

INTER-REGIONAL CONFERENCE ON MALARIA FOR THE EASTERN MEDITERRANEAN AND EUROPEAN REGIONS



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ENGLISH ONLY

INFORMATION ON THE MALARIA CONTROL PROGRAMME IN PAKISTAN¹

1. Present status of malaria control in the country

1.1 Recently estimated population of the country (1951 census):

West Pakistan, including acceded States	32 026 229
East Pakistan	41 932 329
Total:	<u>73 958 558</u>

1.2 Number of inhabitants living in malarious regions:

West Pakistan, including acceded States	15 815 548
East Pakistan	24 300 000
Total:	<u>40 115 548</u>

1.3 Malaria morbidity and mortality statistics: malaria is not a notifiable disease in Pakistan. No reliable figures are available. The following are only morbidity and mortality figures from various hospitals and dispensaries, but which are considered an incomplete record of the actual cases:

	<u>Morbidity</u>	<u>Mortality</u>
West Pakistan, including acceded States	1 808 414	17 676
East Pakistan	9 920 900	99 209
Total:	<u>11 729 314</u>	<u>116 885</u>

1.4 Total population directly protected against malaria by any method of control in 1953:

West Pakistan	4 904 355
East Pakistan	2 311 442
Total:	<u>7 215 797</u>

¹ From the report submitted in February 1956 to WHO Regional Office for the Eastern Mediterranean.

1.5 Areas where the population is directly protected:

West Pakistan - from 1951

- Punjab (a) Residual : in selected villages in 14 districts out of the 16 districts of the province with extension of areas each year.
- (b) Antilarval & Residual mixed : antilarval in Lahore Corporation area and cantonments.
- N.W.F.P. (a) Residual : 1949-1953 - Kohat Hungu Valley
1952-1953 - extension in other districts.
- (b) Antilarval : Peshawar municipal area only.
- Sind (a) Residual : 1948-1953 - only in 4 districts out of 8, namely, in Larkana, Hyderabad, Tharparker and Thatta.
- (b) Antilarval : only in Sukkurtown municipal area.
- Baluchistan (a) Residual : 1949-1953 - (i) in rural areas of 3 districts of Quetta/Pishin and Sibi/Nasirabad;
(ii) coalfield areas of Match, Sharig and Quetta.
- (b) Antilarval : in the urban areas of 6 towns, namely, in Fort Sandeman, Harnai, Loralai, Sibi, Match and Nushki.
- Karachi (a) Residual : 1953 - Corporation, Cantonment, Port Trust and Railway areas.
- (b) Antilarval : Corporation, Cantonment, Port Trust and Railway areas.

East Pakistan

- (a) Residual : 1949-1951 - one district (Mymensingh)
1952-1953 - extension yearly in selected areas of other districts.
- (b) Mixed antilarval & Residual : Dacca urban area only, from 1949.

1.6 Data detailed in Annex I.

1.7 Information on the evaluation of the results of the campaign: the results of spleen and parasite surveys carried out in different areas show a marked decrease of the malaria level after the use of residual insecticides. Morbidity figures also show a considerable diminution. (For most of the following tables age and number of people examined were not indicated.)

West Pakistan

Punjab

In this province regular DDT spraying has been carried out from 1951 onwards. The following are examples of the changes observed since the introduction of DDT:

District	Sprayed or Unsprayed	Pre-operational June 1952		Post-operational January 1953		Morbidity °/oo 1952
		Spleen rate %	Parasite rate %	Spleen rate %	Parasite rate %	
Sheikhupura	Sprayed	32.2	21.0	21.5	14.3	1.6
	Unsprayed	28.0	21.3	27.5	26	26.8
Lyallpur	Sprayed	33.1	26.3	6.1	2.8	1.7
	Unsprayed	37.5	56.0	27.5	17.8	2.6
Jhang	Sprayed	34.8	46.4	4.8	2.8	1.2
	Unsprayed	30.2	40.2	63.9	4.1	43.8
Sialkot	Sprayed	42.9	43.5	20.7	30.7	4.4
	Unsprayed	49.7	38.6	46.4	42.8	26.5
Sargodha	Sprayed	48.1	19.4	8	6.0	2.6
	Unsprayed	27.7	13.3	26	11.0	6.0
Gujranwala	Sprayed	59.0	26.0	24.0	8.6	3.9
	Unsprayed	70.0	17.0	59.2	16.9	7.0
Dera Ghazi Khan	Sprayed	58.0	24.2	30.2	11.0	2.1
	Unsprayed	51.7	21.4	52.3	31.5	49.3
Gujrat	Sprayed	42.8	12.8	22.4	3.7	3.3
	Unsprayed	40.4	11.5	41.8	18.4	29.7
Montgomery	Sprayed	-	-	-	-	5.5
	Unsprayed	-	-	-	-	20.4
Mianwali	Sprayed	-	-	-	-	7.2
	Unsprayed	-	-	-	-	29.4

Sind

In this province, Larkana district, Hyderabad and Thatta have been sprayed from 1948, and Tharparkar from 1949 onwards. The districts of Dadu, Nawabshah, Sukkur and Jacobabad were not sprayed and a comparison is made of the spleen rates in both sprayed and unsprayed districts.

Spleen rates in children 2-10 years old

	1949	1950	1951	1952	1953
<u>Unsprayed districts</u>					
Jacobabad	68.8	66.8	69.0	72.0	35.5
Sukkur	57.5	65.8	64.0	66.0	65.8
Nawabshah	47.1	48.0	29.0	83.1	84.0
Dadu	48.6	48.0	82.0	83.0	81.7
<u>Sprayed districts</u>					
Larkana	61.4	30.7	30.5	27.1	28.1
Tharparkar	49.5	42.0	45.2	35.0	35.8
Hyderabad	42.6	29.5	31.2	24.1	22.5
Thatta	41.2	25.8	28.3	18.0	18.5

North West Frontier Province

The following are results of spleen and parasite surveys in the Kohat-Hungu Valley, sprayed from 1949 onwards.

Villages	1949		1950	1951	1952	1953
	Before spray	After spray				
Nasrat Khel						
Spleen rates	55.8	27.2	20.0	12.0	10.0	
Parasite rates	10.0	6.4	-	-	-	
Chakar Kot						
Spleen rates	72.3	58.6	23.0	7.0	5.0	0.0
Parasite rates						
Sherkot						
Spleen rates	43.2	26.8	23.0	17.0	11.0	0.0
Parasite rates	8.8	6.6	-	-	-	-
Khadi Zai						
Spleen rates	57.2	30.1	19.0	13.0	8.0	
Parasite rates			-	-	-	-
Hangu						
Spleen rates	47.0	30.0	30.0	8.0	8.0	0.5
Parasite rates			-	-	-	-
Jungal Khel						
Spleen rates	31.8	16.6	16.0	8.0	6.0	
Parasite rates						
Ibrahim Zai						
Spleen rates	54.0	27.4	27.0	4.0	4.0	
Parasite rates	23.0	0.0				
Ustarzai Payu						
Spleen rates	44.7	22.2	20	12.0	8.0	0.6
Parasite rates	3.9	0.7				

Baluchistan

Spleen and Parasite Rates

	Before Control 1946		After Control 1953	
	S.R.%	P.R.%	S.R.%	P.R.%
<u>Rural areas</u>				
Quetta/Pishin	57	48	9	6
Sidi/Nasirabad	64	85	18	13
<u>Urban areas</u>				
Fort Sandeman	52	49	15	10
Harnai	60	56	16	11
Sibi	61	53	15	10
Loralai	62	52	19	14
Match	53	46	17	12
Nushki	56	45	18	14
<u>Coalfields</u>				
Quetta/Sharig Range	58	49	19	14
Sharig Range	62	53	18	13
Match Range	64	53	19	14

East Pakistan (Bengal)

Residual insecticides have been used since 1949. The following figures exemplify the reduction observed in the spleen and parasite rates since the introduction of residual insecticides:

	1949		1950		1951		1952		1953	
	Pre-spray	Post-spray	Pre-spray	Post-spray	Pre-spray	Post-spray	Pre-spray	Post-spray	Pre-spray	Post-spray
<u>Dist. Mymensingh</u>										
Gouripur										
Nandail										
Spleen rate	69.5	41.0	12.7	7.8	6.6	4.9	4.8	2.5	1.4	1.3
Parasite rate	25.0	6.2	2.0	4.4	1.3	0.0	0.0	0.0	0.0	0.0
<u>Controls (unsprayed)</u>										
Spleen rate	79.0	81.0	68.0	66.9	78.0	55.8	64.0	60	61.6	71.0
Parasite rate	25.0	16.3	22.7	14.6	12.7	14.0	22.7	21.2	23.8	12.9

1.8 Information available, if any, on general improvements that may have followed malaria control in the social and economic fields: this cannot be evaluated in most of the provinces. However, some effort was made in this direction in East Pakistan and Baluchistan. In the first it was found that there was an increase of jute and rice cultivation ranging from 15 to 40 per cent. in the DDT sprayed areas. In Baluchistan it was noticed that there was an all-round increase in the production of crops and the output of coal.

2. Organization, methods and training facilities of the present programme

2.1 Organization

The central government maintains a Malaria Institute with headquarters at Dacca and a branch at Karachi. Training is provided at Dacca for medical graduates who are going to work as antimalaria officers; the courses last for eight weeks. There are also facilities for training of qualified sanitary inspectors, the course lasting six weeks. The Institute directs malarimetric surveys and evaluates the results of these operations. The testing of insecticides and antimalaria drugs is also done at the Institute. The branch at Karachi is equipped and staffed for the training of sanitary inspectors for malaria work and also takes part in the surveys and evaluation of results.

The provincial governments have one or two antimalaria officers and also, in some cases, an entomologist, who direct the control operations and supervise the collection of malarimetric and entomological information. They are assisted by malaria inspectors and laboratory technicians.

2.2 Methods of malaria control

2.2.1 Residual spraying is the method of choice in all rural areas. Antilarval methods are only used in a certain number of large towns.

2.2.2 Antimalaria drugs are not used for malaria control in any part of the country. There is, however, a certain amount of distribution during the malaria season, especially in areas where spraying is not done; proguanil is commonly employed.

2.3 Training facilities

Facilities are available for the training of antimalaria personnel at all levels at the Malaria Institute at Dacca, but training of medical officers can also be provided if necessary at the Institute of Hygiene and Public Health at Lahore. Inspectors can be trained both at Dacca and at the Karachi branch of the Malaria Institute. In emergencies, inspectors can also be trained at the Institute of Hygiene and Public Health, Lahore, and the Provincial Malaria Research Laboratory at Dacca. The training of personnel below the level of malaria officers and inspectors is done at the headquarters of each province under the direction of the provincial malaria officers.

3. Plans for the future

The aim of the campaign now in progress is to reduce malaria to such an extent that it is no longer a public health hazard. A five-year extensive country-wide antimalaria programme is under consideration by the Government.

ANNEX I

Year: 1953

1. Area of operations (sq. miles):	West Pakistan	50 153
	East Pakistan	2 022
	Total:	<u>52 175</u>
2. Number of houses and all other structures sprayed:	West Pakistan	529 930
	East Pakistan	<u>1 748 482</u>
	Total:	<u>2 278 412</u>
3. Population directly protected (i.e. living in sprayed structures):	West Pakistan	4 055 005
	East Pakistan	<u>1 711 442</u>
	Total:	<u>5 766 447</u>
4. Population protected by other methods of control (antilarval measures):	West Pakistan	849 350
	East Pakistan	<u>600 000</u>
	Total:	<u>1 449 350</u>
5. Number of sprayings in the year:		
	West Pakistan - Punjab	1
	Baluchistan	2
	Sind	2
	N.W.F.P.	1
	East Pakistan	1
6. Insecticides and formulations used: total annual consumption (lbs):		
	DDT (50-75 per cent. wettable powder)	746 743
	BHC	4 625
7. Average dose of insecticide per square foot for each spraying:		
	West Pakistan - Punjab	200 mg
	Baluchistan	128 mg
	Sind	50 mg
	N.W.F.P.	278 mg
	East Pakistan	150/100 mg
8. Types of sprayers used:		
	West Pakistan - Punjab	- Stirrup pumps only
	Baluchistan	- Knapsacks compression & stirrup pumps
	Sind	- Stirrup pumps only
	N.W.F.P.	- Stirrup pumps & knapsacks compression sprayers
	East Pakistan	- Dobbins, Hudson & Smith type of compression sprayers

Annex I

9. Are all structures sprayed? Yes.
10. Average superficial area sprayed during each spraying per inhabitant directly protected: not given.

11. Cost of residual spraying operations (in rupees)

11.1 Total cost per year:

West Pakistan	Rs. 1 439 503	(US \$302 299)
East Pakistan	850 000	(178 496)
Total:	Rs. 2 289 503	(US \$480 795)

11.2 Percentage of the total sum expended on insecticides formulations: not given.

11.3 Annual cost per capita of the population protected by the above methods:

West Pakistan	Rs. 0.5.8	(US \$0.07)
East Pakistan	0.8.0	(US \$0.11)

12. Cost of operations by other methods of anopheles control

12.1 Total cost of operations per year (in rupees):

West Pakistan

Punjab (Lahore), combined antilarval and residual	Rs. 383 675	(US \$80 570)
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Baluchistan

Six urban areas, antilarval methods	Rs. 4 376	(US \$ 919)
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East Pakistan

Dacca urban area antilarval methods	Rs. 352 992	(US \$74 127)
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Annex I

12.2 Annual cost per capita of the population protected by the above methods:

West Pakistan		
Punjab	Rs. 0.8.0	(US \$0.11)
Baluchistan	0.0.10	(US \$0.01)
East Pakistan		
	0.12.0	(US \$0.16)

13. Cost of control operations by drug prophylaxis, if any

Not used for control operations.

Data available for 1954 and 1955

3. Population directly protected (i.e. living in sprayed structures):

	<u>1954</u>	<u>1955</u>
West Pakistan	7 597 613	4 897 118
East Pakistan	<u>3 131 428</u>	<u>3 378 318</u>
Total:	10 729 041	8 275 436

4. Population protected by other methods of control: not given.

5. Number of sprayings in the year:	West Pakistan	1
	East Pakistan	2

11. Cost of residual spraying operations

11.1 Total cost per year:

	<u>1954</u>	
West Pakistan	Rs. 1 238 833	(US \$260 150)
East Pakistan	Rs. <u>534 900</u>	(US \$112 327)
Total	Rs. 1 773 733	(US \$372 477)

	<u>1955</u>	
West Pakistan	Rs. (not yet known)	
East Pakistan	Rs. 469 970	(US \$ 98 609)

(Note: in the document from which the data of this page have been drawn, the cost of residual spraying operations for 1953 is given as follows:

West Pakistan	Rs. 1 124 190	(US \$236 075)
East Pakistan	Rs. <u>530 900</u>	(US \$111 486)
Total	Rs. 1 655 090	(US \$347 562)