

a 61941

WHO/Ma.1/292 ✓
8 May 1961

ORIGINAL: ENGLISH

PASSIVE CASE DETECTION
IN THE MALARIA ERADICATION PROGRAMME
OF THE PROVINCE OF ALEPPO - SYRIA (UAR)

by

Dr Y. Kiladjian, M.D., D.T.M. & H.
Chief, Malaria Eradication Centre,
Aleppo, Syria (UAR)

1. INTRODUCTION

In the Province of Aleppo, which has a total population of 1 270 000, of whom approximately one-third live in malarious areas, those at risk are 31% of the country's total population under the malaria eradication programme.

In 1957 total coverage spraying was commenced with residual insecticide - DDT, dosage 2 gm/m², one cycle each year, lasting for three months, which apparently reduced the incidence of the disease in the Province to an appreciable extent.

By the end of the third cycle in August 1959, it became evident that it was most necessary to begin a process of case detection in the Province of one sort or another. However, from the beginning it was quite clear that for budgetary and other reasons active surveillance, although already functioning in the Province of Damascus and in part of the Province of Homs since July 1958, could not be applied in the Province of Aleppo as the sole method of case detection.

It thus became imperative that a less costly but equally efficient system should be applied to provide the data required, which automatically led to the adoption of passive case detection as the main source of information.

2. ORGANIZATION OF PASSIVE CASE DETECTION

2.1 Health Units and Laboratories

The first resource of passive case detection is naturally that of the existing health services in a country, namely: government hospitals, clinics, laboratories, dispensaries, etc. For this reason a ministerial circular was issued in August 1959

by the Minister of Health in response to and in conformity with the proposals made by the Malaria Eradication Centre of Aleppo and sent to all provinces with the object of ensuring that no case of malaria should be left undetected and that no case be reported unless confirmed by microscopic examination. This circular, required from every governmental and private medical and paramedical person the strict application of the following procedures:

- (a) To take blood smears of every fever case appearing in the malarious area at any time. This applies to medical or paramedical persons residing in the malarious area only;
- (b) To take blood smears from every suspected case (with or without fever) in both malarious and non-malarious areas. This applies to medical personnel only, in hospitals, private clinics, dispensaries or health centres;
- (c) To send all blood films examined and found positive in any laboratory, governmental or private, to the Malaria Eradication Centre of the province for confirmation.

In the main town of Aleppo, which is considered a non-malarious area, there are eight laboratories, one of which is governmental, one military and six private. These receive blood samples for microscopic examination for malaria from 22 governmental dispensaries, 188 private clinics, and 10 private hospitals, all located in the town of Aleppo, not counting the suspected cases received from the rural districts where there are no laboratories.

The blood slides in these laboratories are mainly collected from suspects (with or without fever), suspicion being based on the attending physician's decision. It was agreed upon and found practical that the slides reported positive by the above-mentioned laboratories should at once be submitted to the Malaria Eradication Centre for checking and re-testing of doubtful cases if necessary. All negative slides were to be reported on a written form signed by the responsible chief of the laboratory at the end of the month. This system has proved workable and good relations were established between the laboratory services and the Malaria Eradication Centre.

In the rural districts of the Province (malarious and non-malarious) with a population of approximately 776 000, there are two hospitals and fifteen dispensaries which are usually located in the district headquarters, each supervised by a medical officer, as well as twelve health centres located in the sub-districts each supervised by a sanitarian or a male nurse. All of the above 29 units were considered as malaria detection posts in the passive case detection system, 19 of which belonged to the malarious and 10 to the non-malarious areas. It is easily understandable that with this limited number, only a very small proportion of the entire rural community, living in 2504 villages, could be covered by such facilities.

In the Province of Aleppo, in the Syrian Region as a whole and probably also in most countries in the Middle East, the following difficulties arise when utilizing local health facilities for passive case detection:

- (a) Uneven distribution of the medical personnel. In the Province of Aleppo, out of a total of 247 doctors, 91% live in the main town of Aleppo and only 9% live in the rural areas;
- (b) Scarcity of dispensaries and health centres in many rural districts and sub-districts;
- (c) Lack of interest shown by the existing medical and paramedical personnel in the eradication programme of the country.

In the light of this knowledge, it became imperative to seek the collaboration of non-medical volunteers, and to establish on a trial basis a system of voluntary collaboration, as has been effectively instituted in Latin American programmes.

2.2 Voluntary Collaborators

In August 1959 the Malaria Eradication Centre (MEC) at Aleppo decided to embark on a trial, using voluntary collaborators for passive case detection in the rural part of the Province. This task was implemented by the MEC Director assisted by his six assistant malaria inspectors, who were trained in laboratory work and whose additional function is to supervise spraying operations during three months of each year.

The immediate aim of the MEC was to:

- (i) Select those villages in which voluntary collaboration was needed;
- (ii) Appoint the voluntary collaborators after thorough study of a list of nominees in each village, prepared as a result of repeated visits and enquiries in the area;
- (iii) Train the voluntary collaborators to take blood smears, to use a thermometer, to make use of the first-aid drugs supplied and to complete the necessary records; and
- (iv) Arrange for routine visits to the voluntary collaborators in order to supervise, collect blood smears and to replenish the supplies.

It cannot be emphasized strongly enough that the success or failure of the whole programme of voluntary collaboration depends on the careful completion and planning of each of the points listed above. As this trial has so far been without precedent in this part of the world, it was natural that it should be instituted on a limited scale, especially as the number of supervisors was also limited to the already existing team of inspectors. Hence it became necessary to make a very limited selection of those villages where voluntary collaborators could be appointed.

In selecting a locality within a malarious district for the assignment of a voluntary collaborator the MEC was influenced not so much by the size and number of inhabitants of each village as by its importance from the malariological and entomological aspects. Similarly, when it was necessary to decide on the number of voluntary collaborators in each district, the decision was based solely on the epidemiological position of the district rather than on its size in number of villages and surface area. No voluntary collaborator was appointed in any village where a health unit already served as a malaria detection post for the health service.

Voluntary collaborators were also assigned in non-malarious areas whose population has frequent contact with malaria-infected parts of the province, with the intention of detecting infections originating in a malarious district and appearing in a non-malarious area.

No difficulty was encountered in the selection and training of the voluntary collaborators; this was done in the following way:

As one of the few attractions of being a voluntary collaborator is the enhanced social status this position offers in a rural community, it is of importance not to offend the existing powers of such a community, and this means first of all the village headman. The system employed therefore was first to ask him for his suggestions, pointing out the requirements, thus giving him the opportunity to offer himself for the job. It was principally in this way that the important and necessary co-operation of the village authorities was guaranteed. It is interesting to note that out of the 120 voluntary collaborators, 31 were village headmen.

It may also be of interest here to give an account of the professional groups to which the 120 voluntary collaborators belong (Table I).

TABLE I. PROFESSIONAL STATUS OF
VOLUNTARY COLLABORATORS IN THE ALEPPO AREA

	Numbers
Farmers	66
Village headmen	31
Shopkeepers	7
Barbers	5
Village guards	2
Religious leaders	2
Messengers	2
Others	5

No school teacher is among this group, because most of them are not permanent residents of the villages and are away during the vacation months, which coincide with the transmission season.

Three voluntary collaborators, 2.5% of the total number engaged, declined further collaboration at the end of the second and third months because of new business obligations or change of residence.

In the course of their training, the collaborators were acquainted with the purpose of their work and the technique of taking blood slides. It was surprising to see with what ease most of them acquired the technique of pricking a finger and preparing a blood slide, both thick and thin films. There was no difference between a farmer accustomed to manual labour, and any other non-manual occupation. This proves that persons from nearly any vocation can be used as collaborators providing they can read and write.

Each voluntary collaborator was equipped with a tin box containing the items necessary to perform his task; a slide box to keep the blood films until collection, clean slides, cotton wool, a bottle with alcohol, pricking needle, thermometer and a pad of forms. For reasons of public relations he had a few simple drugs to distribute for headaches, diarrhoea, etc.

Although it might sound a trivial matter, it was observed that these small boxes with the essential equipment meant a lot to the voluntary collaborator. The white-painted box with the red inscription of the Malaria Eradication Service and the serial number is always kept in an easily noticeable place in the house as a visible sign of his importance in the community. Such boxes are produced locally and are fairly cheap.

Probably one of the most important factors in the organization of passive case detection, and especially with a network of voluntary collaborators, is that of constant supervision. Proper supervision has several aims:

- (a) To maintain permanent contact between the MEC and the malaria detection posts;
- (b) To supervise and improve on the work performance and technique;
- (c) To call for the collected blood smears and replenish all supplies;
- (d) To promote health education in the villages.

For this purpose the six assistant malaria inspectors, employed by the Malaria Eradication Centre in Aleppo, visited each post on an average once every 20 days. Under the conditions prevailing in the Aleppo Province the blood smears have to be

collected by the MEC itself as postal facilities are very limited. With the extension of the passive case detection system it is envisaged that such collections will be made at shorter intervals.

The arrival of the supervisor in a village in the official MEC car attracts the immediate attention of the villagers and helps to remind them each time of the existence of a malaria detection post in their midst and the work of malaria eradication.

The total number of voluntary collaborators was raised to 120 of whom 79 were resident in malarious areas and 41 in non-malarious areas of the Province. (See Table II for distribution of malaria detection posts.)

TABLE II. DISTRIBUTION OF MALARIA DETECTION POSTS (MDP)
IN RURAL AREAS OF THE PROVINCE OF ALEPPO
(October 1960)

District	Malaria situation	Health Units			Voluntary Collaborators		Total MDP
		Hospital	Dispensary	Health Centre	Malarious area	Non-malarious area	
Ain-Arab	half of the area malarious	-	1	-	4	7	12
Jarabloss	mainly malarious	-	1	1	13	-	15
Membidge	mainly non-malarious	-	1	-	1	8	10
Azaz	partly malarious	-	1	-	9	2	12
Bab	non-malarious	1	-	-	-	5	6
Jabal Sam'an	non-malarious	-	2	4	-	11	17
Afrin	mainly malarious	-	1	1	19	-	21
Harem	malarious	-	2	2	6	-	10
Jisr Cheghour	malarious	-	1	1	16	-	18
Idlib	partly malarious	1	3	1	4	2	11
Ma'arra	mainly non-malarious	-	2	2	7	6	17
		2	15	12	79	41	149

3. ACTIVE CASE DETECTION

Active case detection in the Province of Aleppo has had to be carried out in a sporadic manner as the only available personnel were the six assistant malaria inspectors whose primary function is the supervision of passive case detection and, during three months of each year, of spraying operations as well. Their house-to-house fever case surveys were limited to those villages in which it was known that a larger number of fever cases existed. No one has yet been assigned to the post of surveillance agent in the Malaria Eradication Centre at Aleppo.

4. DISCUSSION OF FINDINGS

The findings of surveillance operations during the first 14 months of the experiment with passive case detection in the Province of Aleppo are given in Tables III and IV.

TABLE III. SLIDES COLLECTED AND MALARIA CASES FOUND BY SOURCES OF CASE DETECTION IN THE PROVINCE OF ALEPPO

(1 September 1959 to 31 October 1960)

	Malarious area (attack phase)	Non-malarious area	Total
Approximate Population	352 000	918 000*	1 270 000
PASSIVE CASE DETECTION			
Number of Malaria Detection Posts	98	59**	157
Health units:			
slides examined	864	984	1 846
slides found positive	-	13	13
slide positivity rate	-	1.32%	0.70%
Voluntary collaborators:			
slides examined	5 808	2 927	8 735
slides found positive	30	3	33
slide positivity rate	0.52%	0.10%	0.38%

TABLE III. SLIDES COLLECTED AND MALARIA CASES FOUND BY SOURCES OF CASE DETECTION IN THE PROVINCE OF ALEPPO (continued)

(1 September 1959 to 31 October 1960)

	Malarious area (attack phase)	Non-malarious area	Total
ACTIVE CASE DETECTION			
Fever case survey:			
slides examined	5 624	2 778	8 402
slides found positive	3	1	4
slide positivity rate	0.05%	0.04%	0.05%
EPIDEMIOLOGICAL INVESTIGATION			
slides examined	1 397	-	1 397
slides found positive	66	-	66
slide positivity rate	0.47%	-	0.47%
TOTAL slides examined	13 693	6 689	20 382
slides found positive	99	17	116

* including Aleppo town

** including 8 laboratories in Aleppo town

TABLE IV. MALARIA CASES BY ORIGIN OF INFECTION AND AGE-GROUPS
(1 September 1959 to 31 October 1960)

Origin of infection	Age-groups (in years)					Total
	Under 1	1-4	5-9	10-14	15 and over	
Indigenous	-	5	-	1	-	6
Relapsing	-	-	9	7	14	30
Imported*	1	3	2	2	8	16
Not individually investigated**	2	15	30	10	7	64
TOTAL***	3	23	41	20	29	116

* Imported from other Provinces in Syria still under attack phase.

** These cases were encountered during epidemiological investigations in the Ghab area; it can be assumed that all these cases are either indigenous or relapsing.

*** 104 of the total cases were originally infected in the Ghab area.

Comparing the number of slides produced by the different sources of case detection, the voluntary collaborators ranked highest with 43%, closely followed by active case detection with 41%, while health units collected 9% of all slides. Another 8% of the slides were obtained from epidemiological investigations in the neighbourhood of confirmed cases.

As far as the malaria cases are concerned, the voluntary collaborators found 33, whilst health units and house-to-house fever surveys revealed 13 and 4 cases respectively. However, 57% of all cases were detected by epidemiological investigations. Considering that epidemiological investigation is always carried out in a specially selected group of people, its effectiveness cannot correctly be compared with the case-finding methods of active and passive case detection.

Expressing the efficacy of these methods by the slide positivity rate (SPR) and the proportion of positive cases found, the following comparison can be made:

TABLE V. SLIDE POSITIVITY RATE AND PROPORTION OF POSITIVE CASES FOUND BY DIFFERENT DETECTION METHODS

Detection method	Percentage of positive slides (SPR)	Proportion of positive cases found out of total positive cases
Health Units	0.70	11.2% (13/116)
Voluntary Collaborators	0.38	28.5% (33/116)
ACD: house-to-house fever surveys	0.05	3.5% (4/116)

Although the slide positivity rate was higher among the slides collected by health units than in those coming from collaborators, this is outweighed by the fact that two and a half times as many positive cases were found by the latter method. It was evident that under the prevailing conditions of the trial, active case detection was much inferior to passive case detection.

It is of interest to note that 17 out of 50 cases found by detection methods occurred in the non-malarious area, 7 of which were reported by the laboratories of Aleppo town and could all be classified as imported cases from malarious areas outside the Province of Aleppo.

Deducting the number of slides examined and the positives found by the laboratories of Aleppo town, it can be seen that the 29 rural health units yielded only 1185 slides throughout the period under review, 6 of which were confirmed positive (SPR = 0.5%). It is regrettable that, in spite of great efforts on the part of the Malaria Eradication Centre and the ministerial decree mentioned above, the co-operation received from the rural health units left much to be desired.

All the malaria cases detected during the past 14 months were due to P. vivax infections.

Although it is not the intention of this paper to discuss the epidemiology of malaria in the Province of Aleppo, the information provided in Table IV calls for a brief explanation of the situation existing in the Ghab Valley. This is an area of approximately 600 km² along the ridges of the Orontes River, belonging partly to the Province of Aleppo and partly to the two Provinces of Hama and Lattaquia, previously an area of extensive swamps, today totally covered by cultivation projects, and which continues to possess a high potential of malaria endemicity. It remains today the sole malaria focus of the Province of Aleppo. The topography of its territory and the character and habits of its population continue to offer favourable conditions for malaria transmission. A high proportion of nomads live here in tents, and in mud and straw shelters. A constant migration of seasonal agricultural labourers takes place, as well as an influx of permanent settlers into the area. It is therefore understandable that nearly all the cases detected were related to this large malaria focus.

5. CONCLUSIONS

Pressed by the need to keep to a minimum the cost of surveillance operations in the Province of Aleppo, passive case detection was adopted, on a trial basis, as the main source of detecting the remaining malaria cases, following the American example. The results obtained during the first 14 months of this experiment are available for assessing the efficacy of this method.

Principally two types of Malaria Detection Posts are to be considered; the existing health units, and voluntary collaborators. Due to the very limited number of rural health stations - 29 in all - a network of voluntary collaborators was immediately organized, of whom 120 were finally engaged.

With a few exceptions the co-operation received from the health units was not what had been expected in spite of the great efforts made on the part of the Malaria Eradication Service. More time and persuasion is needed before the existing health facilities can be utilized as productive and continuously-operating Malaria Detection Posts.

The system of voluntary collaborators, entirely new to Middle Eastern countries, on the other hand, has proved to be extremely satisfactory. Its success is attributed to the careful selection of the right people and the close and constant contact which is maintained between the Malaria Eradication Centre and each collaborator by supervisory visits of full-time malaria inspectors. Experience has shown that nearly any villager, provided he can read and write, is able to acquire the necessary skill to function as a voluntary collaborator.

During the period under review, the rural health units collected 1185 slides while at the same time voluntary collaborators produced 8735; 33 of the confirmed cases were found by voluntary collaborators and only 6 by the rural health units. The figures themselves are a clear indication of the value of voluntary collaborators in passive case detection.

Active case detection was only performed sporadically owing to lack of surveillance agents. Epidemiological investigations in the neighbourhood of confirmed cases, however, were another very productive source, due to the existence of a large malaria focus in the Ghab Valley.

It is our impression that the system of voluntary collaborators can be considered as an efficient means of case detection under the conditions prevailing in the Province of Aleppo, which are similar to those in other parts of Syria and other Middle Eastern countries. If a staff of well-experienced supervisors is on hand, one can expect a collaboration network to be instituted within the space of a few months. The costs are not high as they cover only supervision and laboratory services. Passive case detection mainly based on a voluntary collaborator system can therefore be regarded as a profitable supplement to active case detection, hence reducing the overall cost of surveillance operations.