of the findings. In case an overpayment is established, appropriate steps for recovery should be speedily taken.

28 1 85 —Do—

The Committee observe that claims for transit losses amounting to Rs. 1.11 lakhs in respect of DDT and anti-malarial drugs sent by rail have still to be realised. The Committee would like the matter to be pursued further and recoveries effected.

29 1 86 —Do—

Malaria is one of the most widespread diseases. Its existence depends on two factors, the mosquito capable of transmitting the parasite and the humans harbouring the parasite in the blood. It can be controlled effectively only when measures are simultaneously applied against the mosquito and the infection present in a human being.

30 1 87 —Do—

Over the years, Government have made a substantial investment in the National Malaria Eradication Programme. The data given earlier in this report would show that between 1958-59 and 1967-68, the investment amounted to Rs. 154.64 crores, a little over one-fifth of this investment involving expenditure in foreign exchange. The investment in the scheme amounts to 12.72 per cent of the total Central and State health budget. Government have, therefore, a vital stake in the scheme and its successful implementation is of paramount importance.

31 1 88 —Do—

The findings in this report will show that, while the scheme progressed satisfactorily till 1963-64, set-backs have occurred since then with focal outbreaks of malaria in a number of States. In the result the completion of the programme has been delayed by over six

years. The outlay for completion of the scheme has in consequence undergone an enhancement from Rs. 19.21 crores to Rs. 91.74 crores.

32 1.8) Ministry of Health, Family Planning, Works, Housing and Urban Development (Deptt. of Health)

Though this situation has been brought about by a variety of reasons, the principal contributory factors that affected the progress of the operations were these:

- (i) Failure to ensure that spraying coverage was total, complete, sufficient and regular.
- (ii) Absence of timely provision of staff at certain levels, particularly at diagnostic centres and of insecticides and anti-malarial drugs.
- (iii) Inadequate emphasis on surveillance techniques.
- (iv) Failure to develop a sound health infrastructure in the field to take over the scheme at the consolidation stage.

33 1.90 —Do—

The Committee have made suggestion earlier in this report to overcome these deficiencies. They trust that Government would take speedy implemental action thereon. As early as 1960 the TCM Malaria consultants summed up the essence of the strategy for the successful implementation of the programme in the country in the following words:

63

