

National Health Problem Series—3

# FILARIASIS

IN

# INDIA



**CENTRAL HEALTH EDUCATION BUREAU**  
**Directorate General of Health Services**  
Ministry of Health, Government of India  
**NEW DELHI**

**FILARIASIS**  
**IN**  
**INDIA**

*by*  
**THE MALARIA INSTITUTE OF INDIA**  
**DELHI**

**CENTRAL HEALTH EDUCATION BUREAU**  
**Directorate General of Health Services**  
**Ministry of Health, Government of India**  
**NEW DELHI**

## CONTENTS

<i>Chapter</i>	<b>PAGE</b>
1. Introduction .. .. .	1
2. Filariasis Problem in India .. .. .	3
3. Filaria Parasite—Its Life-Cycle .. .. .	4
4. Natural History of Disease .. .. .	6
5. Vector Mosquitoes and their Life-Cycle .. .. .	7
6. Epidemiology .. .. .	8
7. Filariasis Survey .. .. .	10
8. W. malayi Filariasis .. .. .	12
9. Filariasis Control .. .. .	14
10. National Filaria Control Programme .. .. .	16
11. Social and Economic Effects of Filariasis .. .. .	21
Appendices .. .. .	24

# FILARIASIS IN INDIA

## INTRODUCTION

Filariasis, commonly known as elephantiasis, is known to be prevalent in India from very ancient times. This disease has been recorded in all the States of India except Jammu & Kashmir, Himachal Pradesh, Punjab and Rajasthan. Nearly 5 crore people live in filarious areas of the country.

The disease leads to the permanent swelling of the legs and of certain other parts of the body, besides causing recurring attacks of fever and inflammation of the lymphatic system. Though the disease does not cause death, it is responsible for a considerable amount of preventable suffering and disability.

Although many forms of animal life are known to have filarial infections of different types, man is known to be the victim of chiefly six types of filarial infections transmitted by various blood-sucking insects including mosquitoes. In India only two types of filarial infections are prevalent. They are, *Wuchereria bancrofti* and *Wuchereria malayi* and both of them are transmitted by mosquitoes. The possibility of inter-transmission of animal and human filariasis infection is under study.

The only effective measures against the disease known at present are those which are concerned with the control of carrier species of mosquitoes. The National Filaria Control Programme was launched in 1954 for controlling the carrier mosquito and administration of drugs on a mass scale in the filarious areas to reduce the reservoir of infection in human beings.

Scientific study of filariasis may be said to have commenced in 1863, when Demarquay in Paris first demonstrated the microfilariae, the embryos of the filarial worms, in the hydrocele fluid of a patient from Havana.

In 1866, Wucherer found microfilariae in the chylous urine of a Brazilian patient, and in 1872 Lewis in India recorded the microfilariae in the peripheral blood of a man. In 1876-77 the first lot of adult female worms (five in number) were secured from the lesions in the arm by Bancroft in Australia. Lichenstein reported that the microfilariae in a person from Achin, Sumatra was refractory to *C. fatigans* (the carrier of *W. bancrofti*) indicating the possibility of its being a new species. Following this, *Microfilaria malayi* was first reported by Brug in 1927. The adult worms of *W. malayi* were described by Rao and Maplestone in 1940 from specimens obtained from the former Travancore State.

The study of the transmission of filaria by Manson in Amoy (China) during 1878-79 led to one of the earliest discoveries incriminating an insect as a vector (carrier) of human disease. Two decades later, Ross unravelled the mystery of malaria transmission by mosquitoes.

At first, Manson thought that the fully developed infective larvae escaped into the water at the time the mosquitoes laid their eggs and then men contracted the infection by drinking such water. Low in 1899-1900 discovered that the larvae underwent further development in the mosquito and eventually passed on to man through the skin when the infected insect bites him.

In 1880, Manson also recorded the phenomenon known as "filarial periodicity" or the cyclic appearance and disappearance of the

microfilariae from superficial blood vessels of the infected persons. The microfilariae appeared during nights and disappeared during the day time. This necessitated the obtaining of blood samples for detecting filarial infection only at nights.

### Geographical Distribution

The disease is known to be prevalent in various parts of the world. *Wuchereria bancrofti* has an extensive distribution and occurs practically throughout the tropical countries. It has been found in the western hemisphere as far as Argentina in South America and in the eastern hemisphere from southern Spain to as far south as Queensland, Australia. It is especially prevalent in India and South China extending up to Japan, Indonesia and other Islands in the Pacific where, in some localities, the incidence of the disease is known to be very high. It is reported that filariasis in American Samoa probably causes greater damage than any other disease by its disabling effects and the undermining of the general health which may expose the patient to other infections. Filariasis is common in West and Central Africa and is also prevalent in parts of Arabia.

*Wuchereria malayi* has been reported from Malaya, East Indies, Sumatra, Borneo, New Guinea, India (especially Kerala State), Indo-China, Ceylon, Thailand, South China and Japan. *W. malayi* is often associated with elephantiasis of extremities only, while *W. bancrofti* affects the external genitals also.

APPENDIX I  
NATIONAL FILARIA CONTROL PROGRAMME  
DISTRIBUTION OF FILARIA CONTROL UNITS SANCTIONED

Serial No.	Name of the State	1955-56	1956-57	1957-58	1959-60	Total units allotted
1	2	3	4	5	6	7
1	Andhra Pradesh ..	2	—	—	—	2
2	Assam .. ..	—	—	1	—	1
3	Bihar .. ..	2	2	4	—	8
4	Bombay .. ..	3	1	4	—	8
5	Kerala .. ..	1-3/5	2	3	—	6-3/5
6	Madhya Pradesh ..	1	—	—	—	1
7	Madras .. ..	—	2	2	—	4
8	Mysore .. ..	2/5	—	—	3/5*	1
9	Orissa .. ..	1	4	—	—	5
10	Uttar Pradesh ..	1	2	5	—	8
11	West Bengal .. ..	1	—	—	—	1
12	Pondicherry .. ..	—	—	—	1	1
TOTAL ..		13	13	19	1-3/5	46-3/5**

\*Transferred from the second surplus unit of West Bengal.

\*\*The total number of units allotted is 47. The remaining 2/5 units is to be accounted for against the Islands Administration.

APPENDIX II

NATIONAL FILARIA- CONTROL PROGRAMME

*Statement showing the year-wise assistance given by the Centre to the States during the Second Five Year Plan*

(Rs. in lakhs)

Serial No.	Name of the State	1955-56	1956-57	1957-58	1958-59	1959-60
1	Andhra Pradesh ..	1.92	4.56	4.43	1.72	1.27
2	Assam .. ..	—	—	1.39	0.31	0.59
3	Bihar .. ..	4.43	9.01	16.87	4.99	11.39
4	Bombay .. ..	1.39	6.12	19.63	3.33	8.05
5	Kerala .. ..	1.85	5.56	12.81	4.84	12.73
6	Madras .. ..	1.92	2.97	8.74	2.33	3.14
7	Madhya Pradesh ..	1.86	3.00	1.83	0.05	0.62
8	Mysore .. ..	—	0.83	0.70	0.28	1.54
9	Orissa .. ..	2.18	7.18	13.64	4.12	3.56
10	Uttar Pradesh .. ..	2.02	4.68	18.20	3.46	9.39
11	West Bengal .. ..	2.01	0.84	3.24	—	0.37
12	Andaman & Nicobar Islands.	0.59	0.60	0.36	0.40	0.50
13	Laccadive and Minicoy Islands.	—	—	0.25	0.32	0.36
14	Pondicherry .. ..	—	—	—	—	—
15	Malaria Institute of India	—	0.07	—	—	1.41
TOTAL ..		19.17	45.42	102.14	26.15	54.92*

\*Approximately represents Central assistance made available to the States. The bills for the entire amount were, however, not submitted by the firms before 31st March, 1960.

**APPENDIX III**  
**NATIONAL FILARIA CONTROL PROGRAMME**

*New Pattern supplies (from 1958-59)*  
*(Government of India)*

Serial No.	Name of article	Quantity	Approximate rate (inclusive of customs duty, etc.)	
			Rs.	Rs.
<i>New Control Unit</i>				
1	Station Wagon .. .. .	1	15,000	15,000
2	Jeep .. .. .	1	13,000	13,000
3	Jeep Trailer .. .. .	1	1,500	1,500
4	Microscope .. .. .	1	2,000	2,000
5	Hand Compression Sprayers .. .. .	32	200	6,400
6	Stirrup Pumps .. .. .	25	100	2,500
7	Insecticides .. .. .	6 tons.	16,000	96,000
8	Mosquito Larvicidal Oil .. .. .	30,000 gallons.	2	60,000
9	Diethyl-carbamazine tablets 100 mgm. each .. .. .	1.6 million tablets.	—	79,600
TOTAL ..				2,76,000
<i>Continuing Unit (After first year)</i>				
1	Insecticide .. .. .	12 tons.	16,000	1,92,000
2	Larvicide .. .. .	30,000 gallons.	2	60,000
TOTAL ..				2,52,000
<i>States share of expenditure per unit</i>				
1	Salaries of staff .. .. .			77,000
2	Handling charges etc. .. .. .			4,000
TOTAL ..				81,000*

\*In case of Bihar State, the provision is Rs. 92,000.00 per unit as proposed by the State.



**APPENDIX IV**  
**NATIONAL FILARIA CONTROL PROGRAMME**  
*Statement showing work done up to 31-3-60*

State	Population covered with survey	No. of persons given drug	No. of houses sprayed				Total
			1st round	2nd round	3rd round	4th round	
1	2	3	4	5	6	7	8
Andhra Pradesh	10,94,488	2,30,658	2,36,886	61,049	45,066	—	3,43,001
Bihar	24,37,347	13,77,979	3,90,014	2,39,433	27,291	—	6,56,738
Bombay	12,33,640	3,02,990	3,36,689	1,43,388	36,550	—	5,16,627
Kerala	15,66,211	5,80,042	3,86,112	2,07,262	1,20,397	402	7,14,173
Mysore	2,09,562	81,883	29,831	7,852	—	—	47,683
Madhya Pradesh	25,66,540	1,98,826	3,651	—	—	—	3,651
Madras	29,63,285	5,59,836	71,481	—	—	—	71,481
Orissa	91,70,000	5,29,270	10,83,966	4,47,259	18,427	—	15,49,652
Uttar Pradesh	21,71,218	12,83,652	41,195	33,294	17,225	—	91,714
West Bengal	2,660	—	—	—	—	—	—
Assam	—	—	—	—	—	—	—
Andaman	6,790	867	7,636	1,925	48	—	9,609
	<b>2,34,21,741</b>	<b>51,46,003</b>	<b>25,87,461</b>	<b>11,51,462</b>	<b>2,65,004</b>	<b>402</b>	<b>40,04,329</b>

APPENDIX V

NATIONAL FILARIA CONTROL PROGRAMME

Statement showing the year-wise Central and State Expenditure

(Rs. in lakhs)

Year	Central Expenditure		State Expenditure
	T.C.M.	Govt. of India	
	1955-56	14.48	0.83
1956-57	32.38	15.48	9.43
1957-58	64.38	43.09	16.45
1958-59	0.18	29.16	29.14
1959-60	0.61	31.09	32.08
TOTAL	112.03	119.65	91.85

APPENDIX VI

NATIONAL FILARIA CONTROL PROGRAMME

Cost of a Continuing unit under the old Pattern up to 1957-58

Name of item of expenditure	T.C.M. Share		Government of India Share		State Share	
	Recurring	Non-Recurring	Recurring	Non-Recurring	Recurring	Non-Recurring
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1. 12 tons of Dieldrin	—	—	2,25,000	—	—	—
2. 11 tons of B.H.C. ..	—	—	18,700	—	—	—
3. Customs duty of Dieldrin.	—	—	—	—	—	—
4. Salaries of staff, etc.	—	—	—	—	77,000	—
5. Handling charges ..	—	—	—	—	4,000	—
TOTAL	—	—	2,43,700	—	81,000	—

---

---

PRINTED IN INDIA BY THE MANAGER, GOVERNMENT OF INDIA PRESS,  
FARIDABAD, 1960.

---

---