



SECOND REGIONAL CONFERENCE ON MALARIA ERADICATION

ADDIS ABABA, 16 - 21 NOVEMBER 1959

EM/ME-Tech.2/27

28 October 1959
ENGLISH ONLY

SURVEILLANCE PROGRAMME IN IRAN

by

A. Tabibzadeh, M.D., M.P.H.
Director General of Malaria Eradication, Iran

INTRODUCTION

With more and more countries starting malaria eradication campaigns, experience is being gained in the development of surveillance, a technique essential to the final stages of an eradication campaign when transmission has been interrupted for a number of years and it is desired to search out and treat the remaining cases.

Using the terminology adopted by WHO, this surveillance is started during the attack phase, reaching its full development during the consolidation phase.

History of Surveillance in Iran

The concept of surveillance is not new in Iran although the term may be.

A spraying programme had been carried out for a number of years in the Veramin area in Iran (this is near Teheran) and after several years, extensive surveys revealed the virtual absence of vector mosquitoes. In addition it was found that the spleen index had been reduced and no parasitologically confirmed case was found.

This area had once been highly malarious, spleen indices as high as 80% having been found. The authorities felt that by placing the people and the anopheline populations under periodic observation it might be possible to discontinue spraying in this area.

Initially one-third of the villages, spatially distributed to assure sampling over the whole area, would serve to meet the criteria for determining the possibility of spraying discontinuation.

During 1956, 200 villages were so studied. During the second year two-thirds of the villages would go under this programme, culminating in the third year when all would be regularly visited.

No positive cases were found during the first year. During the second year when two-thirds of the villages came under the programme a small focus with evidence of continuing transmission was located. This area was found on the common boundary separating two malaria control organizations, the Near East Foundation and the Ministry of Health.

Since this focus was not found during the sampling of one-third of the villages, it became apparent that all of the villages would have to be included before data could be assembled to determine if spraying discontinuation was possible or not.

Experience gained in this area permitted planning for a country wide programme in anticipation of eradication. The method used was prepared for submission to the Medical Congress meeting in Athens in 1957 by the Institute of Malariaology. The Congress did not approve of the entomological aspects of the programme and these were abandoned.

During the years 1957 and 1958 surveillance operations were carried out solely by monthly visits, village by village, seeking all febrile cases and suspected cases. Southern Iran has a long transmission season and surveillance operations were planned for the entire period; as one goes north the shorter transmission seasons resulted in six to eight months periods in which active surveillance was carried out, climatic conditions and altitude making inaccessible much of this area during a part of the year. A chart showing the transmission seasons in various Ostans is attached (Annex I).

ORGANIZATION

Surveillance agents make house to house visits. Blood slides are clearly marked with a serial number, the house number, and the village number to avoid error in the Laboratory. Normally in regions where villages are close to each other, easily accessible, and each has an average population of 200 to 400 people, thirty to forty villages are placed in the care of one surveillance agent. In the mountainous regions which are hard to reach and where villages are scattered, fifteen to thirty villages are placed under the charge of one agent. Each group of three surveillance agents has a supervisor, who himself also performs the tasks of a surveillance agent. They have a vehicle at their disposal. The supervisor is responsible for putting each agent in charge of a group of villages, supervising daily activities, sending blood

smears promptly to the nearest regional and branch laboratory, and informing the township (Shahrestan) surveillance agent concerned of the result. An organization chart is attached herewith. (Annex 2) Annex 3 shows the number of surveillance agents, laboratory staff, epidemiologists, etc.

Surveillance agents received their training during the preparatory stage from the Institute of Malariaology which had sent mobile teams to various regions. However, after the establishment of Medical Services in Ostan provinces in 1958-59, training has been given by the Medical Services staff with the help of the Institute of Malariaology.

The training period for a surveillance agent ranged from twenty to thirty days and their monthly salaries varied between 3,500 and 5,500 rials (\$45.15 - \$71.89). A copy of the training programme for provinces, as prepared by the Institute of Malariaology, is attached herewith. (Annex N° 4).

SURVEILLANCE AGENTS' QUALIFICATIONS

Agents should have passed the ninth grade of education. They are as far as possible chosen from among the local inhabitants so that they may be conversant with local dialect and be adapted to local climate and food. The age limit is from eighteen to thirty-five, so that they may be able to walk long distances during hot weather. Each agent carries a sack containing a box to accommodate twenty blood smears, anti-malaria medicines, Chloroquine, Daraprim and other non-malaria medicines such as Aspirin, Sulphaguanidine etc. He also carries a register containing the names of the villages under his charge, thus enabling him to discharge his duties successfully.

SURVEILLANCE METHODS

1 - The method followed in Iran is according to the proposal made by the Epidemiology Division of the Malariaology Institute, and approved by the Scientific Council. It provides that blood smears be taken from all febrile cases as well as individuals who have had fever during the month. The same applies to visitors or emigrants in and around villages. Blood smears should be collected from them in the following month even if they do not have fever. Positive cases are to be kept under observation throughout the year and blood smears collected from them.

2 - The method followed in other countries consists of :

- a- The method followed in Iran.
- b- Volunteers working without receiving salary.
- c- The surveillance practised by clinic doctors, private practitioners, hospitals, laboratories, nurses, midwives, pharmacists, etc.

The surveillance operations carried out last year by the Malaria Eradication agents once-a-month and by the Research Centre of the Malariology Institute two to three times a month, are as follows:

1- Surveillance agents of Malaria Eradication inspected some thirty villages per month.

2- The Institute agents kept under surveillance five to ten villages each, collecting blood smears, supervising entomological activities, such as determining the density of adults and larvae.

A comparison between the two groups, one inspecting thirty villages a month and the other ten, is made (Annex 5).

As can be seen, the average ratio of blood smears collection and the amount of work varies. The more the collection of blood smears, the more accurate the discovery of positive cases. Also the closer the inspections, the easier the discovery of cases with malarial parasites.

In support of this contention, a village called Dadin was chosen in the Kazeroon District. First, the Malaria Eradication Surveillance agent collected thirteen blood smears. Next day the Institute agents collected forty eight blood smears. The ratio of positive cases was 13% in the former instance and 35% in the latter. This proves that, the more time the agents have to inspect a village, the more positive cases they would discover.

Annexes 6 and 7 show comparisons of spraying operations and surveillance during the first three months of the years 1958 and 1959. Annex 9 shows the comparison of surveillance activities in different years.

Maps numbers 1, 2, 3, 4 show the zoning of malaria eradication and plan of spraying in 1957-58 and 1959.

TREATMENT METHOD

According to the recommendations made by the World Health Organization, positive cases of P.vivax and P.malariae were to be treated by the radical method of administering a full course of Chloroquine followed, after one week, by a fourteen days treatment with primaquine (15 mgm.). The lack of personnel and the fact that this treatment entailed complications, were the reasons why it was administered to a very limited group.

The second method which cannot be viewed as the basic treatment of positive cases, but rather a prophylactic measure, consists of administering one course of Chloroquine and for the following six months 100 mgms. (four tablets) of Daraprim per month. The conclusions

were as follows:

1- The relapse ratio under the method of treatment combining Chloroquine and Primaquine was 2%. If the acute complications of the disease could somehow be prevented and drugs put at the disposal of surveillance agents or literate persons residing in the village, enabling them to give daily treatment to positive cases for fourteen days, the positive cases would register a significant drop.

2- The ratio of relapses under the method combining Chloroquine and Daraprim in sprayed villages was the same for 2-9 years old children and the adults.

3- The ratio of relapse with the Chloroquine-Daraprim method in the first six months of the treatment is 10% and in the second six months 2 $\frac{1}{2}$ %.

The implementation of this method was not possible in the Southern tribal regions where the tribes change place daily and cannot be approached easily.

In order to evaluate its effectiveness, this method of treatment was studied in the Kazeroon research centres, in areas passing through the phases of consolidation and maintenance and in limited areas of epidemic foci.

The results obtained from this method of treatment in Kazeroon villages are as follows :

1- Results of Chloroquine and Primaquine treatment of Vivax cases according to the WHO's recommended method during 1958.

Total of persons under treatment	63
Number of 2 to 9 years old	49
Number over 9 years old	14

Only one case of relapse (2%) was noticed after three months in the 2 to 9 years age group.

2- Results of Chloroquine and Daraprim treatment of Vivax cases according to WHO's recommendations:

Total number of positive cases	106
Positive cases 2 to 9 years old	83
Over 9 years old	23

Number of relapses among children 2 to 9 years old after

<u>1-2-3-4-5-6-7-8-9-10-11-12-13-14</u> months	
4-1-1-3	1 1 relapses

Number of relapses among persons over 9 years of age after

1-2-3-4-5-6-7-8-9-10-11-12 months
2-1 relapses

Relapse ratio in children 2 to 9 years old $13 \frac{1}{2}\%$
" " " adults 14%

Relapse ratio during the first six months of treatment was 10% and in the second six months of year $2 \frac{1}{2}\%$.

RESULT OF TREATMENT OF FALCIPARUM CASES WITH CHLOROQUINE ALONE

Total number of positive cases 23

Number of positive cases up to 2 years old 4
" " " " 2 to 9 years old 11
" " " " over 9 years old 8

No relapse has been noticed.

RESULTS OF TREATMENT OF VIVAX CASES WITH CHLOROQUINE ALONE

Total number of positive cases 16

Number of positive cases 2 to 9 years old 10
" " " " over 9 years old 2

Number of relapses in 2 to 9 years age group after

1-2-3-4-5-6-7-8-9-10-11-12-13 months
2

No relapse was noticed among the adult people.

Relapse ratio for all cases $12 \frac{1}{2}\%$, for 2 to 9 years old 20%.

Relapse ratio during first month 20%.

The following conclusions are reached:

1- Treatment of Vivax cases with Chloroquine alone appears to have limited usefulness.

2- Treatment with chloroquine and Primaquin, if medically supervised seems to be the most effective method.

3- In countries like Iran where health programmes have not yet advanced sufficiently, the method of combining Chloroquine and Pyrimethamine, is recommended.

4- Treatment of falciparum cases by Chloroquine alone seems to be fully effective.

The actual cost of surveillance operation in Iran as presently carried out is itemised in Annex 8.

Briefly the basic expenses relating to one protected person in form of active surveillance per year are 19.2 Rls.

Supervision expenses and administrative overhead charges per year are 9.6 Rls.

Total cost of protecting one person per year through surveillance:

$19.2 + 9.6 = 28.80$ Rls. This is the real cost of protecting one person per year, which is equivalent to 38 cents.

CONCLUSIONS

Under Iranian conditions the point at which spraying should be stopped varies with the intensity of the disease and its stability. The end-point need never be zero, but a reduction in amount, so that prompt detection and radical treatment is effective in not resuming transmission.

It is felt that surveillance, properly organized, can be of material assistance in areas where malaria is more or less stable in speeding up the end-point of complete transmission and serves to reinforce the imagocidal campaign. To be fully effective, this should be organized during the attack phase. This is especially useful if such areas are limited in size, surrounded by territory of slight endemicity.

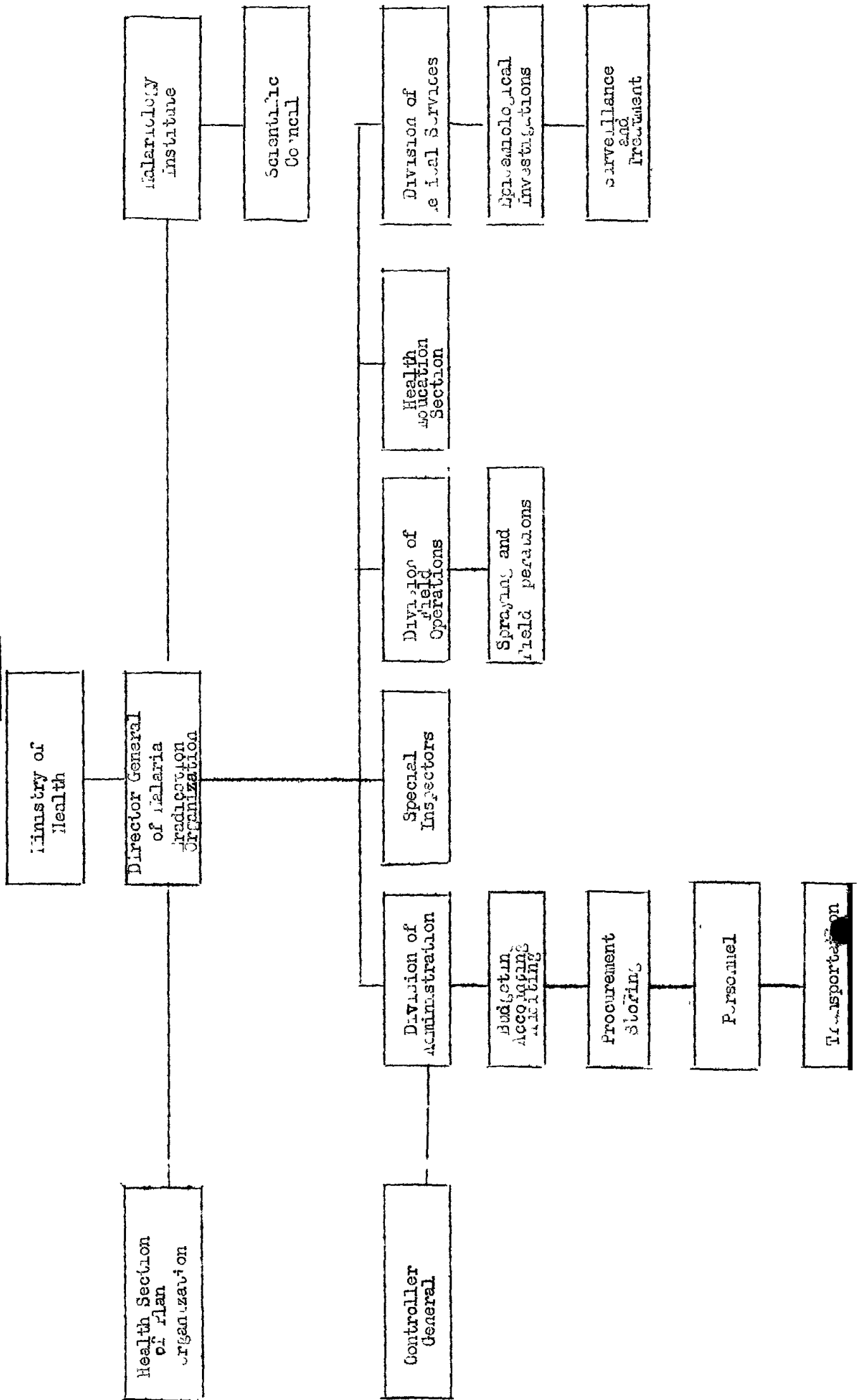
In retrospect, the down-grading of the entomological aspects of the programme appears to have been a mistake, since entomological observations help to reveal areas in which declining anopheline populations might reveal methods by which a little additional pressure or modifications of the programme might speed up the final cessation of transmission. In addition, increasing anopheline populations despite insecticidal pressure might indicate areas where resistance is building up. In Iran the country is so large that research stations cannot hope to sample all of it and suitable entomological observations might indicate happenings which should receive additional study to prevent holes developing in the program.

We do not think we have found the final answer in regard to surveillance, much additional work and variation in methods might have to be investigated and field trials made. If a significant number of symptomless carriers, undetected by the surveillance mechanism, escape detection in the usual search for febrile cases it might be necessary to routinely sample children between the ages of two to nine years of age to detect the number of these symptomless carriers and assess the effect they might have on the eventual success of the programme.

REFERENCES

- 1- Report of Surveillance Activities from Malaria Eradication Organization.
- 2- Report of Research Station on Surveillance and Minute of Meeting of Scientific Council.
- 3- Surveillance in Iran. Paper presented by Dr. Mofidi to Inter Regional Conference of Malaria in Athens.
- 4- Surveillance in Iran. Paper presented by Dr. A.Tabibzadeh to Regional Conference of Malaria in Baghdad.

ANNEX 2



Provinces	Chief medical Servives Epidemiologist	Chief field Operations	Tech-nical Director and surveillance	Chief laboratory	Microscopist	Collector	Chief Province Malaria Control	Dis-trict Leader	Crew leader and Surveillance Agent	Stati-cian	Admi-nistrative Staff	Fiscal Office	Trans-portion	Driv-ers Employees	Total	Remarks
TTeheran area	2	1	2	1	14	2	7	24	138	13	4	15	3	56	12	294
Resht I Gilan	1	1	2	1	15	2	7	18	75	13	4	14	4	39	16	212
Babol II Mazan-deran	1	1	2	1	9	-	5	16	67	9	4	12	4	34	10	175
Azarba-i-jan III & IV	4	1	3	1	20	2	9	36	157	16	4	15	5	70	14	357
Kerman-shah V	2	1	2	1	3	1	6	12	72	11	3	13	3	48	11	189
Ahwaz VI Khuzes-tan	3	-	2	-	7	1	6	13	43	11	4	14	2	45	11	162
Shiraz VII Fars	3	1	2	1	5	2	6	14	68	12	3	13	4	53	11	198
Kerman VIII	1	1	1	1	5	2	5	18	66	11	3	13	4	43	10	184
Mesqhed IX Kohra-san	2	-	2	1	12	2	5	15	63	10	4	11	4	44	10	185
Isfahan X	1	-	2	-	6	2	5	17	69	11	3	14	3	34	11	178
Headquar-ters	4	3	-	-	-	-	-	-	-	18	27	42	40	23	39	196
Total	24	10	20	8	96	16	61	183	818	135	63	176	76	489	155	2330

INSTITUTE OF PARASITOLOGY

& MALARIOLOGY

TEHERAN

ANNEX 4

Training programme for

M.E.O. Bakhsh Leaders (Surveillance Supervisors)

18th Bahman - 30th Bahman 1337

7th February - 19th February 1959

1st week	18.11.37 Saturday 7. 2.59	19.11.37 Sunday 8. 2.59	20.11.37 Monday 9. 2.59	21.11.37 Tuesday 10. 2.59	22.11.37 Wednesday 11. 2.59	23.11.37 Thursday 12. 2.59
8 1/2	<u>Protozoology</u> Introduction Importance of Malaria Life cycle of Malaria Parasites	<u>Protozoology</u> Human Plasmodia	<u>Epidemiology</u> <u>Epidemiology</u> & Distribution of Malaria in Iran	<u>Entomology</u> Identification of the adult culicidac & Anopheline	<u>Malaria Control</u> <u>Insecticides</u> Chemistry, Formulation, Actions & Toxicity	Surveillance
9 1/2	<u>Entomology</u> Introductory systematic & Biology of Culicidae	Introductory systematic	Treatment & Prevention of Malaria			Environmental Sanitation
10 1/2	<u>Practical</u> Protozoology preparation of Blood Smears labelling Recording & Shipping Methods of Staining	<u>Practical</u> Protozoology staining & Examination of Blood Parasites	<u>Entomology</u> Morphology of Culicidae Demonstration of Larva & Nymphs of Anopheles & Culex	<u>Practical</u> Entomological Materials Methods of collection & Density Estima- tion Recording & Shipping	<u>Practical</u> Malaria Control Different kinds of sprayers Use and Care	Visit to the Malaria Institute
11 1/2						

2 nd week	25.11.37 Saturday 14. 2.59	26.11.37 Sunday 15. 2.59	27.11.37 Monday 16.2.59	28.11.37 Tuesday 17. 2.59	29.11.37 Wednesday 18. 2.59	30.11.37 Thursday 19. 2.59
8 1/2	<u>Malaria Control</u> Organization of M. E. O.	F I E L D W O R K	Field work Practice of spraying	Field work Practice of Surveillance and Collection of Mosquitos (adults & larvae)	Field work Practice of Surveillance and Collection of Mosquitos (adults & larvae)	F I N A L E X A M I N A T I O N
9 1/2	<u>Administration</u> Administrative rules & procedures Individual duties Recording Reporting & Inspection					
10 1/2						
11 1/2	Visit to M. E. O.					

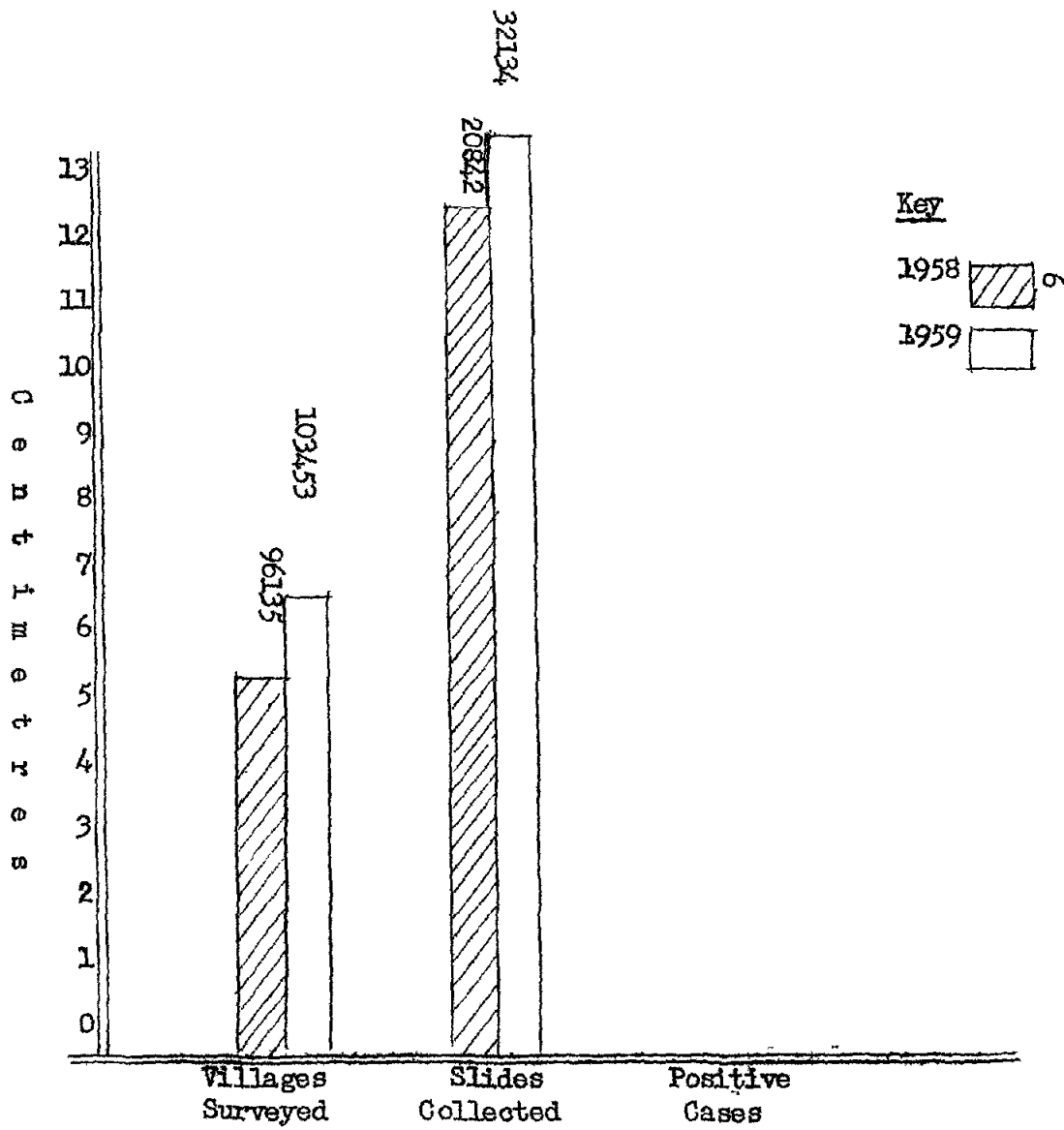
1st week	Saturday 18.11.37 7. 2.59	Sunday 19.11.37 8. 2.59	Monday 20.11.37 9. 2.59	Tuesday 21.11.37 10. 2.59	Wednesday 22.11.37 11. 2.59	Thursday 23.11.37 12. 2.59
8 1/2	<u>Protozoology</u> Introduction Importance of Malaria Life cycle of Malaria Parasites	<u>Protozoology</u> Human Plasmodia	<u>Epidemiology</u> <u>Epidemiology</u> & Distribution of Malaria in Iran	<u>Entomology</u> Identification of the adult culicinae & Anophelinae	<u>Malaria Control</u> <u>Insecticides</u> Chemistry, Formulation, Actions & Toxicity	Surveillance
9 1/2	<u>Entomology</u> Introductory systematic & Biology of Juliidae	Introductory systematic	Treatment & Prevention of Malaria			Environmental Sanitation
10 1/2	<u>Practical</u> Protozoology preparation of Blood Smears Labelling Recording & Shipping Methods of Staining	<u>Practical</u> Protozoology staining & Examination of Blood Parasites	<u>Entomology</u> Morphology of culicidae Demonstration of Larva & Nymphs of Anopheles & Culex	<u>Practical</u> Entomological Materials Methods of collection & Density Estima- tion Recording & Shipping	<u>Practical</u> Malaria Control Different kinds of sprayers Use and Care	Visit to the Malaria Institute
11 1/2						

2 nd week	25.11.37 Saturday 14. 2.59	26.11.37 Sunday 15. 2.59	27.11.37 Monday 16.2.59	28.11.37 Tuesday 17. 2.59	29.11.37 Wednesday 18. 2.59	30.11.37 Thursday 19. 2.59
8 1/2	<u>Malaria Control</u> Organization of M. E. O.	F I E L D W O R K				
9 1/2	<u>Administration</u> Administrative rules & procedures Individual duties Recording Reporting & Inspection	F I N A L E X A M I N A T I O N				
10 1/2		Field work Practice of spraying				
11 1/2	Visit to M. E. O.	Field work Practice of Surveillance and Collection of Mosquitos (adults & larvae)				

Comparison table of surveillance by the Institute of Malariaology with the Surveillance Activities of the MEC executive during 1958.

Month	K A Z A R U N With Drug										K A Z A R U N without Drug									
	I. E. J. Surveillance					Inst. Malariaology Surv.					I. J. O. Surv.					Inst. Malariaology Surv.				
	Vill.	Slides	Posit.	Slides per Vill.	Pos. per 100 Slides	Vill.	Slides	Posit.	Slides per Vill.	Pos. per 100 Sl.	Vill.	Slides	Pos.	Slid. per Vill.	Pos. per 100 Sl.	Vill.	Slid.	Pos.	Slid. per Vill.	Pos. per 100 Sl.
Apr	388	2355	2	6.0	.08	7	210	4	300	1.90	388	2355	2	6.0	.08	13	405	8	31.1	1.97
May	380	3631	43	9.5	1.18	10	385	10	38.5	2.59	380	3631	43	9.5	1.18	17	593	15	34.8	2.52
June	295	2813	66	9.5	2.34	10	355	19	35.5	5.35	295	2813	66	9.5	2.34	17	569	52	33.4	9.13
July	399	3876	101	9.7	2.60	10	437	20	43.7	4.57	399	3876	101	9.7	2.60	17	671	34	39.4	5.06
Aug.	256	2044	25	7.9	4.64	10	475	39	47.5	8.21	256	2044	25	7.9	4.64	17	709	53	41.7	7.47
Sept.	300	3026	73	10.0	2.61	10	572	39	57.2	6.81	300	3026	73	10.0	2.61	17	826	55	48.5	6.65
Oct.	212	1301	51	6.5	3.7	9	585	22	65.0	3.76	212	1381	51	6.5	3.7	17	872	68	51.2	7.79
Nov.	440	4285	120	9.7	4.43	10	676	17	67.6	2.51	440	4285	120	9.7	4.43	17	959	33	56.4	3.04
Dec.	383	3636	55	9.4	1.51	17	847	17	49.8	2.0	383	3636	55	9.4	1.51	16	849	46	53.0	5.41
Jan.	425	3894	37	9.1	.95	18	1042	1	57.8	.09	425	3894	37	9.1	.95	18	1244	15	69.1	1.20
Feb.	-	-	-	-	-	18	857	0	47.6	-	-	-	-	-	-	19	998	7	52.5	.70
Mar.	-	-	-	-	-	16	705	3	44	.04	-	-	-	-	-	19	909	5	47.8	.55

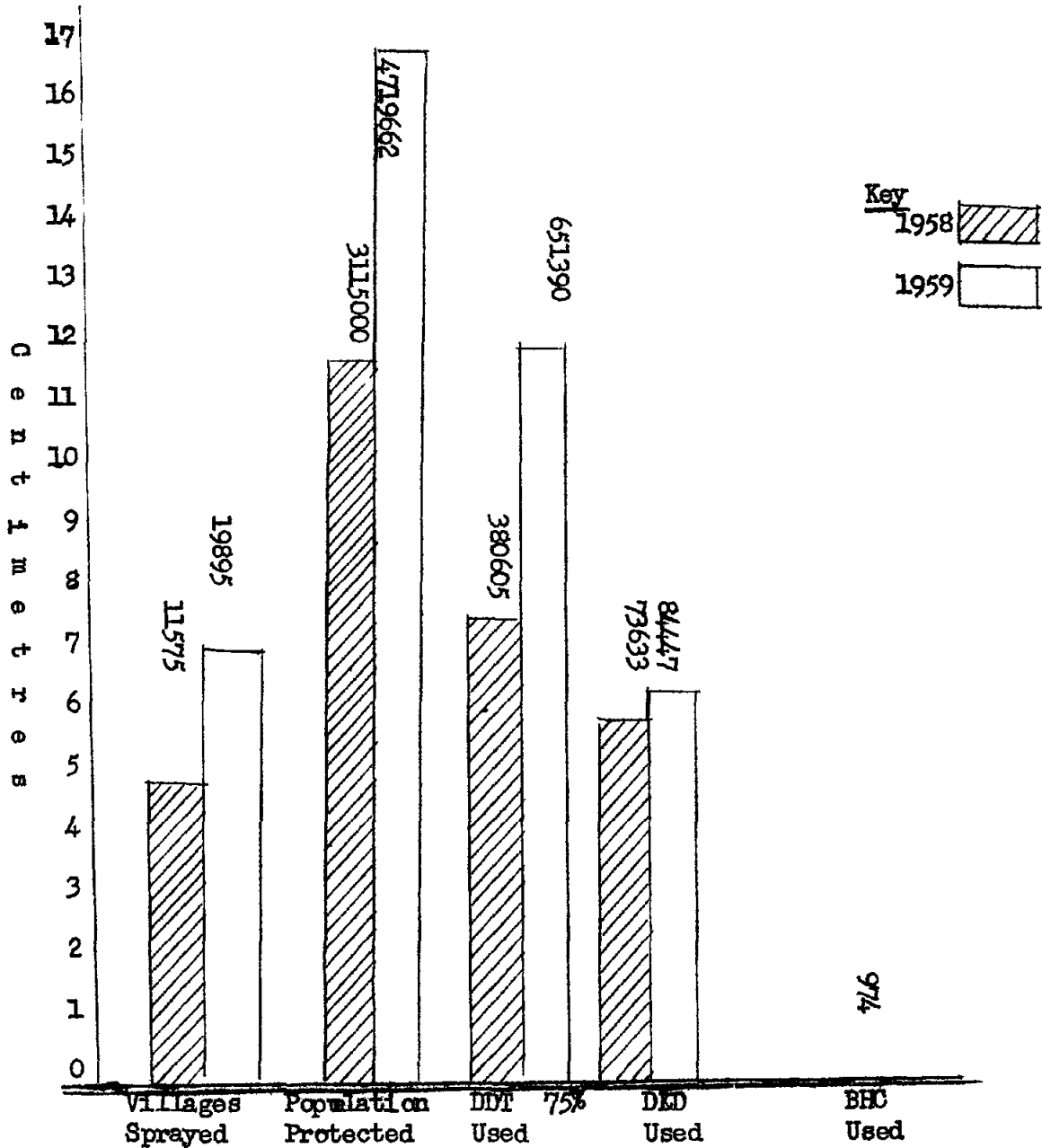
COMPARISON OF SURVEILLANCE ACTIVITIES DURING FIRST
THREE MONTHS OF YEAR
(1958-1959)



Each Centimetre shows 6,000 Villages under Surveillance
 " " " 9,000 Slides Collected.
 " " " 6,000 Positive Cases.

ANNEX 7.

COMPARISON OF SPRAYING OPERATIONS DURING FIRST
THREE MONTHS OF YEAR
(1958-1959)



Each Centimetre shows 3000 Villages Sprayed.

- * " " 300,000 Persons protected.
- " " " 60,000 Kg. DDT 75% Used.
- " " " 15,000 Kg. DDD Used.
- " " " 3,000 Kg. BHC Used.

ANNEX 8ANNUAL COST OF SURVEILLANCE PER HEAD OF PROTECTED POPULATION

To calculate the cost of surveillance per head of protected population, two series of expenses should be considered:

a- Basic expenses solely incurred for active surveillance.

b- Supervisory and administrative expenses including salaries, wages, allowances of Shahrstan Chiefs right up to the Director General; printing expenses, postage and telegraph expenses - light and fuel - rental of offices, etc. These expenses which are made for both surveillance and spraying are mentioned as hereunder:

Since spraying operations are carried out during three months of the year while surveillance generally lasts nine months depending on climatic conditions of various areas and existing possibilities, such expenses could be divided in proportion of 1/4 (for spraying) and 3/4 (for surveillance).

A. Basic expenses solely incurred for active surveillance

In order to calculate such expenses, we bear in mind that a jeep is used by four surveillance agents and an area supervisor. The pertinent expenses are as follows:

1- Repairs of one jeep during year	6,000 Rls	(\$.78.41)
2- Cost of petrol of one jeep "	30,000 "	(\$.392.15)
3- Depreciation " " " "	30,000 "	(\$.392.15)
4- Cost of surveillance equipment and non malarial medicines for four surveillance agents during year	10,000 "	(\$.130.70)
5- Cost of malarial medicines for four surveillance agents during year	20,000 "	(\$.261.40)
6- Salary and allowance of four surveillance agents during year	250,000 "	(\$.3267.97)
7- Salary and allowance of one area supervisor for year	68,000 "	(\$.888.88)
8- Salary and allowance of a driver for year	66,000 "	(\$.862.74)
Total	<u>480,000 Rls</u>	<u>(\$.6274.50)</u>

Yearly expenses of one surveillance agent $480,000:4 = 120,000$ (\$1568.62)

Monthly expenses of one surveillance agent $120,000:12 = 10,000$ (\$ 130.70)

Generally speaking a surveillance agent visits twenty-five villages during the month and the average population of a village in Iran is 250. Thus a surveillance agent visits and protects $250 \times 25 = 6250$ persons during 1 month. The cost of protecting one person is therefore $10,000:6250 = 1,6$ Rls. per month, and $1,6 \times 12 = 19,2$ Rls. per year.

B. Supervision expenses of surveillance, overhead expenses of office including salaries, wages, allowances payable to rank and file from the Shahrestan chief right up to the Director General, printing expenses, postage, telegraphs, lighting and fuel, rental of office premises, and expenses connected with laboratory equipment and microscopes donated to the Iran Government:

1- Salaries and allowances	45,000,000 Rls	(\$588,235.29)
2- Rental of offices printing light fuel postage, etc.	7,700,000 "	(\$100,653.59)
3- Cost of laboratory equipment and microscopes donated by Unicef	2,805,000 "	(\$ 37,400.)
Total	55,505,000 Rls	(\$725,555.55)

The above expenses which are made for all the surveillance activities, concern 850 surveillance agents throughout the year.

For one surveillance agent in one month:

$$\frac{55505000}{850 \times 12} = 5441 \text{ Rls. } (\$ 71.12).$$

Since one surveillance agent protects 6250 persons, the cost of protecting one person per month is $\frac{5441}{6250} = 0.8$ and per year is $0.8 \times 12 = 9.6$ Rls.

C. Thus the total cost of surveillance per person will amount to: $9.6 + 19.2 = 25.8$ or (\$ 0.33)

ANNEX 9

SUMMARY OF THE SURVEILLANCE ACTIVITIES WHICH TOOK PLACE
IN DIFFERENT YEARS AND THEIR COMPARISON

EMR/MS-Health-2/272

Year	Villages Under Surveillance	Population Protected	Slides Collected (Total)	Slides Prepared		Positive
				Less than Two years	More than Two years	
1956	4115	647737	93365	40432	52933	538
1957	15806	4218506	453654	227702	225952	7391
1958	19981	5465189	446070	222263	223807	4414
1959 *	24563	67931120	291514	151727	139789	1684

* Operations for 1959 are under continuation (This report is only for six months)