

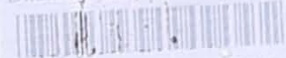
MALARIA CONTROL

in

BOMBAY STATE



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MALARIA CONTROL
IN
BOMBAY STATE

Price: One Anna

ISSUED BY
THE DIRECTORATE OF PUBLICITY, GOVERNMENT OF BOMBAY, BOMBAY

First Published: September 1953

PART I

MALARIA PROBLEM IN BOMBAY STATE

Malaria is Public Enemy Number 1, as much because of its profound effects on the economics of a country, more especially in relation to food cultivation, as the vastness of the areas in which it is prevalent. The first chart in this Part presents some of the salient economical considerations on account of the prevalence of malaria in the State. The second chart shows the widespread distribution of malaria in the State. Children bear the brunt of this disease which is manifested through enlargement of their spleen. Hence, in all malarial surveys children between two and ten years are examined for enlarged spleen, and the percentage of such children showing enlargement is taken as an evidence of the degree of malarial prevalence. The second chart shows the degree of malarial prevalence in each district thus estimated.

MALARIA IN BOMBAY STATE

ECONOMICS

POPULATION OF STATE	35,900,000	APPROX.
POPULATION LIVING IN MALARIOUS SECTIONS ..	20,000,000	"
NUMBER OF MALARIA CASES PER YEAR	5,000,000	"
NUMBER OF DEATHS DIRECTLY DUE TO MALARIA PER YEAR	50,000	"

LABOUR DAYS LOST PER YEAR	15,000,000	"
APPROXIMATE WAGES LOST	RS. 30 MILLIONS	

ALSO:—

LOSS OF 25% EFFICIENCY FOR REST OF THE YEAR EQUALLING Rs. 450 MILLIONS.

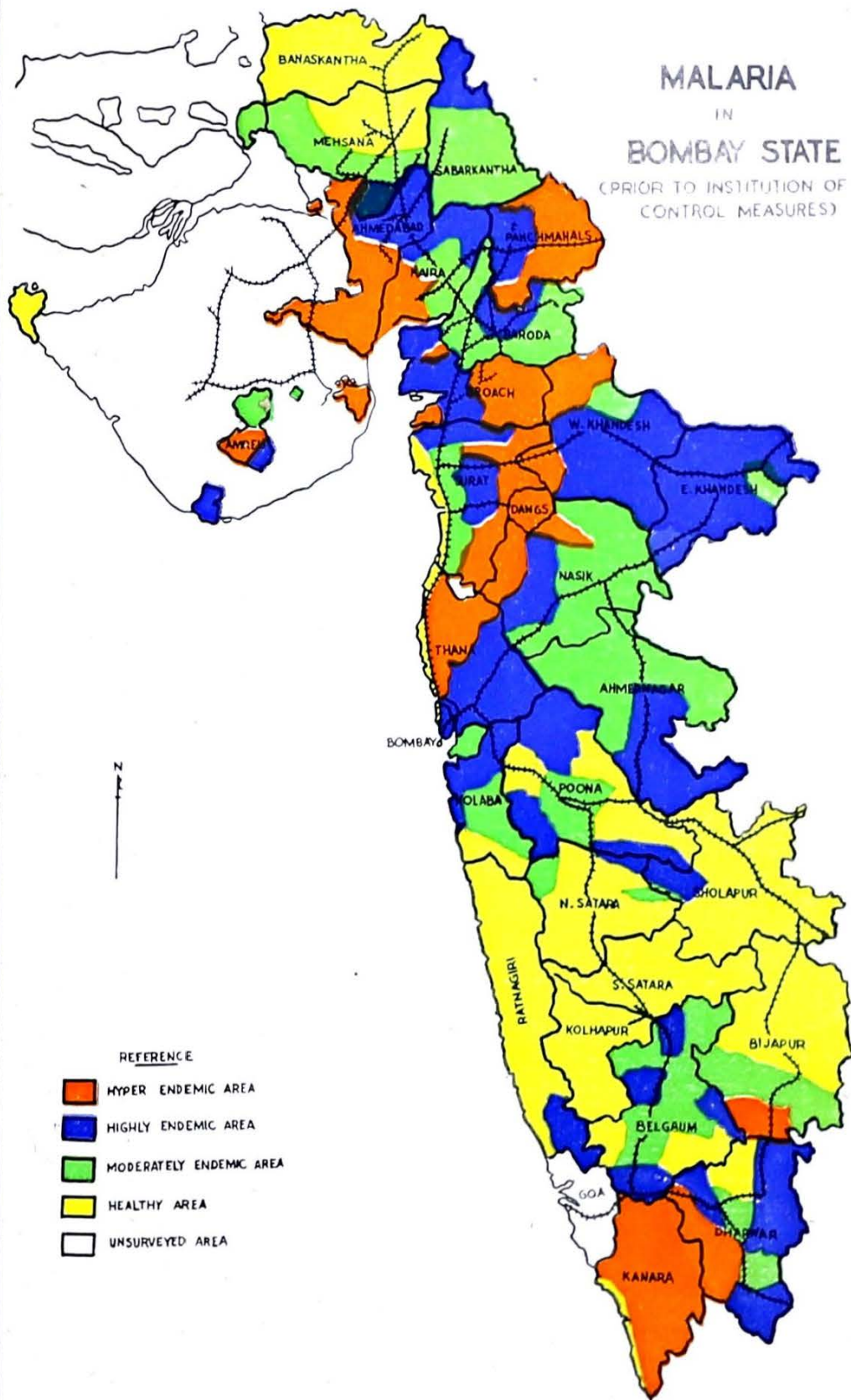
RICH LANDS REMAIN UNEXPLOITED : CHILDREN—MAIN VICTIMS.

CAUSES STILL BIRTHS, MISCARRIAGES AND ABORTIONS.

APPROXIMATE LOSS DUE TO DEATHS, ETC. Rs. 500,000,000

MALARIA IN BOMBAY STATE

(PRIOR TO INSTITUTION OF
CONTROL MEASURES)

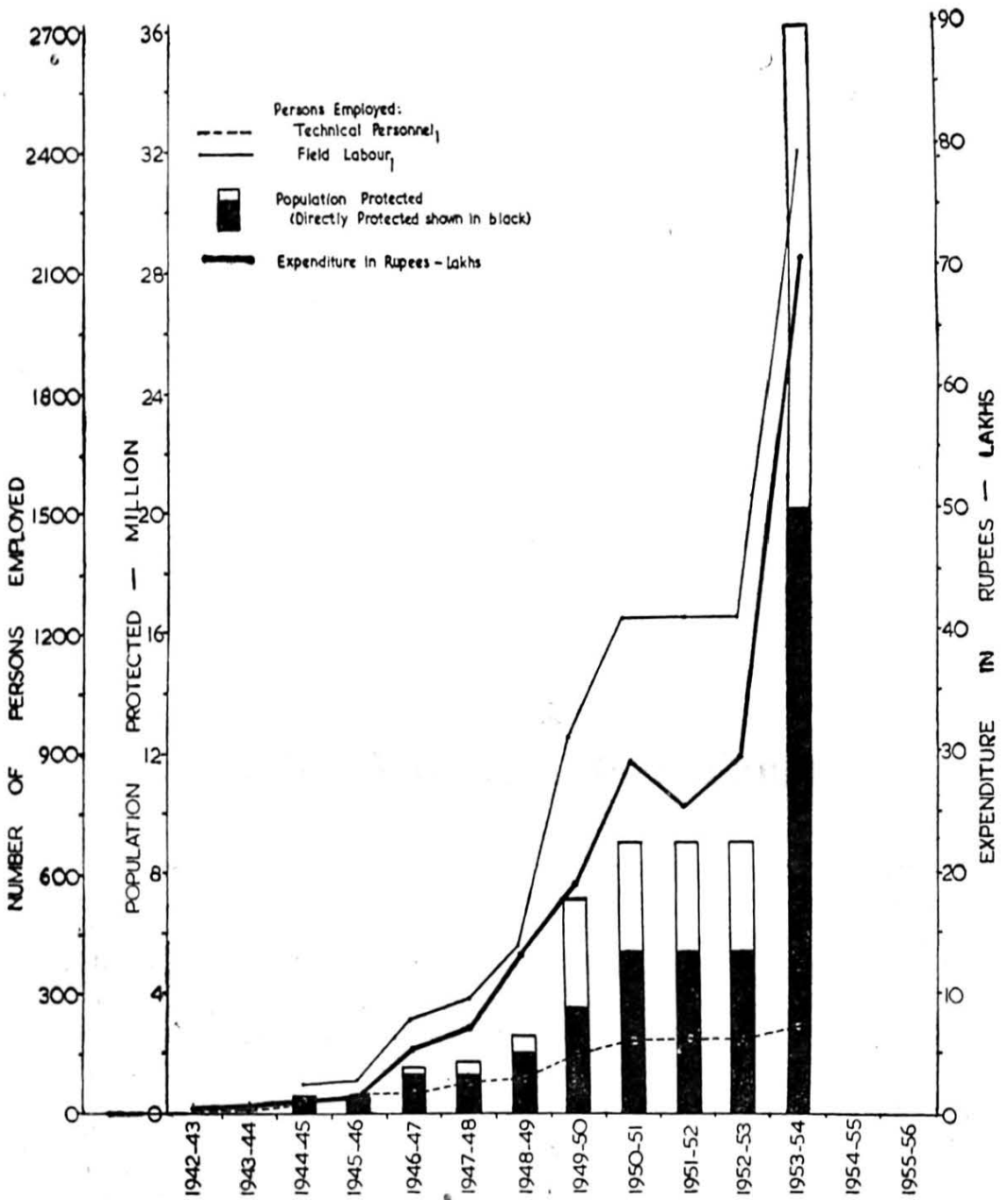


PART II

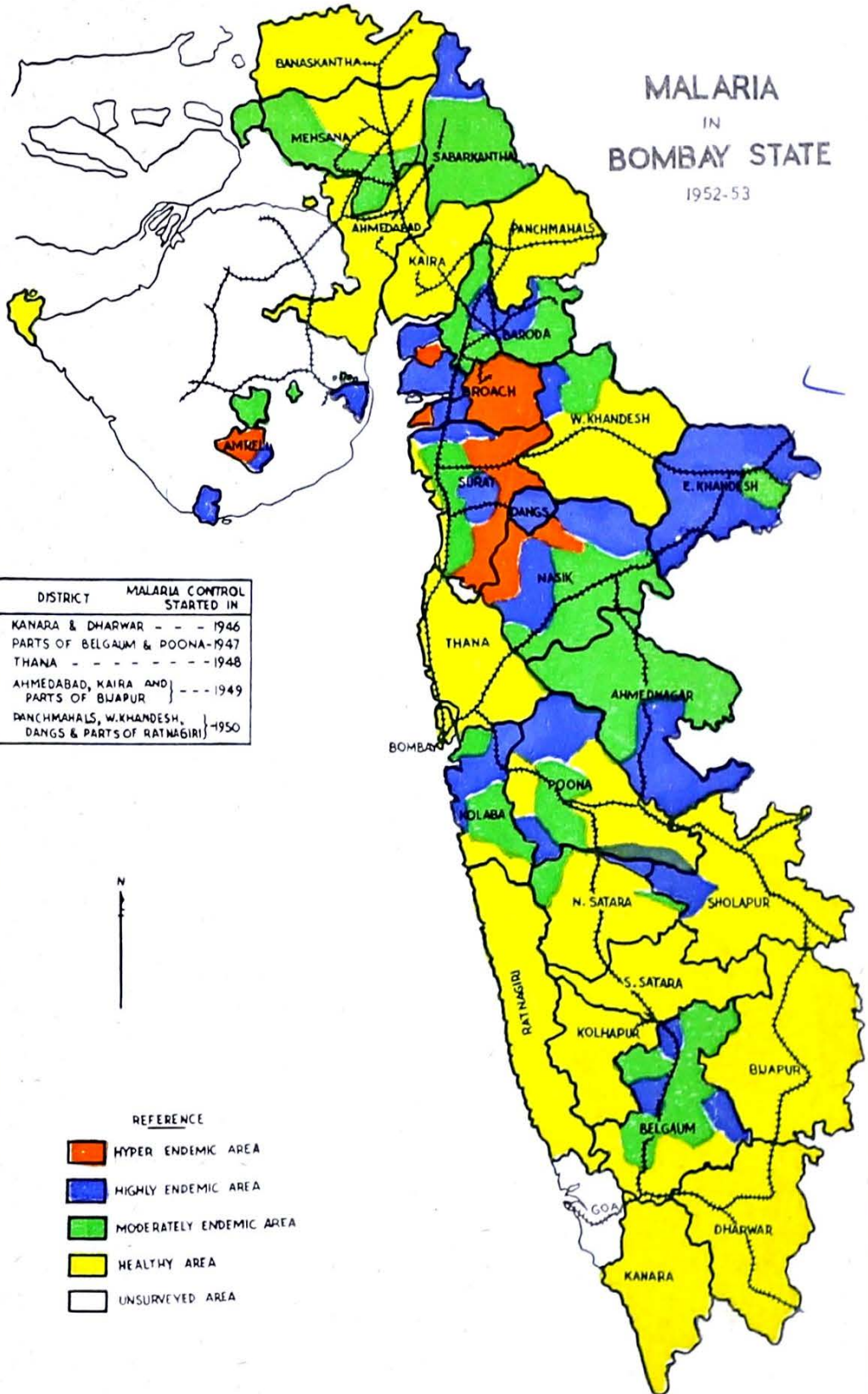
PROGRESS OF MALARIA CONTROL

The Malaria Organization in Bombay State was constituted first in 1942 with an annual budget of Rs. 50,000. It has steadily progressed from that year to 1953 in its activities in the shape of malaria control. During the year 1952-53, the annual budget was about 30 lakhs of rupees. The first and second charts show this steady expansion in the programme of the Malaria Organization. Subsequent charts in this Part represent the distribution of malaria in 1952-53, after ten years of work, the progressive diminution in spleen rates in children in the districts taken up for control and the steady reduction in the number of cases treated for malaria in these districts. The last chart in this Part shows the great reduction in death rates due to malaria in Kanara district which, prior to the institution of malaria control in 1946, was one of the most heavily affected districts in the State.

PROGRESS IN MALARIA CONTROL BOMBAY STATE



MALARIA IN BOMBAY STATE 1952-53



MALARIA IN BOMBAY STATE

WHAT BOMBAY GOVT. HAS DONE TILL THE END OF 1952-53

PERMANENT MALARIA ORGANIZATION ESTABLISHED IN 1942

MALARIA SURVEY OF ENTIRE STATE COMPLETED IN 1952

MALARIA CONTROL SCHEMES BY USE OF DDT STARTED IN:—

KANARA DISTRICT	}	1946
DHARWAR "		
PART OF BELGAUM & POONA DISTRICTS	}	1947
THANA DISTRICT		1948
AHMEDABAD DISTRICT	}	1949
KAIRA "		
BIJAPUR "		
PANCHMAHALS	}	1950
W. KHANDESH "		
DANGS "		
RATNAGIRI "		

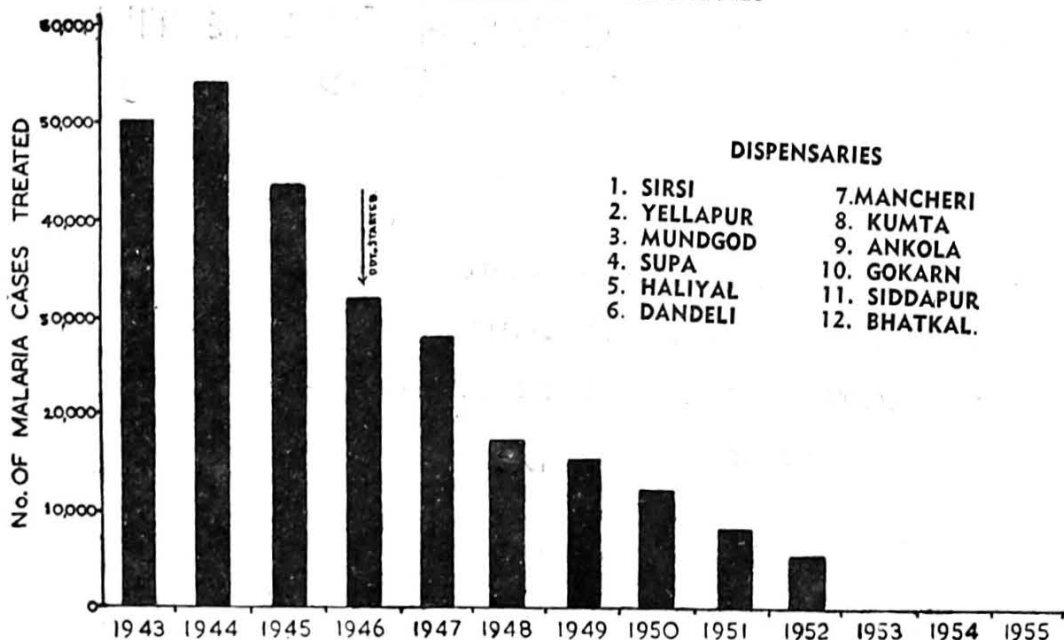
POPULATION:

LIVING IN MALARIOUS SECTIONS	20,000,000
DIRECTLY PROTECTED	6,800,000
INDIRECTLY PROTECTED	11,500,000
NUMBER OF MALARIA CASES PREVENTED IN 1952	OVER 1,000,000
ANNUAL BUDGET FOR 1952-53	RS. 2,800,000
PER CAPITA COST PER ANNUM		
DIRECTLY PROTECTED	6.6 ANNAS
INDIRECTLY PROTECTED	3.9 "

REDUCTION IN MALARIA CASES

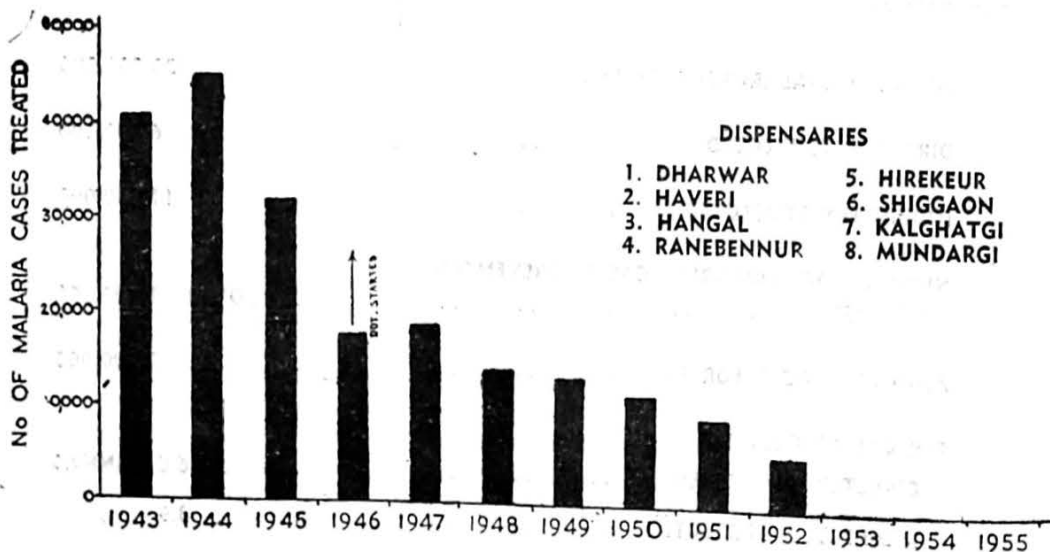
KANARA DISTRICT

MALARIA CASES TREATED IN 12 DISPENSARIES



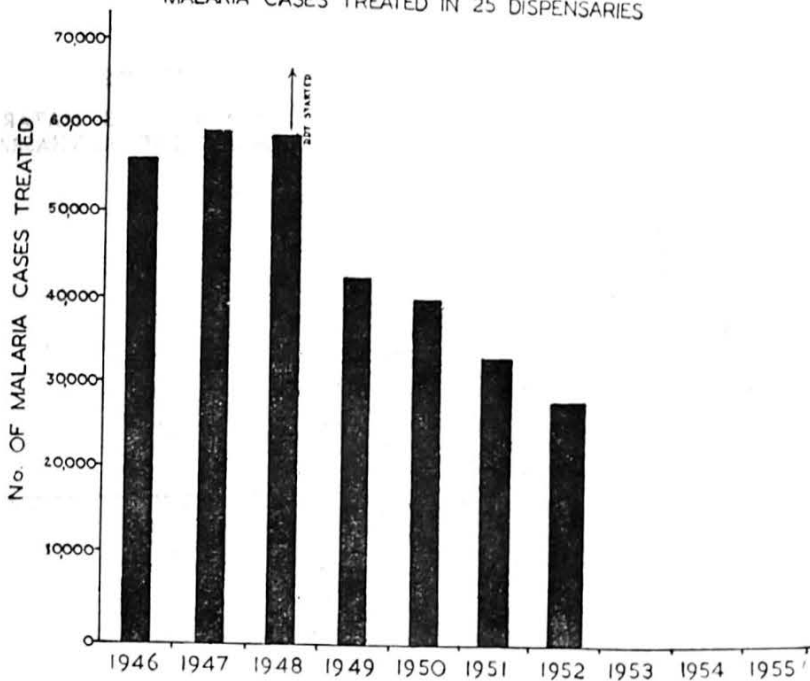
DHARWAR DISTRICT

MALARIA CASES TREATED IN 8 DISPENSARIES



THANA DISTRICT

MALARIA CASES TREATED IN 25 DISPENSARIES

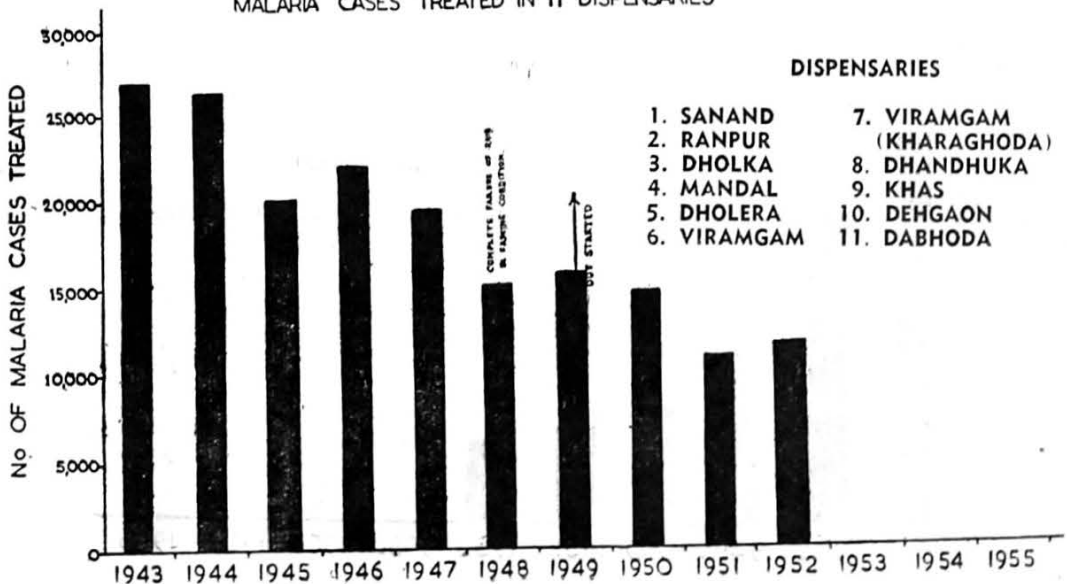


DISPENSARIES

1. THANA CIVIL HOSPITAL
2. THANA—C. R. WADIA
3. BHIWANDI
4. PADGHA
5. ANJUR
6. BASSEIN
7. SHIRGAD
8. BHAIN DAR
9. JAWHAR
10. VIKRAMGAD
11. ASHAGAD
12. DAHANU
13. UMBERGAON
14. MAHIM
15. MANOR
16. BOISAR
17. EDVAN
18. VADA
19. MOKHADA
20. KHODALA
21. SHAHPUR
22. KALYAN
23. BADLAPUR
24. KINAVLI
25. MURBAD

AHMEDABAD DISTRICT

MALARIA CASES TREATED IN 11 DISPENSARIES

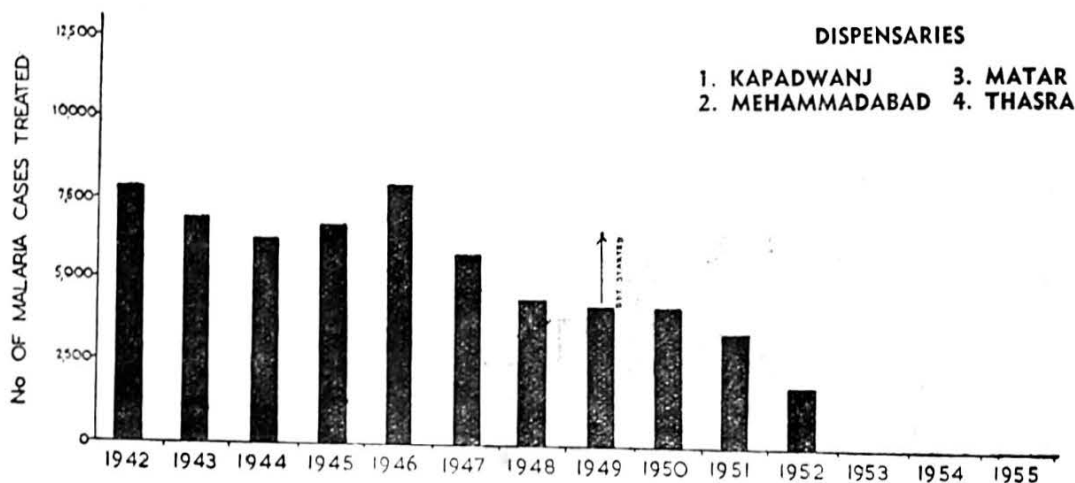


DISPENSARIES

- | | |
|-------------|-----------------|
| 1. SANAND | 7. VIRAMGAM |
| 2. RANPUR | 8. (KHARAGHODA) |
| 3. DHOLKA | 9. DHANDHUKA |
| 4. MANDAL | 10. KHAS |
| 5. DHOLERA | 11. DEHGAON |
| 6. VIRAMGAM | 11. DABHODA |

KAIRA DISTRICT

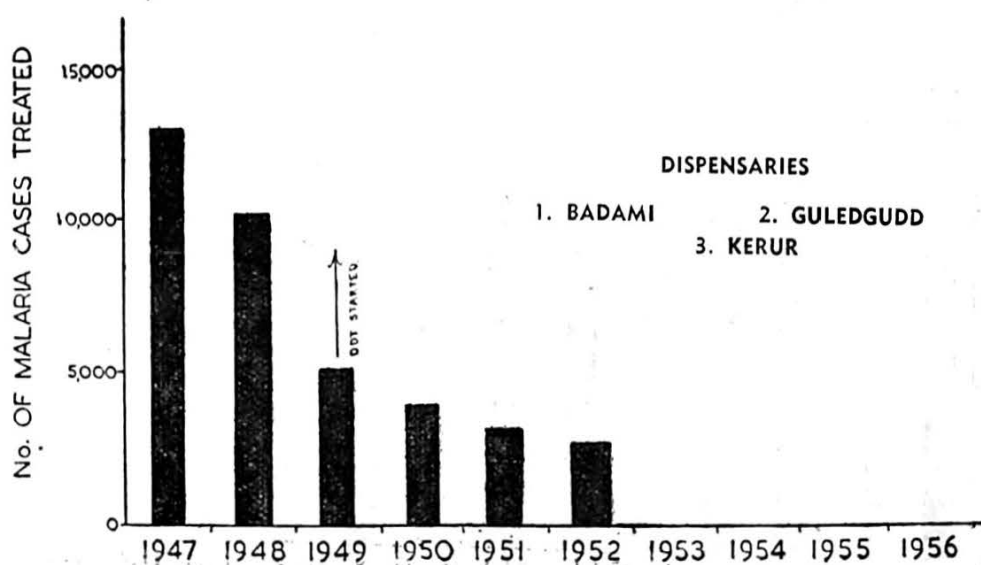
MALARIA CASES TREATED IN 4 DISPENSARIES



BIJAPUR DISTRICT

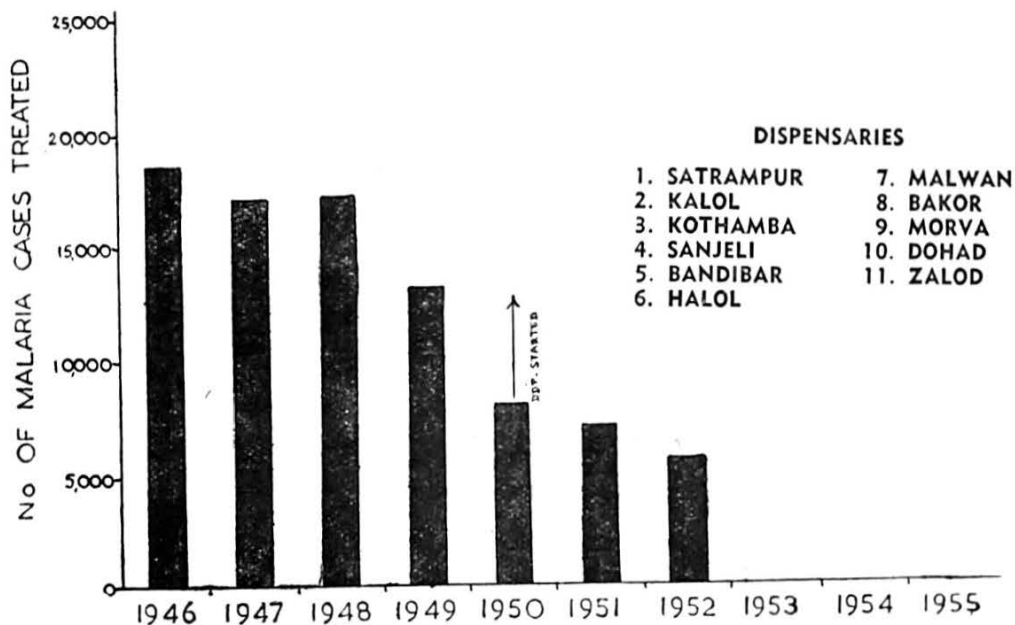
(BADAMI TALUKA)

MALARIA CASES TREATED IN 3 DISPENSARIES



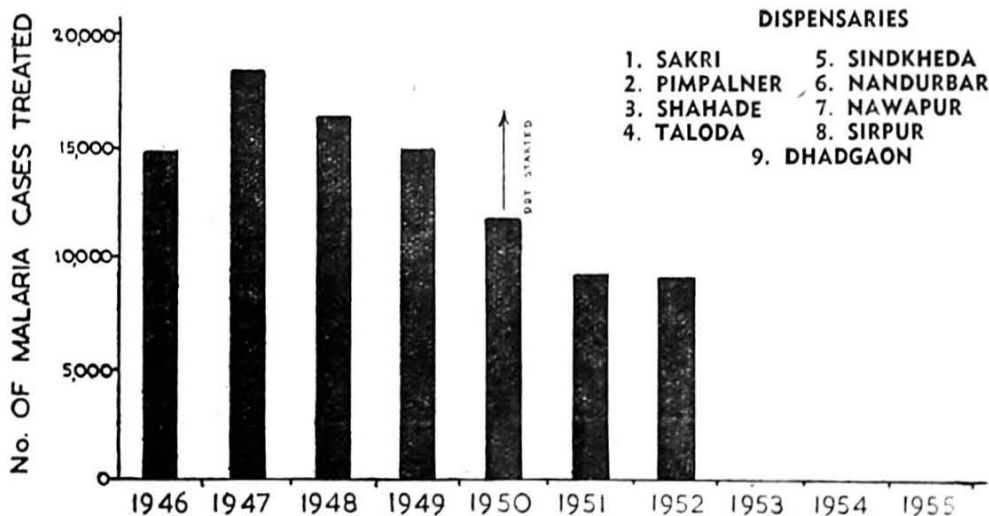
PANCHMAHALS DISTRICT

MALARIA CASES TREATED IN 11 DISPENSARIES

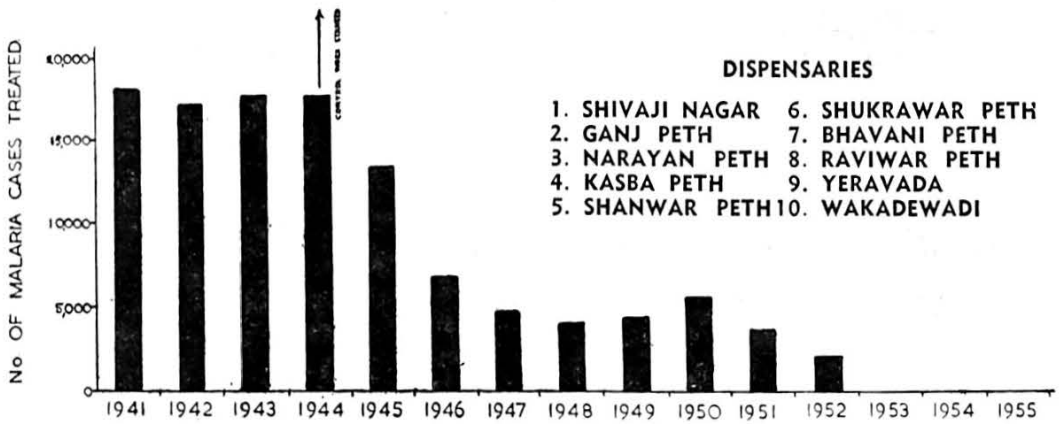


WEST KHANDESH DISTRICT

MALARIA CASES TREATED IN 9 DISPENSARIES

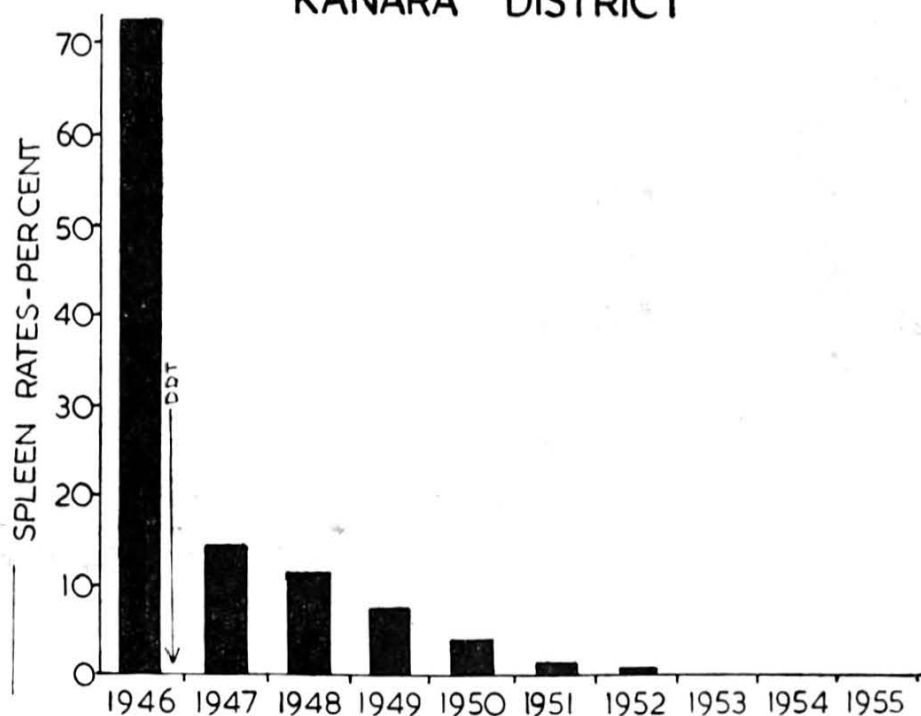


POONA CORPORATION AREA
MALARIA CASES TREATED IN 10 DISPENSARIES

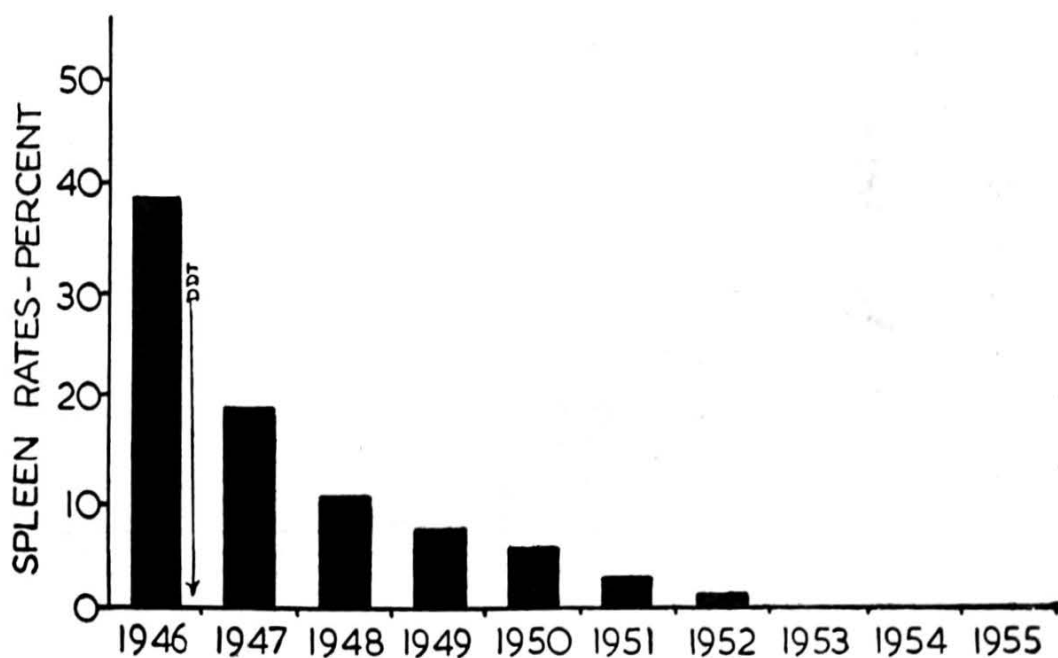


REDUCTION IN PERCENTAGE OF SPLEEN RATES

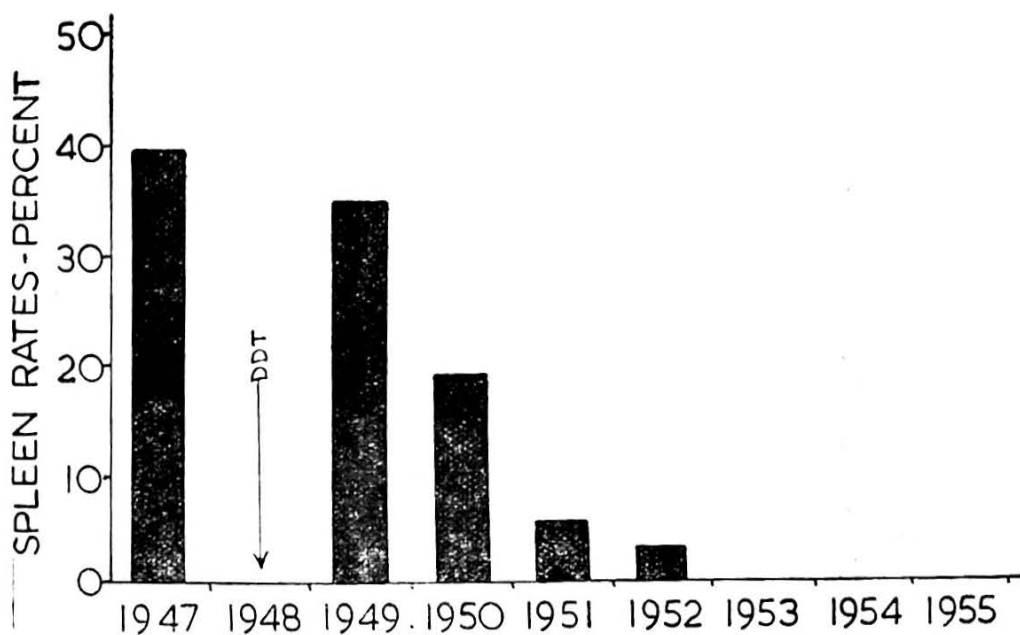
KANARA DISTRICT



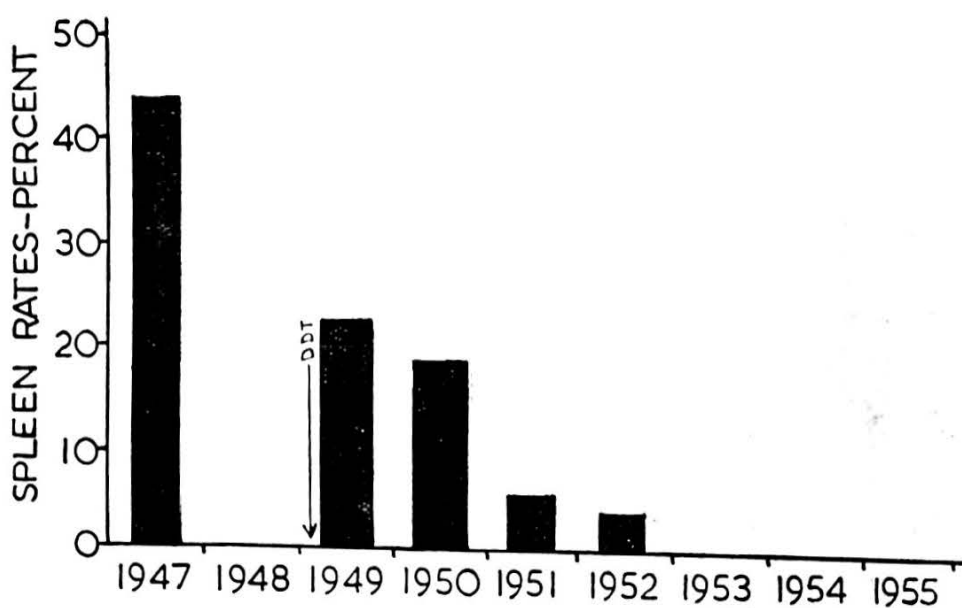
DHARWAR DISTRICT



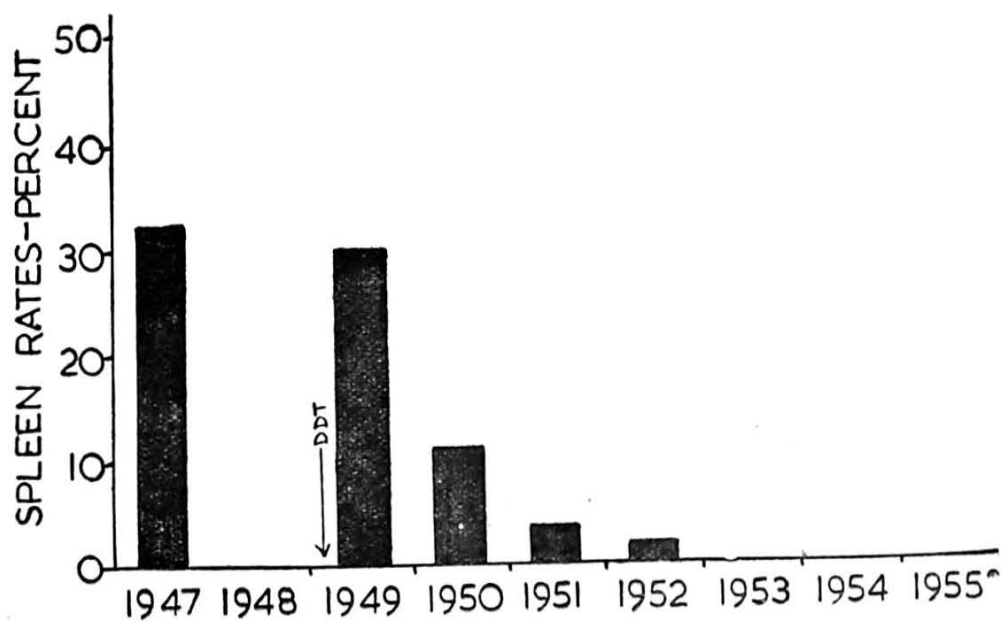
THANA DISTRICT



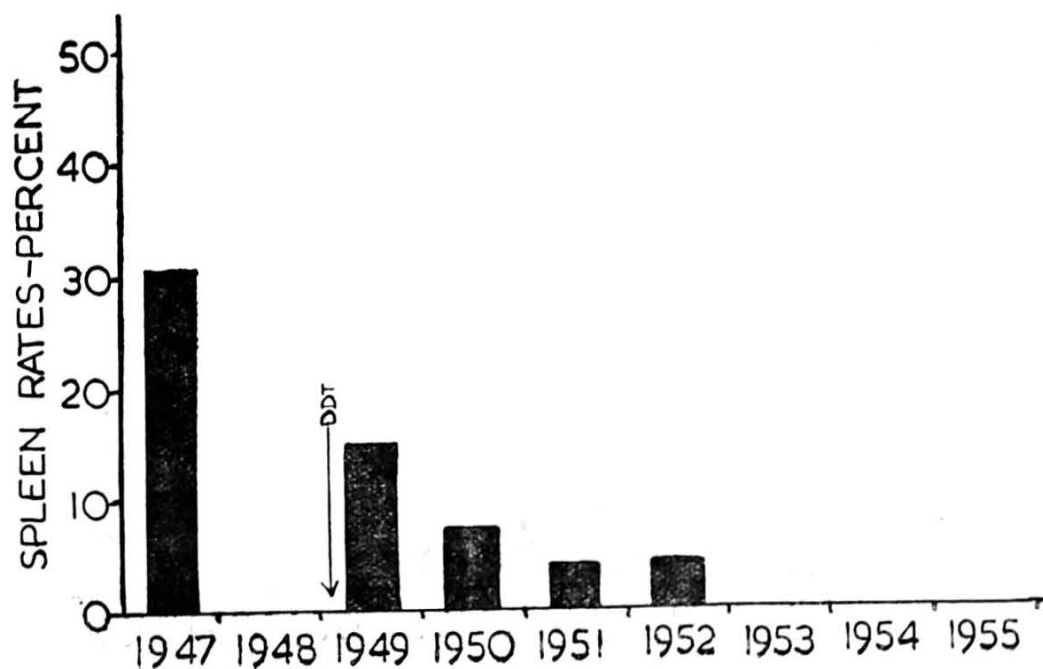
AHMEDABAD DISTRICT



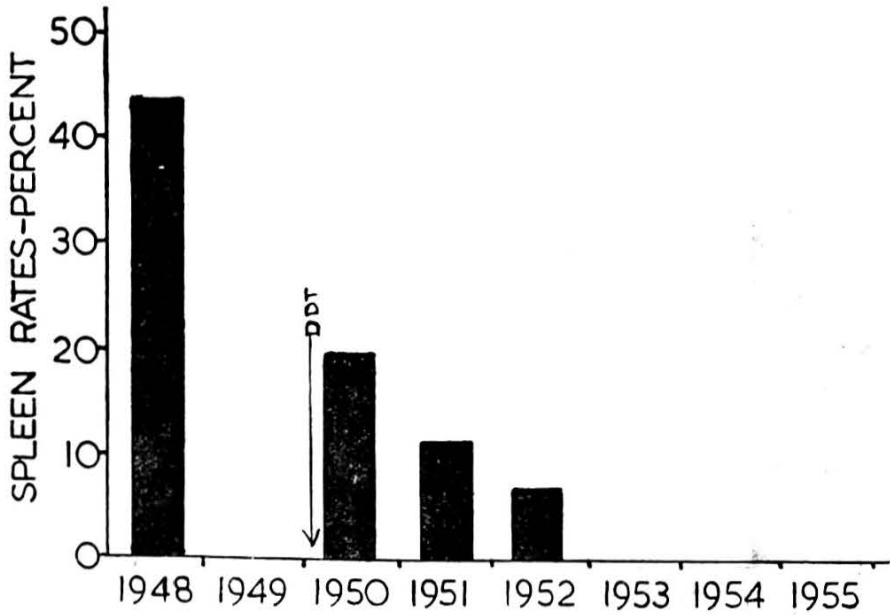
KAIRA DISTRICT



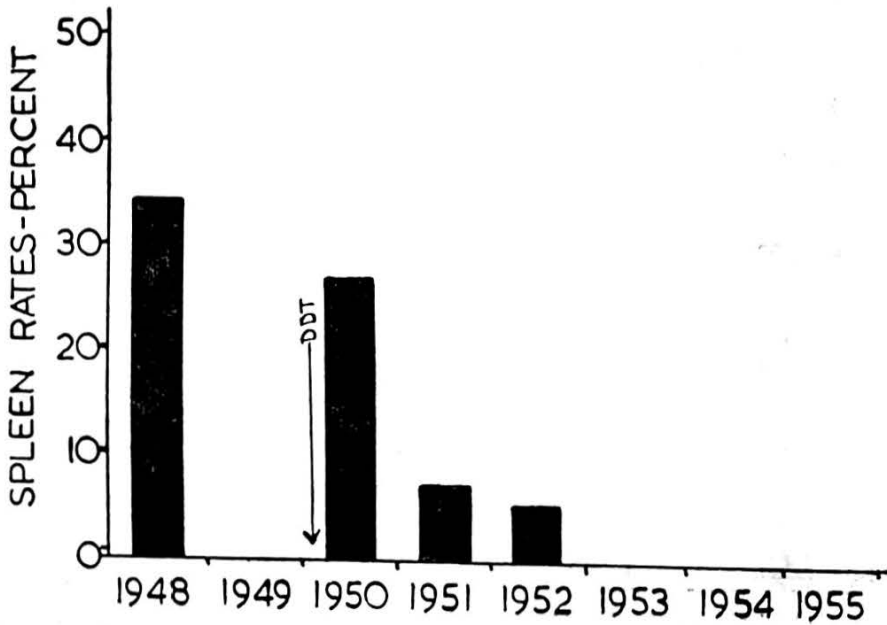
BIJAPUR DISTRICT



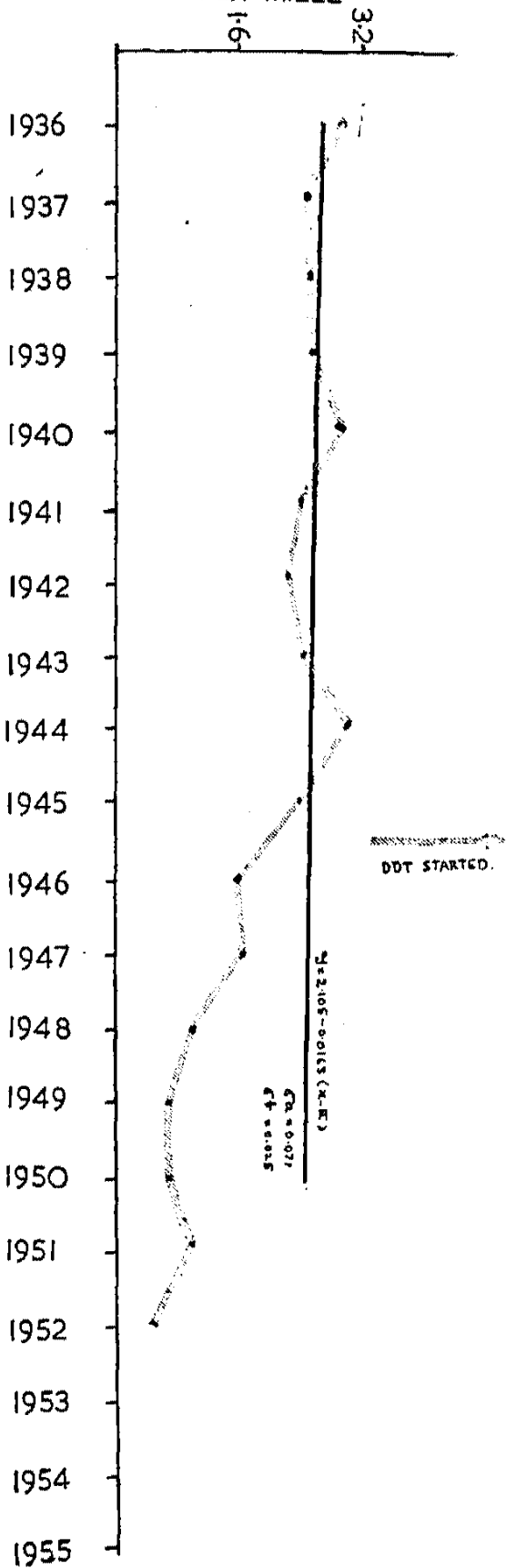
PANCHMAHALS DISTRICT



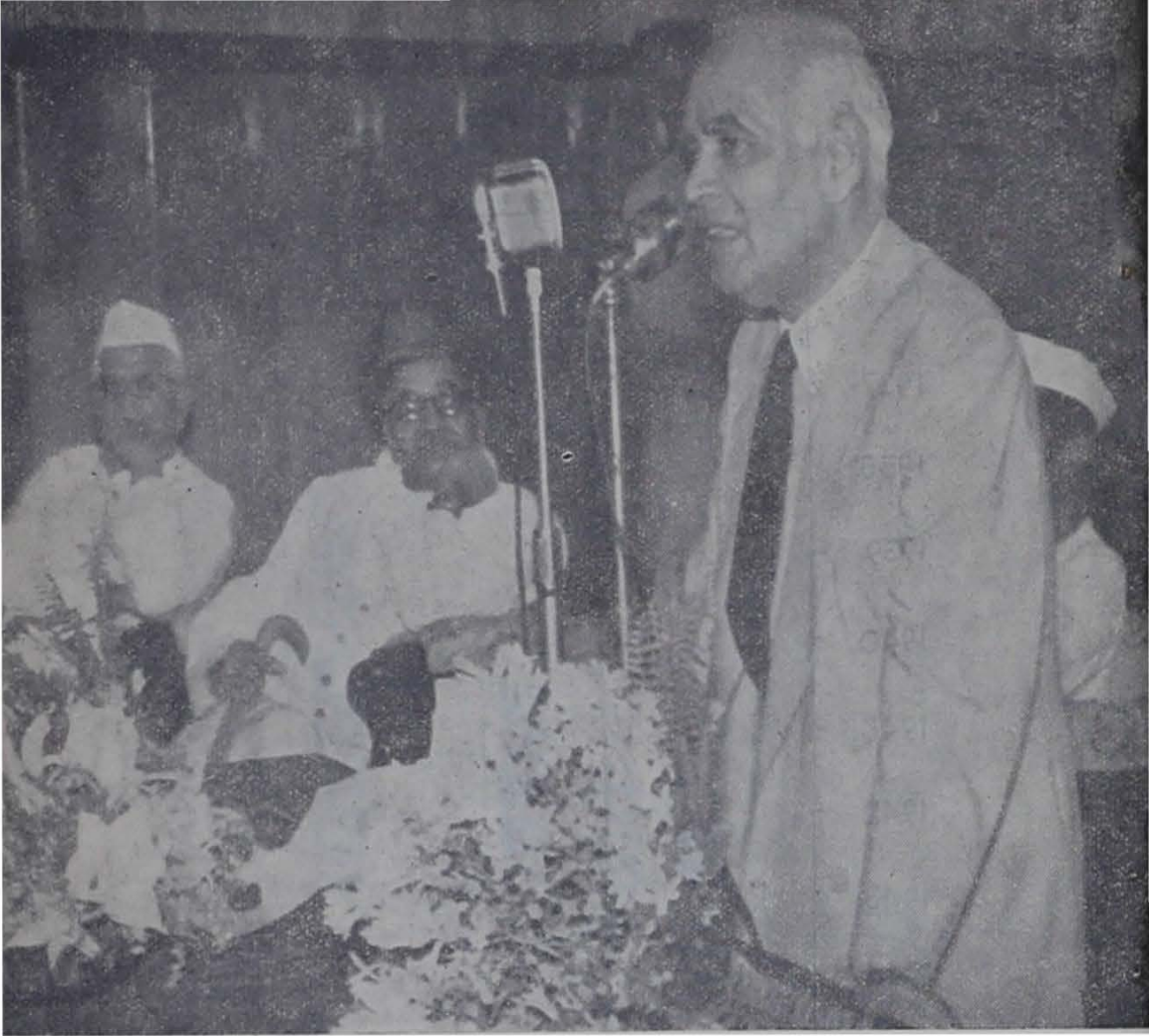
W. KHANDESH DISTRICT



MALARIA DEATH RATES
PER MILLE



KANARA DISTRICT
MALARIA DEATH RATES



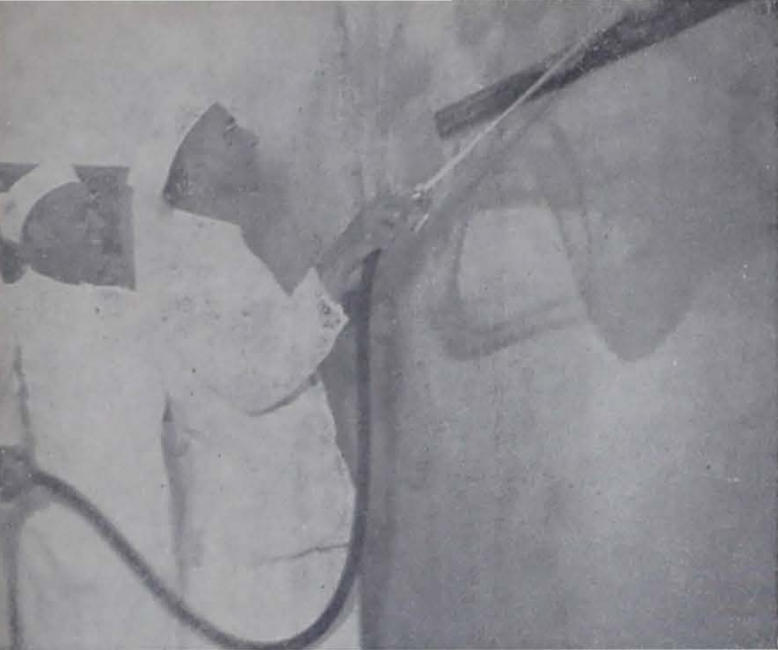
Shri G. S. Bajpai, Governor of Bombay, is seen inaugurating the State-wide Malaria Control Programme for Bombay State.

PART III

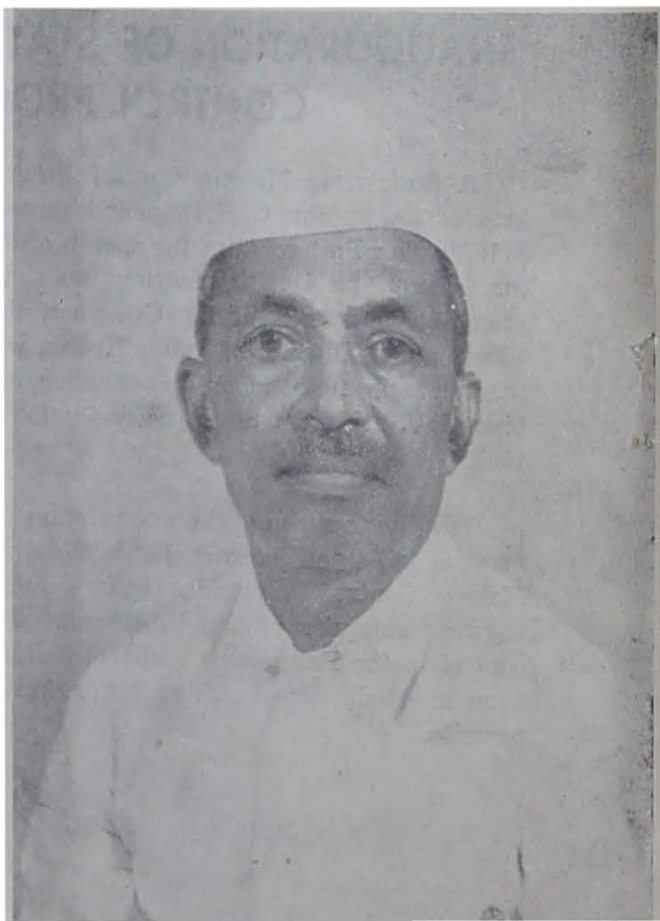
INAUGURATION OF STATE-WIDE MALARIA CONTROL PROGRAMME

A State-wide Malaria Control Programme for Bombay State was inaugurated by Shri G. S. Bajpai, Governor of Bombay, in Poona on June 3, 1953. This Part contains the speech of Shri Shantilal H. Shah, Minister for Labour and Health, inviting the Governor to inaugurate the Programme, the speech of the Governor, the speech made by Dr. D. K. Viswanathan, Director of Public Health, while proposing a vote of thanks, the messages received on the occasion and the talk broadcast by Shri Shantilal Shah from the Bombay Station of All India Radio on June 9, 1953.

The charts showing the organization (collaboration with the Government of India and international bodies), the budget in terms of National Malaria Control Programme and researches carried out and the maps showing mosquito vectors in different districts and the districts under control in the Programme and those which are not malarious have also been inserted. The last illustration indicates the life cycle of malaria parasite.



The Chief Minister, Shri Morarji Desai, launching the DDT campaign of the Ahmedabad Municipal Corporation at Ahmedabad recently.



Shri Shantilal H. Shah, Minister for Labour and Health, under whose guidance the Malaria Control Programme is being worked in the State.

MALARIA CONTROL WILL SAVE Rs. 750 MILLIONS ANNUALLY

Health Minister's Survey

The extension of the Malaria Control Scheme to the whole State was calculated to bring about an annual saving of a potential loss of 750 million rupees, while total annual cost of the operation would not exceed seven million rupees, stated Shri Shantilal H. Shah, Minister for Labour and Health, while requesting the Governor of Bombay to inaugurate the State-wide Malaria Control Scheme. It would thus be realised that an investment which the State had made in the past and was making in launching upon its present experiment would pay its dividend many many fold, he added.

Shri Shantilal Shah said that the malaria organization of Bombay State was one of the best and it had risen to its full height for the purpose of launching the present scheme.

The following is the text of the Health Minister's speech:

Shri Girja Shankar Bajpai, Ladies and Gentlemen,

I have the privilege of requesting the Head of the State of Bombay to inaugurate the State-wide Malaria Control Scheme and would, therefore, like to place briefly before you, and through you before the rest of the State, the problem of malaria and its control.

Malaria is an ancient disease and has claimed as its victims millions of persons including among them such names as Mahatma Gandhi, who had an attack of malaria while undergoing detention in the Aga Khan Palace, Sir Roger Lumley, an ex-Governor of Bombay, and my predecessor, Dr. M. D. D. Gilder. He lost a term at school as a result of an attack of malaria. Perhaps almost every one of us, some time or the other in course of his life, had an attack of malaria.

TOLL OF MALARIA

There are 50 lakhs of malaria cases every year in the State and about 50,000 die as a consequence of malaria. At least an equal number, if not more, become prone to attacks of other diseases, as a result of the after-effects of malaria. An attack of malaria is a national loss as it incapacitates its victims from giving to the nation his output and particularly affects the agricultural output owing to the coincidence of the malaria season with the agricultural season.

One attack of malaria results in loss in wages and earning capacity for at least six days. Every death saved from malaria would give at least five additional years of adult life. Again the loss of efficiency due to malaria is estimated at 25 per cent.

GREAT LOSS OF MANPOWER

The most important loss is that of adult man power not only for industrial purposes but for agricultural pursuits also. No price can be put on this loss as it vitally affects the growth of food in the country. The solution of the problem viz., the control of the disease which causes a loss of more than one thousand million rupees every year is not only important but urgent. Efforts were made in the past, both for cure and control of the disease but hardly the fringe of the problem could be touched till the discovery of DDT or to give to the drug the full scientific name viz. Di-Chloro Di-Phenyl Tri-Chloro-Ethane.

POTENTIALITY OF THE SCHEME

Experience of malaria control through DDT in the past has shown that the indoor residual spray brings about 90 per cent reduction in the density of the Vector Species, 66 per cent reduction in the malarial sickness

and more than 60 per cent reduction in malaria mortality. The extension of the scheme to the State is calculated to bring about an annual saving of a potential loss of 750 million rupees. The total annual cost of the operation will not exceed seven million rupees. It will thus be realized that the investment which the State has made in the past and is making in launching upon its present experiment will pay its dividend many many fold. The Government of Bombay has done some work in solving this problem in certain areas.

CONDITIONS IN 1938

My predecessor, Dr. M. D. D. Gilder, visited Kanara district in 1938 and he found "deserted villages, depopulated maths, fallow lands which once raised bumper crop and the invasion of the garden land by the forest. Children with spindle legs, bloated bellies, pallid faces and goggle eyes stared at him". He then made up his mind to establish a malaria organization which was first created in 1942 and in about 12 years time the budget had risen to Rs. 30 lakhs. In the year 1945, a small free gift of DDT from the Army enabled a pilot experiment to be carried out in Kanara. This was so successful that the malaria control organization submitted a scheme for the control of malaria in Dharwar and Kanara districts. The scheme was sanctioned by the Government and was inaugurated in 1946 by the then Chief Minister, Shri B. G. Kher. Mahatma Gandhi, who, as stated above, had been a victim of malaria, sent a special message on the occasion of the inauguration, which reads as follows:

28th September 1946
New Delhi

Dr. Gilder
Minister
Poona

Please convey wishes Dr. Viswanathan for success anti-Malaria campaign.

Gandhi

The blessings given by the Father of the Nation assured the co-operation of the public and I am sure that the present State-wide extension of the scheme inaugurated with his blessings will also have the same amount of public co-operation and the same beneficial results. The results in Dharwar and Kanara districts have been very encouraging. Spleen rate has dropped and malaria mortality has decreased considerably. As a result of the DDT spray the plague flea has been eliminated and

diarrhoea and dysentery have considerably been reduced. The tick, cattle flea, has also been eliminated with the result that the health of the cattle also shows an improvement.

The scheme which was started in the districts of Kanara and Dharwar was gradually extended to other districts and for the last three years it has been in operation in nine districts and parts of three districts. Roughly, one-third of the State has been covered so far.

EXTENSION OF THE SCHEME

The Government naturally desired to extend such a beneficial scheme throughout the State but financial considerations stood in the way of its fulfilment. The National Malaria Scheme launched by the Government of India under the programme of Indo-American Aid has not come a day too soon. It has certainly helped Bombay State in the fulfilment of its plans much earlier than it might otherwise have been. The Government of India has allotted to the State 15 units, each serving 10 lakhs of population. Normally the whole State would have required 19 such units. However, with some adjustment the Government has sanctioned a State-wide Scheme of Malaria Control, establishing 19 units including the 15 allotted by the Government of India. Practically, every malaria-stricken village in the State has been included in the scheme. Out of a total of 36,000 villages in the State altogether about 22,700 villages have been included and about two crores of people would be benefited directly by the scheme.

We are thankful to the Government of India and the Indo-American Aid which has enabled the Government of Bombay to undertake this State-wide Malaria Control Programme.

EFFICIENT ORGANIZATION

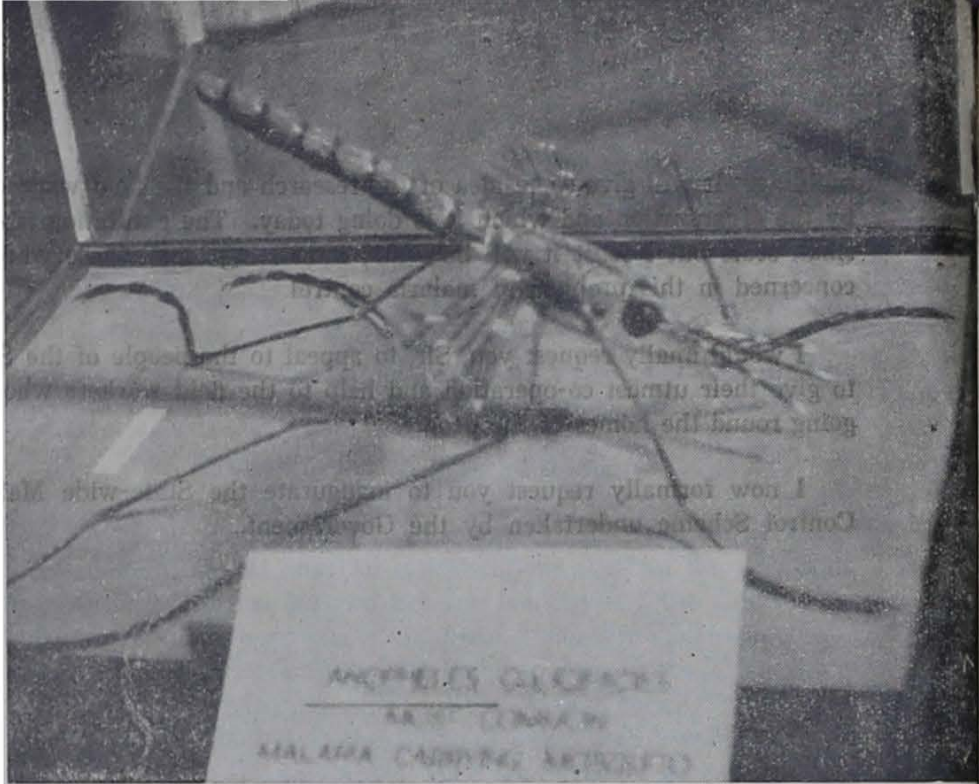
I am proud to say that the Malaria Organization of the State is one of the best and it has risen to its full height for the purpose of launching the present scheme. The personnel has been increased and given adequate training. To the present Director of Public Health and the staff which has worked under him must go the credit for making a success of this experiment. The studies and experiments which they have made are a useful contribution to malariology and will be recognized as the first great experiment in malaria control throughout Asia. The technique and methods have all been worked out from scratch and have stood the test of time. This is not the occasion to describe in detail the organizational set-up but I will invite the gentlemen present here to have a look at the small exhibition which has been arranged in this very

building. It will give some idea of the research and the field work done by the organization and which it is doing today. The exhibition is on a small scale but I trust it will be found interesting to all those who are concerned in this problem of malaria control.

I would finally request you, Sir, to appeal to the people of the State to give their utmost co-operation and help to the field workers who are going round the homes of the people.

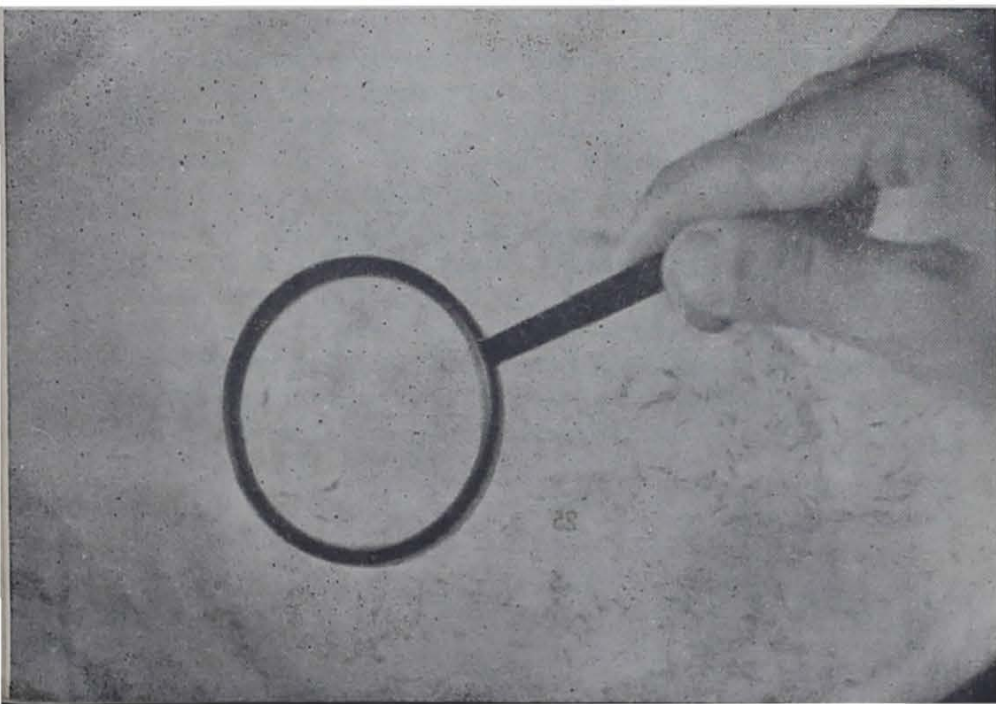
I now formally request you to inaugurate the State-wide Malaria Control Scheme undertaken by the Government.





A model of the *Anopheles Culificacies*—Most common malaria-carrying mosquitoes.

Mosquito larvae seen through a hand lens.



ELIMINATION OF MALARIA FROM BOMBAY STATE

Governor Appeals For Public Co-operation

Inaugurating a State-wide campaign against malaria—Bombay's Governor, Shri G. S. Bajpai, said that the elimination of malaria from the length and breadth of the country was a task of paramount national importance. He added, "Today, we are making the first substantial beginning; the completion should not, metaphorically speaking, be delayed beyond the morrow or the day after, if science and faith continue to receive active support from the Government and the people."

Shri Bajpai said that what was being inaugurated that day was a State-wide campaign of prevention and added, "Enough has been said of its practical benefits to encourage the hope of wide and active response. It is my hope that knowledge of the basic facts about malaria will also spread as a result of organised effort, and that, as resources permit, other measures e.g., improvement of drainage, will be undertaken."

The following is the text of the Governor's speech:
Ladies and Gentlemen,

When Shri Shantilal Shah asked me to inaugurate the Malaria Control Scheme for this State, I readily agreed, not only because of the great benefit that will accrue from the Scheme to vast numbers of people but also because, from 1923 to 1941, I was actively associated with the Department of Education, Health and Lands of the former Government of India and am glad to resume, even though honorifically, an old and deep interest which a change of duties had interrupted for 12 years.

Of the magnitude of the human and economic problem created by the wide incidence of malaria in our country, I have long been aware. A million deaths a year from this fever and a hundred million sufferers is a heavy toll to pay in terms of human life and human suffering. The debility, which is an after-effect of malaria, reduces the sufferer's capacity for work and causes a loss of national income valued at hundreds of crores of rupees annually.

RESEARCH

India, where the origin and means of transmission of malaria were first discovered, has long been in the forefront of research. Of the progress of this research, during my 18 years in the Department of Education, Health and Lands, I had first-hand knowledge. But like our medical advisers, we were in perpetual despair of ever being able to apply the results of that research to prevent completely and, if that were not possible, at least greatly to diminish the ravages of this disease. For the concept of a Welfare State in which the well-being of the people, including their health, has the highest priority, had not yet emerged, and the economy axe fell recurrently, year after year, to curtail expenditure on what are now regarded as essential services.

Indeed, outside the capital city of Delhi, no large-scale or successful scheme of malaria prevention was undertaken. Even with the development of cinchona plantations for the manufacture of quinine in India, and this was a process of heart-breaking slowness, little was achieved in relation to the scale of the need. The dead hand of financial stringency lay heavily on all such activities.

BOMBAY'S EFFORT

The Minister has given a history of the leading part that this State has played, especially since 1942, in its efforts to reduce the incidence of malaria. Those responsible for what has already been accomplished deserve our gratitude. But, what I am asked to inaugurate today is far in advance of past or recent achievement. The existing scheme of malaria control has been in operation in nine districts and in parts of three other

districts. The target now is nothing less than to spray about four million homes in the State twice every year between June and October and thus confer upon 20 million people the benefit of preventive action. It is this aspect which, I feel sure, needs greater emphasis than the expenditure involved over the next three years, roughly a sum somewhat in excess of Rs. 2 crores, of which nearly a crore will be provided by the Government of India, out of its own funds and out of the funds received as American aid and the balance by the Government of Bombay. I am not seeking to minimise the magnitude of this outlay; but it is only natural that, when speaking of disease, attention should be focussed on the relief of suffering that policy or action is expected to secure.

HOW THE SCHEME WILL WORK

The Scheme is to be operated by 19 units, each of which will have a medical officer and adequate quota of subordinate staff, five vehicles for transporting equipment and personnel and, of course, the spraying equipment itself and 40 tons of DDT. The 'modus operandi' or operational method will be to spray each house in the area of relief with DDT. In view of the area to be covered, and the need to complete an operation which must be seasonal if the onset of the mosquito is not to become uncontrollable, it will be impossible to work to a time-table which meets the convenience of every family or every individual. It is necessary, therefore, that the people put up, when necessary, with some slight inconvenience in order that the operation should be completed in time. The smell of the insecticide may prove disagreeable to some and it is apt to leave a stain or two on the walls of a home where it has been used. These, however, are minor, indeed negligible, discomforts compared to the immunity that they will bring from the physical suffering and economic loss caused by malarial fever.

PEOPLE'S CO-OPERATION

Fortunately, our people now are readier than before to take advantage of the precautionary measures provided by advances in preventive medicines. Time was when the introduction of such measures led to riots. Now even the passing pain of the prick of a needle is cheerfully borne by our villagers, when they are being inoculated against plague or cholera. Malaria prevention involves no physical pain. This fact, and the greater benefit of preventive action which I have already described will, I hope, ensure the willing co-operation of the people. Without that, neither this nor any other measure of mass welfare can succeed.

The best ally of innovation or reform of any kind is knowledge of its purpose and its processes. This is true of public health as much as of

any other aspect of national life. The Five-Year Plan speaks of the wide dissemination of knowledge among the people of simple but essential facts about disease, its cause, its prevention and its cure.

IMPORTANCE OF THE CAMPAIGN

What is being inaugurated today is a State-wide campaign of prevention. Enough has been said of its practical benefits to encourage the hope of wide and active response. It is my hope that knowledge of the basic facts about malaria will also spread as a result of organised effort, and that, as resources permit, other measures, e.g., improvement of drainage, will be undertaken. More than once, in the 19th century, attempts to link the Atlantic and the Pacific had to be abandoned because of the heavy toll that malaria took in the moist jungles in which men had to work. The first, perhaps the most important step, in making possible the construction of the Panama Canal was the elimination of malaria. Along the foot-hills of the Himalayas in our own country, there are vast tracts of rich cultivable land, which the sting of the mosquito and the resulting malaria make uninhabitable and, therefore, impossible to bring under the plough. The ultimate elimination of malaria from the length and breadth of this land is, thus a task of paramount national importance. Today we are making the first substantial beginning; the completion should not, metaphorically speaking, be delayed beyond the morrow or the day after, if science and faith continue to receive active support from Government and the people.

MALARIA CONTROL NO LESS IMPORTANT THAN INTERNATIONAL PEACE

Proposing a vote of thanks Dr. D. K. Viswanathan, Director of Public Health, Government of Bombay, said that the cause of malaria control was no less important than international peace and pledged devoted service not only by himself but also by his staff in this great enterprise.

The following is the text of the speech of the Director of Public Health:

Ladies and gentlemen,

I have now a most pleasant duty to perform. At this hour when you, Sir, have given us the command to implement the Malaria Control Scheme throughout the State of Bombay as a part of the National Malaria Control Programme, nearly 10,000 homes are being sprayed with DDT in 75 different villages in Bombay State. Every day hereafter about 50,000 homes will be sprayed.

We are deeply honoured that despite your multifarious duties of far greater national importance you have found the time to grace this occasion and given us your words of advice and, if I may say with

respect, of wisdom. You, Sir, have been good enough to indicate how very appropriate it was that this service should have the privilege of being inaugurated by you. The great research that has been carried out in this country in the field of malaria during 18 years of your stewardship of the Department of Health as a member of the Government of India has today culminated in the practical field of service to man.

May I also submit that this service is a joint enterprise of two great nations? Who in India has striven more for the cause of amity and goodwill between these two great nations? We, therefore, feel that the ceremony of inauguration we have witnessed today has not only received the blessings of the Head of the State but also symbolises Indo-American goodwill in a cause which is no less important than international peace. We will not content ourselves with any formal expression of our gratitude but will attempt to deserve your kindness through devoted service in this great enterprise.

The Minister for Health, Shri Shantilal Shah, has told us what great part Dr. Gilder, his predecessor in office, has played in the establishment and evolution of the Malaria Organization in this State. The thanks of one and all of us present here and of the people of this State are due to him for his foresight and statesmanship in having created and developed this instrument of service. An able administrator such as Dr. Gilder was, has been succeeded by a person with no less devotion in the cause of health. Limitations of office preclude me from giving full vent to our feelings on this occasion. I sometimes wonder what this Department has done to deserve such a special grace of providence. The succession of such a remarkable stewardship in the field of public health is perhaps a great measure of recompense for the lack of adequate attention to health work in the past.

I must on this occasion pay my tribute to Sir Gordon Covell, the former Director of the Malaria Institute of India, who was perhaps the first to lay the foundation for a practical malaria control programme in this country following the splendid researches carried out by his predecessors in office, Sir Rickard Christophers and Col. Sinton. The Malaria Organization of Bombay State may be practically said to be a child of his creation. I am sure that when he hears of this ceremony it will gladden his heart that his child has reached productive adulthood. To his successor in office Col. Jaswant Singh who is unable to be present today we are no less grateful. It is to his great drive and enthusiasm in the cause of national malaria control that we owe the institution of this service.

DREAM COMES TRUE

To the people of the American nation and its Government who have so generously come forward with free supplies of DDT, transport and equipment we are profoundly grateful. Three years ago when I had the privilege of recording the progress of malaria control in this State in the form of a book I gave expression to what I then considered to be no more than a dream that such a service deserved the support of President Truman's Point Four Programme. Little did I then imagine that such a dream would come true in such a short time. Such a realization has been possible due to the efforts of a number of great American friends, such as Mr. Chester Bowles, former American Ambassador in India and His Excellency the present American Ambassador in India, Mr. Clifford Wilson, Director of the Technical Co-operation Administration Programmes in India, whose representative, Mr. Aitken, we are glad to welcome amidst us today. Dr. Estella Warner, Consultant in Health in the Ministry of Health and, above all, Dr. R. B. Watson of the Rockefeller Foundation to whose great inspiration and foresight the implementation of this programme is largely due.

This great scheme would never have seen the light of day but for the missionary zeal and energy of our beloved Minister for Health of the Government of India, Rajkumari Amrit Kaur. Her standing as a health adviser in the field of international health and its assemblies is well-known. It is on account, solely, of her being at the helm of health administration in the country that this programme has been sponsored jointly by the Government of India and the American Government. Our most profound thanks are due to her, as well as to Shrimati Maragatham Chandrasekhar, the Deputy Minister for Health of the Government of India.

Our thanks are due to Dr. K. C. K. E. Raja, the former Director-General of Health Services and his successor in office Col. C. K. Lakshmanan, who vigorously canvassed the support of the Government of India for the implementation of this scheme.

We are also grateful to the members of the Planning Commission and in particular to the member in charge of Health, Shrimati Durgabai Deshmukh, for giving a high priority for this scheme in the National Five-Year Plan and to Dr. Lakshminarayana, the Health Adviser to the Planning Commission, who has played a notable part in the furtherance of this scheme.

To the World Health Organization our very special thanks are due. That Organization put malaria in the forefront of its programmes, has sent out several demonstration teams to several countries including India and has most generously come forward with assistance in collaboration

with the UNICEF by way of free supplies of DDT. To both these Organizations, therefore, we are profoundly grateful. I should specially acknowledge the services of Col. Mani, the Regional Director of the South East Asia office of the World Health Organization, and Mr. T. G. Dawies, Head of the Combined Mission for Afghanistan, India and Ceylon of the UNICEF.

We deeply appreciate the great interest evinced by all the guests who have assembled here this evening and their blessings will greatly hearten us in our task. We are no less grateful to all sympathisers for this great cause who, though they are unable to be present on this occasion, have sent us their messages of congratulations and blessings for the success of this effort.

We are thankful to Dr. Desai, the Principal of the B. J. Medical College for helping us in every way to celebrate this function as also to Shri Lonkar, the Executive Engineer, P.W.D. and his assistants. To Dr. Gayakwad, Superintendent of Gardens, Government House, our special thanks are due for the help in decorations.

We are also grateful to the Principal of the Gandharwa Maha Vidyalaya, Poona and to his lady pupils who will shortly give us the National Anthem. We are also thankful to the Police authorities for placing the services of the Police band at our disposal this evening and to the Directorate of Publicity for help in several ways.

I almost forgot to express my thanks to Dr. T. Ramchandra Rao, for I am not yet used to the fact that he is at the moment not with us in the Department, a feeling in which I am greatly encouraged both by him and his chief Dr. Austin Kerr. Dr. Ramchandra Rao has helped us greatly in putting up the exhibition which the Minister for Health has already invited you all to visit. To Dr. Kerr also our thanks are due not only for letting us have Dr. Rao's services on such occasions but for having goaded us into the publication of DDT Operation Manual which lays down clearly and fully the duties of every member of the great army that has been conscripted into service this evening. There may yet be others whom I may have failed to mention and if so it is purely accidental. I thank one and all who have helped us in this ceremony.

MESSAGES RECEIVED ON THE OCCASION

1. Dr. Rajendra Prasad, President of the Indian Republic.
2. Shri Jawaharlal Nehru, Prime Minister of India.
3. Shri Morarji R. Desai, Chief Minister of Bombay State.
4. His Excellency George V. Allen, American Ambassador for India, New Delhi.
5. Shrimati Maragatham Chandrasekhar, Deputy Minister for Health, Government of India.
6. Dr. M. D. D. Gilder.
7. Shri M. M. Naik-Nimbalkar, Minister for Public Works, Bombay.
8. Shri B. G. Kher, High Commissioner for India, London.
9. Dr. Jivraj N. Mehta, Minister for Finance, Prohibition and Industries, Bombay.
10. Sir Gordon Covell, Former Director of Malaria Institute of India.
11. Dr. Paul F. Russell, Rockefeller Foundation.
12. Dr. Robert Briggs Watson, M.D., Director for the Far Eastern Region, Rockefeller Foundation, Bangalore.
13. Col. C. K. Lakshmanan, Director General of Health Services, New Delhi.
14. Col. Jaswant Singh, Director, Malaria Institute of India, New Delhi.
15. Dr. K. C. K. E. Raja, Retired Director General of Health Services and Officer on Special Duty, Ministry of Health, New Delhi.
16. Dr. T. Lakshminarayana, Adviser, Health Programmes, Planning Commission, New Delhi.
17. Dr. E. J. T. McWeeney, Acting Regional Director, World Health Organization, Regional Office, South East Asia, New Delhi.
18. Joint Message from Dr. Pampanna and Col. Mani of the World Health Organization.
19. Dr. T. G. Davies, Chief of Combined Mission for India, Afghanistan and Ceylon of the UNICEF, New Delhi.
20. Sir A. Lakshmanaswami Mudaliar, Vice-Chancellor, Madras University.

21. Shri A. B. Shetty, Minister for Health, Madras.
22. Dr. B. C. Roy, Chief Minister of West Bengal.
23. Dr. Macfadyen, Chairman, Ross Institute, London.
24. Prof. G. Macdonald, Ross Institute of Tropical Hygiene, London.
25. Prof. P. A Buxton, School of Tropical Medicine, London.
26. Dr. F. L. Soper, Regional Director for America, World Health Organization, Washington.
27. Dr. Robert L. Zoble, Acting Chief, Division of International Health, Public Health Service Department of Health and Education, Washington.
28. Dr. T. Wilson, Senior Malaria Research Officer, Institute for Medical Research, Kuala Lumpur, Malaya.
29. Dr. Warren, Director, Medicine and Public Health Division, Rockefeller Foundation, New York.
30. Shrimati Indumati Chimanlal, Deputy Minister for Education, Bombay.
31. Shri D. N. Wandrekar, Deputy Minister for Backward Classes, Bombay.
32. Shri M. D. Bhansali, Chief Secretary to Government of Bombay.
33. Justice N. H. C. Coyajee, Bombay High Court.
34. Collector of Dangs.
35. The President, District Local Board, Kolaba.
36. The President, District Local Board, Banaskantha.
37. The President, District Local Board, Baroda.
38. The President, Dhulia Municipality.
39. The President, Broach Municipality.
40. The President, Sawantwadi Municipality.
41. The President, Ahmednagar Municipality.
42. The Civil Surgeon, Sabarkantha.
43. The President, Bet Municipality.

THE MESSAGES

Message from Dr. Rajendra Prasad, President of the Indian Republic.

On the inauguration of the Scheme of the National Malaria Control of the State of Bombay, I send my best wishes for the success of the scheme. India is one of the worst sufferers from malaria and the importance of the National Malaria Control Programme can hardly be over-emphasised. It is, therefore, heartening to know that the Government of Bombay is determined to intensify the campaign with a view to giving every malaria-stricken village in the State the benefit of modern methods of control.

Message from Shri Jawaharlal Nehru, Prime Minister of India, to the Minister for Health, Bombay.

I send you my good wishes on the occasion of your extending the malaria control scheme to every district of Bombay State.

Message from Shri Morarji R. Desai, Chief Minister of Bombay.

Prevalence of malaria has been one of the major scourges with which we had to contend in pursuance of our intention to promote better standards of public health and hygiene in the State of Bombay. We are now very happy indeed to be able to fortify our efforts by launching upon a Malaria Control Scheme under the T.C.A. programme throughout

the State of Bombay. I trust that the people of Bombay State will neglect no means to make this scheme a success.

Message from His Excellency George V. Allen, American Ambassador for India, New Delhi.

My warmest congratulations on this important undertaking and my every good wish for its success.

Message from Shrimati M. Chandrasekhar, Deputy Minister for Health, Government of India, New Delhi.

The National Malaria Control Programme, the largest of its kind in any part of the world, designed to afford protection from malaria to 125 million people scattered in almost all the States of the Union, came into effect from the 1st April 1953. The Government of India, the Government of the United States of America and the various State Governments are co-operating in the enterprise. The Bombay State, which has been a pioneer in tackling the rural malaria problem in a big way, is inaugurating today State-wide Anti-malaria Programme as a part of the National Malaria Control Programme. Judging from the results already achieved, I feel confident that at the conclusion of the programme, malaria will have very largely ceased to exist as a public health problem in Bombay State. I have very great pleasure in wishing Bombay State all success in their campaign.

Message from Dr. M. D. D. Gilder.

Thanks to the efforts of the Hon'ble Rajkumari Amrit Kaur and to a donation from Point Four Programme of the Government of the United States of America, the ambition of the Government of Bombay and of its Director of Public Health to rid Bombay State of the scourge of malaria is being realised. May the scheme that His Excellency is inaugurating today for ever banish malaria from Bombay State and ultimately from India.

Message from Shri M.M. Naik-Nimbalkar, Minister for Public Works, Bombay.

Malaria has been a scourge of our country and so I wish every success to the State-wide Campaign towards its complete annihilation.

Message from Shri B. G. Kher, High Commissioner for India, London.

Very glad to know State-wide Malaria Control Scheme being inaugurated by Governor on June 3. Wish Scheme all success.

Message from Dr. Jivraj Mehta, Minister for Finance, Prohibition and Industries, Bombay.

With the inauguration of the State-wide Malaria Control we enter upon a new phase of war on malaria and all those mosquito and fly-borne diseases which are responsible for considerable mortality and still greater morbidity in the State. I wish success to these efforts and thus speed up those measures so necessary for the health of the Nation.

Message from Sir Gordon Covell, former Director of Malaria Institute of India.

I returned from a tour in the U.S.A. this week and found your letter of the 20th May, alas, it is now too late to send you a message for the inauguration of the Malaria Control Scheme throughout Bombay State.

I would of course gladly have done so. I need not tell you how interested I am in the Scheme. Please keep me informed of its progress from time to time.

Message from Dr. Paul F. Russell, M.D., Rockefeller Foundation.

I regret that I did not have the letter in time to send you a message on the occasion of the formal inauguration of your State-wide Malaria Control Programme on June 3. But you most assuredly have my best wishes. You and T. R. Rao led the way and the fruits of your work are abundant and good.

Message from Dr. Robert Briggs Watson, M.D., Director for the Far Eastern Region, Rockefeller Foundation, Bangalore.

Bombay State was the first in India to protect a large proportion of its population from the debilitating effects of malaria, through the use of modern insecticides. It seems quite fitting, therefore, that Bombay State should also lead other states in extending the benefits of malaria control to all its people; and, I may say, quite in keeping with its record of pre-eminent progressiveness.

Message from Col. C. K. Lakshmanan, Director General of Health Services, New Delhi.

The National Malaria Control Programme is one of the largest programme we have undertaken and I sincerely hope that it will be a great success throughout India and in particular in Bombay State. Under

your able guidance and supervision malaria control work in Bombay State has been going on efficiently for the last many years and I feel confident that the State-wide programme which you are now going to launch will be a great success.

Message from Col. Jaswant Singh, Director, Malaria Institute of India, New Delhi.

As in other Nation-building activities it is for State of Bombay to lead the sister States in the inauguration of the State-wide Malaria Control Programme. The remaining States may be able to emulate Bombay's example. Guided as it is by the rich experience and wide knowledge of an eminent Malariologist of the standing of Dr. Viswanathan, I entertain no doubts about its ultimate success. On behalf of the Malaria Institute of India I wish to take this opportunity to assure the State Government and its people that not only with our good wishes but with ungrudging services we are behind them in this great effort.

Message from Dr. K. C. K. E. Raja, Retired Director General of Health Services and Officer on Special Duty, Ministry of Health, New Delhi.

Bombay State has for many years taken a keen interest in developing a comprehensive programme for the eradication of malaria and has achieved considerable success in this direction. The National Malaria Control Campaign, which is being inaugurated in the State by the Governor on the 3rd of June, will undoubtedly give a further impetus to the movement. I have no doubt that, with the sustained effort that Bombay Government has throughout given to this campaign and with the able guidance of its Director of Public Health, Dr. D. K. Viswanathan, who has devoted the major part of his public service to the cause of malaria in different parts of India, the success of the intensified effort now being promoted is definitely assured.

Message from Dr. T. Lakshminarayana, Adviser, Health Programmes, Planning Commission, New Delhi.

Bombay has led the rest of India in malaria control work. The State has carried out extensive programmes and has achieved truly remarkable results. The credit goes to Dr. D. K. Viswanathan, Director of Public Health, Bombay, for organising this work and for initiating the concept of a national programme of malaria control. May I wish the function all success and hope that as a result of the scheme total control of malaria in the State will be achieved?

Message from Dr. E. J. T. McWeeney, Acting Regional Director, World Health Organization, Regional Office, South East Asia, New Delhi.

There is, I think, a deep symbolic meaning in this occasion. The World Health Organization was established as an Interim Commission in July 1946. In that same month and year you began campaign to control malaria through the use of residual insecticides. The methods you chose were taken up by us as our world-wide international activity got under way.

On the world scale, too, the battle-lines have surged forward. From country to country in all parts of the world the challenge is being taken up. Where only a few years ago malaria still raged almost unhindered and certainly unchecked, it is today being brought under effective control.

In your own State and country, as in the world as a whole, we are now only beginning to see the positive effects, both humanitarian and economic, which this revolution in the fight against malaria will have. Yet the effects are already tremendous. Even the most hard-headed materialist can no longer afford to ignore one simple fact to which effective malaria control points unmistakably and unequivocally. That fact is that public health measures, properly conceived and properly carried out, pay dividends in actual cash as well as in terms of fuller, more abundant living for the people as a whole. And the people — the plain, honest, toiling people — have seen with their own eyes and felt in their own bodies the benefits which malaria control has brought to them. It is their support which has made possible the mounting tide of success in this age-old struggle.

Joint message from Dr. Pampanna, and Col. Mani, World Health Organization, Geneva.

On the occasion of a State-wide Malaria Control Programme we send congratulations and best wishes to Bombay for being first State in India to undertake hundred per cent cover against malaria.

Message from Dr. T. G. Davies, Chief of Combined Mission for India, Afghanistan and Ceylon of the UNICEF, New Delhi.

UNICEF offer cordial wishes for success new scheme as crowning Bombay State's already notable achievements in malaria control. . . .

Message from Sir A. L. Mudaliar, Vice-Chancellor, University of Madras.

It is a matter of sincere gratification that Bombay State has launched on a State-wide Malaria Control Programme, and that this campaign is to be inaugurated by His Excellency the Governor at Poona.

Malaria has always been a dreaded disease in the tropics and has more victims than any other disease besides resulting in an economic loss to the country which cannot be easily reckoned. Yet this disease is preventable and with modern weapons of scientific precision can be entirely eradicated from any country. Brazil, Sardinia and many other countries which were till recently the reservoirs of malaria have been freed from this disease. I am very happy therefore that Bombay State has taken up this challenge and I trust that it will be the first among the Indian States to prove that malaria can be eradicated in an entire State and the health and vigour of the population thus protected.

I wish this campaign complete success.

Message from Shri A. B. Shetty, Minister for Health, Madras.

I am glad the Governor of Bombay will be inaugurating your State-wide Malaria Control Scheme on the 3rd of next month. Bombay has done remarkably good anti-malaria work. The extension of the scheme will, I am sure, be welcomed by the people as a very useful measure of preventive campaign.

Message from Dr. B. C. Roy, Chief Minister of West Bengal, Calcutta.

My good wishes to the National Malaria Control Organization in Bombay State. It is refreshing to see such organisations grow from strength to strength.

Message from Dr. Macfadyen, Chairman, Ross Institute, London.

Ross Institute Standing Committee and Staff congratulate Bombay Government on past brilliant example of extensive malaria control and offer good wishes for extension to entire State.

Message from Prof. G. Macdonald, Ross Institute of Tropical Hygiene, London.

I need hardly say that the good wishes of the staff are very sincere indeed and we look forward to quoting even more brilliant successes than in the past.

Message from Prof. Buxton, F. R. S., Professor of Entomology, London School of Tropical Medicines and Hygiene.

Interested to hear of inauguration. Sincere wishes for success.

Message from Fred L. Soper, Director Pan American Sanitary Bureau, World Health Organization, Washington D. C.

It is indeed a pleasure to learn that a State-wide Malaria Control Programme in Bombay State is now being inaugurated. I sincerely congratulate you and through you the Government of the State on this occasion.

Malaria is a disease which can be eradicated from many if not from all regions of the world but to get eradication one must work on an ever expanding programme. Surely this State-wide programme will lead to a Nation-wide programme in the near future.

Message from Dr. Robert L. Zoble, Department of Health, Education and Welfare, United States Government, Washington.

Dr. Louis L. Williams joins us in congratulations on the inauguration of so outstanding a programme for Malaria Control. We are sure this will eradicate malaria and all India will ultimately benefit from the resulting great improvement to the health of the entire population of Bombay State.

Message from T. Wilson, Senior Malaria Research Officer, Institute for Medical Research, Kualalumpur.

I am delighted to hear the good news that you are embarking on a State-wide Malaria Control Programme. This is in itself a striking tribute to the success already achieved by your Bombay Malaria Organisation in its efforts to abolish malaria.

My hearty congratulations to you, to Mr. T. R. Rao, and to the other officers concerned. I shall follow with great interest the progress of this most important undertaking.

Message from Dr. Warren, Director, Medicine and Public Health Division, Rockefeller Foundation, New York.

In recognition of the auspicious occasion of inaugurating a State-wide Malaria Control Programme, Rockefeller Foundation's Medicine and Public Health Division extends heartiest congratulations to Bombay State and to you without whose efforts such progress would have been impossible.

Message from Shrimati Indumati Chimanlal, Deputy Minister for Education, Bombay.

I convey my best wishes to the function.

Message from Shri D. N. Wandrekar, Deputy Minister for Backward Classes, Bombay.

I wish every success to the function and the anti-malaria scheme.

Message from Shri M. D. Bhansali, Chief Secretary to the Government of Bombay.

I am glad to note that it would be possible to cover the entire State through the Malaria Control Scheme. I take this opportunity of wishing it all success.

Message from Justice N. H. C. Coyajee, Bombay High Court.

I wish the State-wide Anti-malaria Scheme all success.

Message from Collector of Dangs.

Wish it success.

Message from the President, District Local Board, Kolaba.

I wish complete success to the proposed ceremony.

Message from President, District Local Board, Banaskantha.

I wish entire success to the Anti-Malaria Scheme.

Message from President, District Local Board, Baroda.

I extend my sincere wish of success in the scheme undertaken by the Government of Bombay.

Message from President, Dhulia Municipality.

I wish every success to the Scheme and ceremony as well.

Message from President, Broach Municipality.

I wish the function a success.

Message from President, Sawantwadi Municipality.

I wish every success.

Message from President, Ahmednagar Municipality.

I wish grand success to the function.

Message from Civil Surgeon, Sabarkantha District.

My very best wishes on this occasion.

Message from President, Bet Municipality.

I wish success State-wide Anti-malaria Scheme inaugurated by Governor of Bombay.

PROMISING RESULTS OF CONTROL MEASURES IN THE STATE

During the first two years of the operation of the State-wide campaign of malaria control, it was expected that as many as 40 lakh cases of malaria could be saved every year, besides other collateral benefits such as elimination of plague, flyborne diarrhoea and dysentery, stated Shri Shantilal H. Shah, Minister for Labour and Health, broadcasting a talk, in Hindi, on "Malaria Control" from the Bombay Station of All India Radio on June 9, 1953.

The following is the text of the Health Minister's broadcast :

At 5-30 p.m. on the 3rd instant Shri Girja Shankar Bajpai, the Governor of Bombay, inaugurated the scheme of State-wide control of malaria as part of the National Malaria Control scheme launched by the Government of India under a programme of Indo-American Aid. At that hour, about 10,000 homes were simultaneously sprayed in several villages throughout the State of Bombay with DDT by special staff employed by the Government. Every day thereafter during the malaria season, approximately 60,000 homes will be sprayed throughout the State.

One round of application of DDT will approximately take about 60 working days for covering over 22,700 malaria-stricken villages of this State to which this scheme has been extended. In each round, therefore, nearly 40 lakhs of homes will be sprayed. This would approximately benefit about 2 crores of persons who are reckoned to live in the malaria-stricken villages in this State. Indirectly, however, the entire population of Bombay State reckoned at about 3½ crores would derive the benefit of this scheme, not to speak of the casual visitors from other parts of the country.

PUBLIC CO-OPERATION ESSENTIAL

Altogether, this is one of the most extensive and utilitarian schemes adopted by the Government of India in the National Five-Year Plan. No government scheme can yield full dividends without the wholehearted co-operation of the people of the State. Past experience has shown that in areas in which the scheme has been in operation the co-operation of the public has been whole-hearted and unstinted. There is, therefore, no doubt in my mind that the same measure of co-operation will be forthcoming in the State-wide scheme now inaugurated.

RAVAGES OF MALARIA

Malaria is an outstanding public health problem in Bombay State as in the rest of the country. Between 50 and 60 lakhs of people are reckoned to suffer at least from one attack of malaria every year and about 50 to 60 thousand persons die directly due to this disease. Though not a very great killer, malaria devitalises people and renders their output less productive. Abortions, miscarriages, infantile deaths, anaemia, pre-disposition to other inter-current diseases like tuberculosis, all these constitute some of the dire effects of this disease. These do not lend themselves to precise statistical computation. But their magnitude is well-known to most of us. Above all, malaria has a special tendency to be associated with reduced agricultural output. What is more, the agricultural season and the malarial season more or less coincide. Some of the most fertile lands in the State have remained fallow on account of lack of manpower or temporary incapacity due to this disease during the agricultural season. The economic loss brought about by this disease is therefore considerable.

PROMISING RESULTS

The Government of Bombay has made some notable progress in the past in the field of malaria control. Prior to the State-wide extension of this scheme, malaria control was in operation in about 9

districts and parts of a few other districts. More than 12 lakhs of homes were under spray benefitting more than 60 lakhs of people directly and over one crore indirectly. During each of the last two years more than 12 lakh cases of malaria have been saved. Along with the control of malaria the application of DDT has also helped in the virtual elimination of plague on account of the destruction of the rat-flea which transmits the disease to man. There is also some indication that fly-borne diarrhoea and dysentery have been reduced.

MORTALITY RATE REDUCED

In Kanara district in particular mortality rate has been materially reduced. Prior to 1946, three out of every thousand people used to die of malaria in that district. At present less than one out of every 2,000 persons is reported as dying of malaria. Measures which have been adopted in Dharwar and Kanara districts have substantially benefited the family budget by reducing the expenditure on medical treatment. Even the health of the cattle has shown some improvement by way of freedom from the festering sores caused by the insect tick which infest them. This insect is also destroyed by DDT.

Based on this past experience, the Government hopes that even during the first two years of operation of the State-wide scheme of malaria control, as many as 40 lakhs of cases of malaria would be saved every year. The other collateral benefits mentioned above would also be experienced throughout the State.

WETTABLE DDT POWDER

The scheme consists of applying DDT as a wettable powder in every home in every malaria-stricken village twice during the year, once in June-July-August and again in September-October-November. It is no doubt not compulsory by any legal provision that every householder should agree to get his house sprayed. As, however, malaria is transmitted from man to man through an insect which respects no caste, no community, no rank, no status and no geographical or proprietary frontier, it is necessary that the apathy of the few should not endanger the health of the many.

STAFF WELL-TRAINED

I, therefore, make an earnest appeal to every householder to place no difficulty whatsoever in the rapid and complete spraying of his house by the staff employed by the State. In an extensive programme of this kind,

the day-to-day work has been specifically laid down. And delay, interference or postponement of the schedule fixed for any day or hour would inevitably dislocate the entire programme. The co-operation of the householder is therefore most vital. The staff have been fully trained as regards the method of making the spraying fluid, the manner of its application, the places where it has to be applied and the amount that has to be applied. These instructions have been imparted as a result of considerable experience. Provision has also been made for day-to-day supervision by trained staff.

The householder should therefore not attempt to impose any particular view of his own in the day-to-day work of the trained staff. For instance, sometimes requests are made that DDT should be sprayed over dung heaps, latrines, urinals, drains, etc. All this is wholly unnecessary. While the staff would no doubt look upon themselves as the servants of the State and therefore of the people and would accommodate their convenience to the extent possible, I appeal to every householder not to cause any delay by reason solely of some other time being more convenient to him for getting the house sprayed.

DO NOT WIPE OFF DDT DEPOSIT

Hitherto DDT was being applied in the form of an emulsion. Further work in Western countries has shown that when DDT is applied in the form of a wettable powder it yields better results. The supply of DDT that has been made by the Government of India for the State-wide scheme is in the form of a wettable powder. Obviously, best use should be made of the formulation that has been supplied. In view therefore of the undoubted good results which will ensue, namely freedom from malaria and improved general health of both men and cattle, I appeal to every householder not to mind the slight aesthetic disability arising out of the DDT powder smudging the walls or other sprayed surfaces. A small disability such as this should be cheerfully borne for the sake of the great good that will result especially in safeguarding the health of children who are most vulnerable to malarial attacks.

I mention this particular point to meet in advance possible public criticism that the formulation used hitherto left no such deposit on the sprayed surface. While there may be justification for such criticism, the staff are not responsible for the changeover in the formulation which is made primarily because the new formulation is reported by technical men to be more effective, and it is the formulation that has been made available for extensive use by this as well as other States as part of the National Malaria Control Programme.

From what I have said it will be equally obvious that no attempt should be made by the householder to wipe off the deposit of DDT powder on the sprayed surfaces, because such an act on his part would defeat the very purpose of the application of DDT. It is only if the DDT particles are allowed to remain on the sprayed surfaces that when mosquitoes coming to bite persons at night rest on these walls they will be destroyed by contact with the particles of DDT. The removal of the sprayed DDT powder would therefore defeat the purpose of spraying DDT, viz., destruction of mosquitoes since it is through destruction of mosquitoes that malaria is sought to be controlled in this scheme.

The sole aim of this scheme is to serve you. I, therefore, appeal to you to help the Government to serve you.

Jai Hind.

MALARIA IN BOMBAY STATE

WHAT BOMBAY GOVT. IS DOING IN 1953-54

UNDER NATIONAL MALARIA CONTROL PROGRAMME

ENTIRE STATE TAKEN UP FOR CONTROL

POPULATION:

DIRECTLY PROTECTED	20,000,000
INDIRECTLY PROTECTED	35,900,000

BUDGET:

BY BOMBAY STATE Rs. 3,456,000

BY T.C.A. (U.S.A.) ASSISTANCE THROUGH
GOVT. OF INDIA Rs. 3,594,000

TOTAL .. Rs. 7,050,000

PER CAPITA EXPENDITURE:

DIRECTLY PROTECTED 6.6 ANNAS

INDIRECTLY PROTECTED 3.2 ANNAS

INTERNATIONAL ORGANIZATIONS:
T.C.A., W.H.O., UNICEF, R.F

MINISTRY OF HEALTH,
GOVT. OF INDIA

MINISTRY OF HEALTH
BOMBAY STATE

DIRECTORATE OF
HEALTH SERVICES

DIRECTOR OF PUBLIC
HEALTH,
GOVT. OF BOMBAY

DIRECTOR, MALARIA
INSTITUTE OF INDIA

A D.P.H. (MALARIA)

MALARIOLOGIST

H.Q. LABORATORY

CONTROL UNITS

MALARIA ORGANIZATION BOMBAY STATE

NATIONAL MALARIA CONTROL PROGRAMME

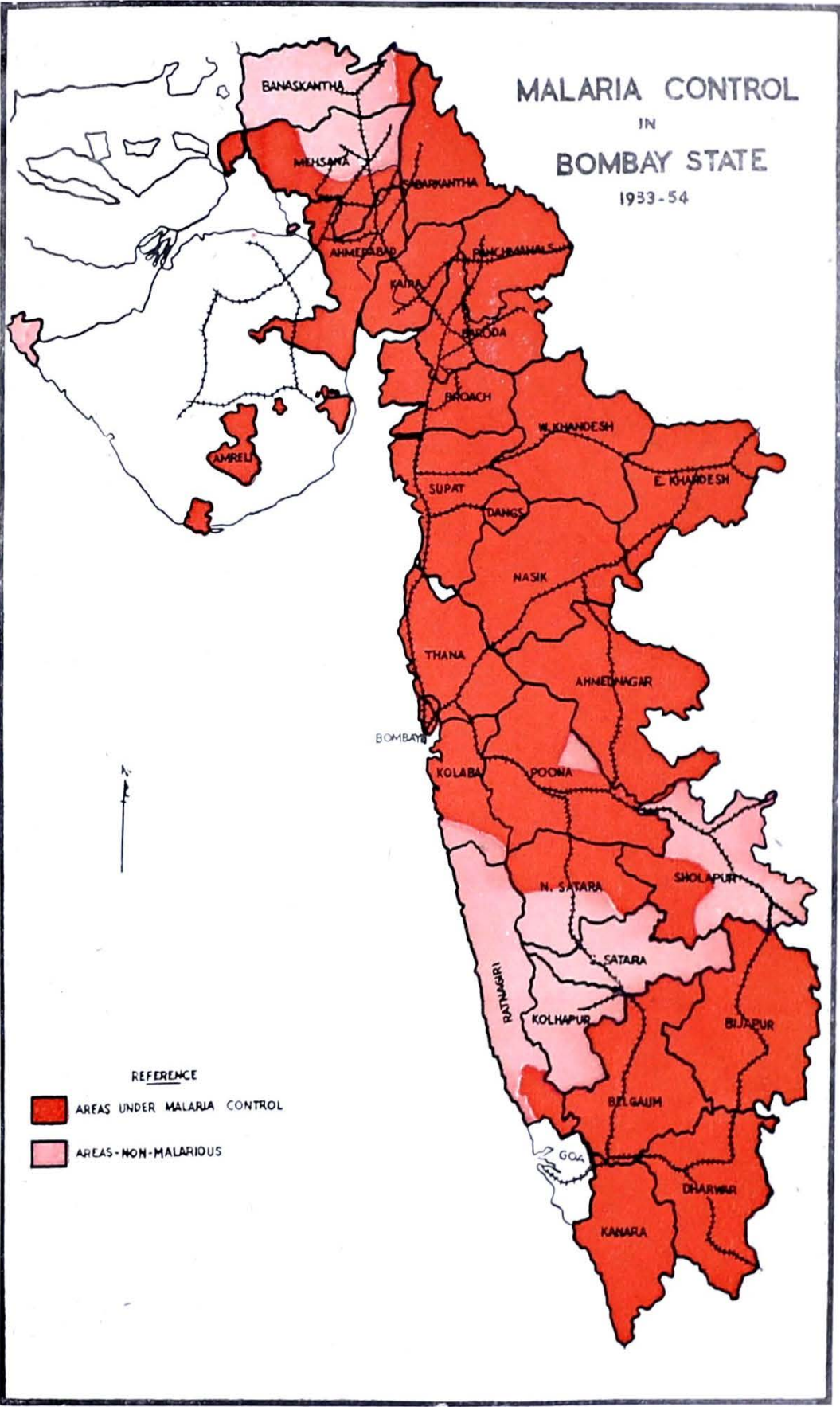
1953-54

MEDICAL OFFICERS	2
JR. ENTOMOLOGIST	1
ENT. ASSISTANTS	2
A.M.Os.	2
MAL. ASSISTANT	4
ENG. SUPERVISOR	1
INSECT COLLECTOR	12
CLERICAL STAFF	9
CLASS IV STAFF	11

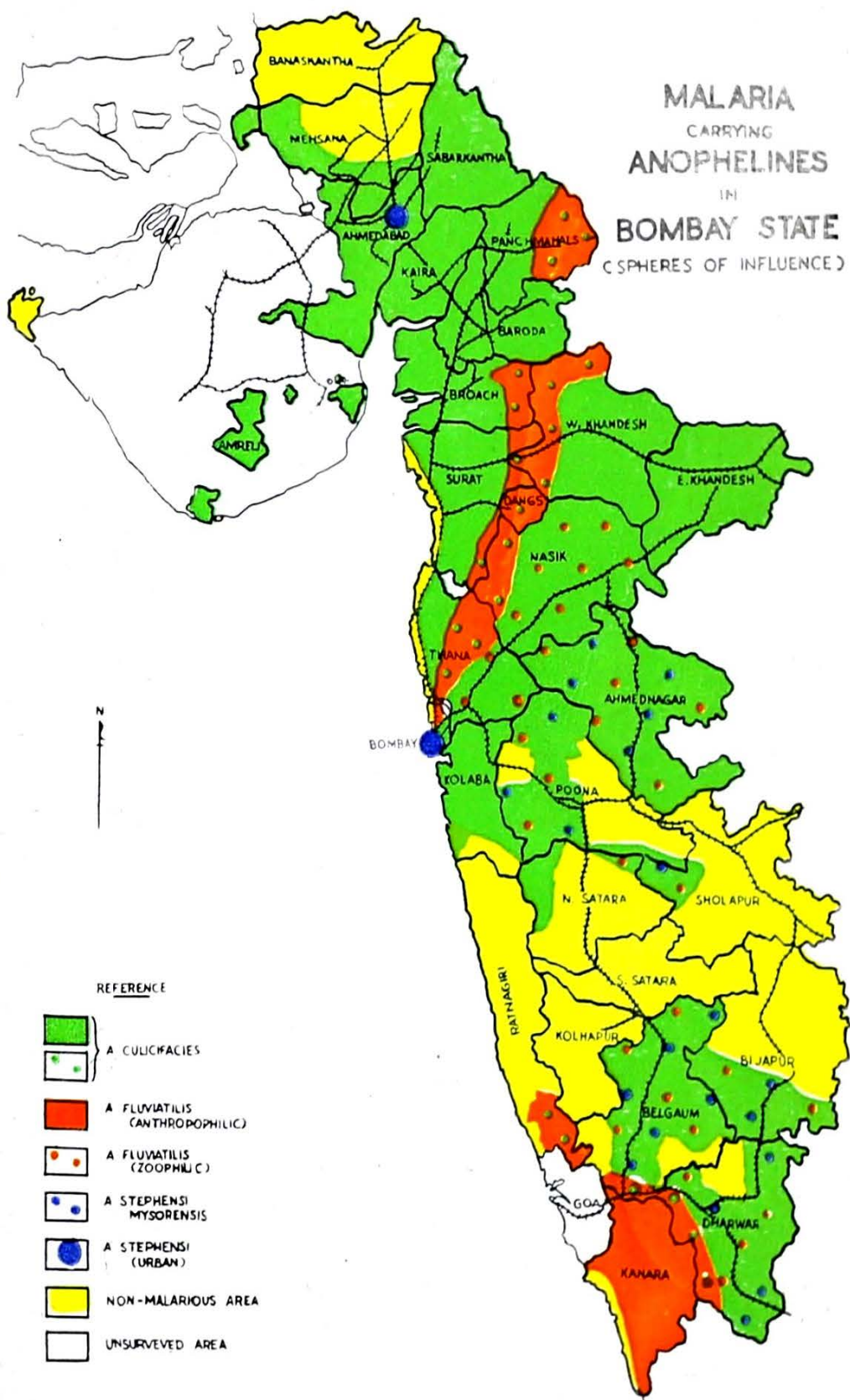
NO.	DISTRICTS	MEDICAL OFFICER OF HEALTH	MEDICAL OFFICER	ASSTT. MEDICAL OFFICER	MALARIA SUPERVISORS	MALARIA INSPECTORS	CLERKS	DRIVERS	CLEANERS	INSECT COLLECTORS	PEONS & CHOWKIDARS	HAVILDARS	SEPOYS
1.	KANARA	2	—	—	4	—	3	5	4	2	7	10	50
2.	DHARWAR	2	—	1	4	—	3	5	4	2	9	20	100
3.	BIJAPUR	*	—	1	—	2	1	3	2	2	3	6	30
4.	THANA	—	1	1	4	4	3	5	4	2	7	24	120
5.	W. KHANDESH ..	—	1	1	4	4	3	5	4	2	7	22	110
6.	PANCHMAHALS ..	—	1	1	4	4	3	5	4	2	7	22	110
7.	AHMEDABAD	—	1	1	—	4	3	5	4	2	7	22	110
8.	KAIRA	—	1	1	—	6	3	5	4	2	7	22	110
9.	BELGAUM	—	1	1	4	4	3	6	5	2	6	23	115
10.	POONA, SHOLAPUR & SATARA N.	—	1	1	4	4	3	5	4	2	7	20	100
11.	KOLABA	—	1	1	3	3	3	4	4	2	6	20	100
12.	AHMEDNAGAR	—	1	1	4	4	3	5	4	2	7	20	100
13.	NASIK	—	1	1	4	4	3	6	5	2	6	24	120
14.	E. KHANDESH	—	1	1	4	4	3	5	4	2	7	20	100
15.	SURAT I	—	1	1	3	3	3	5	4	2	6	18	90
16.	SURAT II & DANGS	—	1	1	3	3	3	4	4	2	6	18	90
17.	BROACH	—	1	1	3	3	3	4	4	2	6	18	90
18.	BARODA	—	1	1	4	4	3	5	4	2	5	20	100
19.	SABARKANTHA, AMRELI, MEHSANA, BANASKANTHA	*	—	2	3	3	2	4	4	2	6	18	90

*D.H.O. IN CHARGE








MALARIA CONTROL IN BOMBAY STATE 1933-54



MALARIA CARRYING ANOPHELINES IN BOMBAY STATE (SPHERES OF INFLUENCE)



REFERENCE

-  } *A. CULICIFACIES*
-  } *A. FLUVIATILIS*
(ANTHROPOPHILIC)
-  } *A. FLUVIATILIS*
(ZOOFILIC)
-  } *A. STEPHENSI*
MYSORENSIS
-  } *A. STEPHENSI*
(URBAN)
-  } NON-MALARIOUS AREA
-  } UNSURVEYED AREA

NATIONAL MALARIA CONTROL PROGRAMME BOMBAY STATE 1953-54

INDO-AMERICAN FUND

BOMBAY STATE BUDGET

	T.C.A.			GOVT. OF INDIA
DDT 500 TONS	RS.	2,000,000	100 TONS RS. 400,000 (FROM UNICEF DONATION)
TRANSPORT				
60 TRUCKS	RS.	900,000	
15 JEEPS	RS.	180,000	
SPRAYERS				
450 HUDSON	RS.	45,000	
900 STIRRUP	RS.	58,500	
15 POWER	RS.	10,500	
TOTAL	<u>RS.</u>	<u>3,194,000</u>	<u>RS. 400,000</u>

1	A.D.P.H. (MALARIA).		
1	MALARIOLOGIST.		
1	JUNIOR ENTOMOLOGIST.		
2	ENT. ASSISTANTS.		
4	MEDICAL OFFICERS OF HEALTH.		
16	MEDICAL OFFICERS.		
23	ASST. MEDICAL OFFICERS.		
1	ENG. SUPERVISOR.		
59	MALARIA SUPERVISORS.		
63	MALARIA INSPECTORS.		
2	MALARIA ASSISTANTS.		
1	SUPERINTENDENT.		
1	ACCOUNTANT.		
3	ASSTT. ACCOUNTANTS.		
1	STENOGRAPHER.		
20	SENIOR CLERKS.		
36	JUNIOR CLERKS.		
91	DRIVERS.		
76	CLEANERS.		
48	INSECT COLLECTORS.		
108	PEONS.		
21	CHOWKIDARS.		
367	HAVILDARS.		
1835	SEPOYS.		
PLUS	CUSTOM'S DUTY.		
	MAINTENANCE OF TRUCKS.		
	FURNITURE.		
	OFFICE HIRE.		
	MISCELLANEOUS CONTINGENCIES.		
PLUS			
265	MUKADAMS	}	OF THE PUBLIC HEALTH DEPT. TO BE UTILISED DURING MALARIA SEA- SON—ITEM A.
795	MAZDOORS		
			TOTAL COST RS. 3,076,831
			PLUS RS. 378,900
			<u>(ON ITEM A)</u>

MALARIA ORGANIZATION, BOMBAY STATE — RESEARCHES CARRIED OUT 1942-1953

(APART FROM ROUTINE SURVEYS & INVESTIGATIONS)

EPIDEMIOLOGY	PROTOZOLOGY	ENTOMOLOGY	CONTROL	INSECTICIDES	CHEMOTHERAPY
1. ZONAL DISTRIBUTION OF MALARIA IN KANARA DIST. IN RELATION TO TOPOGRAPHY AND RAIN-FALL (1942-45)	1. A NEW SPECIES OF TRY-PANOSOME IN MOSQUITOES (1948)	1. BEHAVIOUR OF ANOPHELES FLUVI-ATILIS WITH SPECIAL REFERENCE TO NOCTURNAL ACTIVITIES (1942-45)	1. EXPERIMENTAL CONTROL OF A. FLUVIATILIS TRANSMITTED MALARIA BY PYRETHRUM SPRAY KILLING AND EVOLUTION OF A SPACED SPRAYING PROGRAMME (1943-45)	1. RELATION BETWEEN DDT DEPO-SITS ON WALL SURFACES AND DENSITIES OF MOS-QUITOES (1948-49)	1. FIELD STUDIES ON USE OF P.A.L.U.D.RINE (1946)
2. MALARIA INFECTIONS IN INFANTS (1943-44)	2. FIRST RECORD OF MALARIA. PLASMODIA IN A. TURKHADI (1948)	2. BREEDING HABITS OF FLUVIATILIS (1942-45)	2. AND BY CLEAN-WEED-ING, LARVICIDES (1943-45)	2. RATIO OF DETERIO-RATION OF DDT ON WALL SUR-FACES (1950-52)	
3. DEMOGRAPHIC TRENDS BEFORE AND AFTER IN-TRODUCTION OF CON-TROL MEASURES (1947)		3. NOCTURNAL BEHA-UIOUR OF A. CULI-CIFACIES (1952)	3. FIRST CIVILIAN LARGE-SCALE EXPERIMENT IN USE OF DDT FOR CON-TROL OF RURAL MALA-RIA (1945) FOLLOWED BY COMPREHENSIVE SCHEMES IN KANARA AND DHARWAR DIS-TRICTS (1946-50)	3. EFFECTS OF ALKALI ON DETERIORATION OF DDT AND USE OF SOAPS AS EMUL-SIFIERS (1949-50)	
4. CRITICAL REVIEW OF THE PHENOMENON OF IMMUNITY IN MALARIA AND A NEW CLASSIFICA-TION OF MALARIA ENDE-MICITY (1950)		4. VALIDITY OF HAND CAPTURES OF MOS-QUITOES FOR MEA-SURING DENSITIES (1950-51)	4. COMPARATIVE EFFICACY OF DDT AND BHC IN CONTROL OF RURAL MALARIA (1948-49)	4. A NEW EXPOSURE CELL FOR BIOASSAY OF INSECTICIDES (1950)	
		5. MORNING, AFTER-NOON, NIGHT DEN-SITIES OF MOSQUI-TOES IN HOUSES AND THEIR SIGNI-FICANCE IN AS-SESSMENT OF RE-SULTS OF MALARIA CONTROL (1949-50)			

LIFE CYCLE OF MALARIA PARASITE

(PLASMODIUM VIVAX)

MOSQUITO FEEDING
ON
INFECTED PERSON

INFECTED MOSQUITO
INTRODUCING
MALARIA PARASITES

