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DIFFICULTIES EXPERIENCED IN MAINTAINING TOTAL COVERAGE DUE TO FACTORS RELATED TO PHYSICAL, ENVIRONMENTAL, OR HUMAN CUSTOMS AND HABITS

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In carrying out a malaria eradication programme, the most important, as well as the easiest, most economical and most effective weapon for interrupting the transmission of the diseases is the spraying of buildings by residual insecticides.

If the spraying programme with full coverage is carried out for a limited period, by effective and residual insecticides in a particular area, we can reasonably expect that the eradication programmes are being carried out successfully and will attain the desired results.

With regard to the system used in spraying and the effect of the residual insecticides, irrespective of work facilities and techniques which have become standard, the four following factors are important.

1. The sprayman,
2. The type of buildings,
3. People's habits and customs,
4. The facilities.

1. The sprayman.

After selecting the kind of insecticide and equipment needed, the primary effective factor in the execution of a spraying programme is the sprayman. The kind of spray pumps used in Iran are Hudson pumps, 710S-WHO-01. (with pressure regulator) using 8002 nozzle tips.

The sprayman must use 40 pounds pressure and maintain a distance of 46 centimetres from the nozzle tips to the wall surface, and spray 19 square metres per minute.

In Iran, in order to achieve this, each year before the commencement of the spraying, the labourers undergo training for seven to ten days, in order to be ready for their job.

As the spraying operations for each period in each area should not exceed two months, the spraymen are engaged on a daily basis. This factor obviously produces difficulties in executing the spraying programme, and in achieving total coverage.

1.1. The question of training the spraymen: Since a considerable number of men (about 5,000) should start work in about 30,000 villages in a certain season, their training is not an easy task.

In addition to this, for some reason or other, they are sometimes dismissed and new men are employed who require new training and instructions.

1.2. Since the workers are aware that they are engaged to work in the programme for a limited time, they tend to show no real interest in their work.

1.3. Since the spraying operations coincide with agricultural activities, and since the majority of labourers are engaged for the latter purpose, it is not easy to provide the required number of workers for spraying. During the spraying season some workers leave the spraying and return to the land to do agricultural work. New people have to be engaged to replace them. These must, of course, be given new training.

1.4. The spraying season in the southern area of Iran should be carried out in summer in order to stop the transmission of the disease. But unfortunately it becomes exceedingly hot and dry during this season; the water sources dry up; spraying operations become difficult, and the execution of the programme becomes unbearable for the workers. To compensate for these obstacles, necessary means have been provided. The chief of Shahristan, the district leaders and the gruh leaders have been well trained in various courses of instruction, and the spraymen are given training by their supervisors.

No sprayman is allowed to work unless he is fully ready to carry out the spraying programme. On the other hand, some workers have already worked in the programme during the preceding year and have sufficient experience and skill. Also the method of supervision is so organized that the spraymen have to carry out the spraying operations in accordance with instructions which they have received.

For this purpose one foreman is appointed per five sprayingmen. One gruh leader supervises two foremen and ten spraymen. Three gruhs are supervised by one district leader. The whole group is under the supervision of the Ostan chief. Visits to the field, when needed, are paid by the Headquarters authorities.

This ascertains that the spraymen have fully carried out their tasks on the total coverage spraying.

2. The type of buildings.

In a vast country like Iran with an area of 1,600,000 square kilometres and with its varying climatic conditions, the human dwellings, and the material used vary in different areas and during various seasons of the year.

To carry out total coverage, the type of buildings are important from two points of view.

2.1. The site of the buildings.

2.2. The kind of material used in construction of the buildings.

2.1. The site of the buildings. Accessability to the actual site is important. In the plains, the villages and houses are close together and are easy to reach. The programme is therefore carried out in a straightforward manner. But in the mountainous areas (e.g. the Alburz and Zagros ranges) or in places where the whole area is covered with jungle, carrying out the programme in the scattered dwellings, needs more time and greater expenses. This is specially felt in the forest-covered hills of the Northern Alburz where the number of scattered houses is noticeable. For the execution of the programme in such areas, careful plans and programmes suitable for the condition of each district should be prepared.

The road problem is also of considerable importance, especially when the rivers overflow during the operational season. Many difficulties are thereby encountered.

2.2. The kind of material used in construction of the buildings: The material employed in the construction of dwellings, such as mud, stone, wood, tree-branches (for huts) and material used for tents, have an important influence on the durability and effect of the insecticides.

From the point of view of the eradication programme, we can classify the said dwellings into the two following categories.

2.2.1. Permanent dwellings.

2.2.2. Temporary dwellings.

2.2.1. Permanent dwellings: The permanent dwellings are generally built from ordinary materials such as wood, mud, stone etc., But in the Northern Ostan almost all buildings are constructed of wood. Their interior wooden surfaces, when subjected to spraying, maintain the effect and durability of the insecticide in that damp area for a longer period.

In other areas however, where the majority of surfaces are of mud or plaster, the insecticide employed is quickly absorbed and the durability of the insecticide varies with the humidity and temperature of the region.

In the case of permanent buildings constructed of mud, especially sheds made for animals, or small man-made caves, the particles of dust which rise up as a result of the movement of the animals in such places settle on the surface of walls and thereby the insecticide used on the surfaces usually drops down with this dust. Where this is likely to occur it is essential to clean the wall surfaces thoroughly and then spray them with insecticide.

2.2.2. Temporary dwellings. Temporary buildings are used in two different ways, and their existence constitutes one of the important difficulties in the execution of total coverage.

Temporary buildings (e.g. huts) which are built of tree-branches in the open air, are in common use in the majority of the Central plateau villages and Southern Ostan. The inhabitants of these villages build such dwellings in the vicinity of their villages and use them as shelters from the heat and insects during the summer. Unfortunately, in many cases such huts are built after the completion of the spraying programme, and requir re-spraying and the re-assignment of workers to such areas in order to complete the spraying.

Tents are usually made of thick materials and are used by tribes. They are set up temporarily for a few days in one place and then are transferred to another. Also, in the Northern and Central regions, after the end of the winter, and before the construction of huts, the inhabitants of villages dwell in tents which are set up in the vicinity of their villages.

With respect to the durability of insecticides in the buildings of the first category, the execution of a total coverage programme encounters the following difficulties

a) Since the whole frame-work and ceiling of such constructions are built of tree-branches only part of their surface will be covered with the insecticide used. The reverse side of leaves and some cavities in the frame-work and ceiling will be untouched by the insecticide.

b) In general, almost all or part of such dwellings are repaired or removed from time to time, and new tree-branches are used.

c) As a result of wind and rain, the effect of insecticides disappears in a comparatively short period, and repeated spraying will be necessary.

d) In tropical regions, during the hot season, the people sprinkle water on their huts in order to keep them cool. This also tends to wash off insecticides sprayed on them.

A more serious problem is encountered in tents. This is the question of the moving of tents from one place to another. Most of the DDT used in spraying is completely wasted owing to this movement, and it becomes necessary to repeat the spraying after a short time.

In the case of tents used as permanent abodes in any locality, these are often shaken by the wind and the insecticide is blown to the ground.

External resting places of anopheles, such as the mouths or openings of wells and quanats, inside the cisterns, cereal store-rooms and other outside shelters such as holes in trees or crevices in stones and caves made the execution of the total coverage very difficult.

3. People's Habits and Customs.

Here the most important problem is tribal migration which is outside the scope of the present discussion. After that the important problems which require consideration are as follows:

3.1. Local movement of people.

3.2. Construction of temporary dwellings.

3.3. Plastering - painting, hanging of pictures, etc.,

3.4. Outdoor resting and sleeping habits.

3.5. Silk-worm cultivation.

3.6. Lack of cooperation with and sometimes opposition to the Eradication Programme.

3.1. Local movement of people With regard to local movement, it has already been mentioned that in order to avoid the heat of summer, the inhabitants of villages live in tents and huts outside their villages; but another difficulty which is encountered in this respect, is the question of the locked houses found in villages during the spraying season. It is necessary to locate the owner and ask him to unlock his house.

3.2. Construction of temporary dwellings: The subject of temporary dwellings has already been dealt with.

3.3. Plastering - painting, hanging of pictures, etc.,. In the majority of villages the inhabitants are accustomed to plaster the rooms in which they live once or twice a year. Sometimes they do this after the spraying operations, in which case the insecticide

on the wall surfaces is covered up. At times also, the inhabitants clean the wooden walls and doors after the spraying and wipe away completely the effect of insecticides. Furthermore, there is no doubt that pictures and maps hung on walls also cover up a certain proportion of the sprayed surfaces.

3.4. Outdoor resting and sleeping habits: In a considerable portion of Iran, the amount of humidity in the warm and temperate zones is excessive, so that people are accustomed to sleep in the open air during the summer. The locality they choose for this purpose is sometimes in the vicinity of the natural resting places of vector anopheles. For this reason it would be necessary to spray these anopheline shelters. There is no doubt that the spraying of such places, especially caves, in a total coverage programme, would be extremely difficult.

3.5. Silk-worm cultivation: In the Northern Ostan and in Azarbaijan, the cultivation of silk-worms is customary, and in order to protect the silk-worms it is necessary to carry out spraying when this cultivation is completed.

3.6. Lack of cooperation and opposition: Lack of cooperation with, and sometimes opposition to the execution of the programme by the people is found irrespective of the fact that in the majority of cases the inhabitants of villages welcome the spraying programmes, and are willing to render all kinds of cooperation and aid, in some cases they refuse to cooperate as required and thus cause difficulties in the execution of the operations.

4. Facilities.

It is evident that the execution of total coverage will require equipment and certain facilities.

4.1. Facilities and equipment required:

4.1.1. Spraying pumps.

4.1.2. Spare parts for pumps and other facilities required for repairs; also facilities needed in the preparation of the insecticide suspension.

4.1.3. Cars for the transport of workmen and equipment.

4.1.4. Horses, or mules for transporting equipment in the mountainous regions.

4.1.5. The required amount of insecticides which should be forwarded to the operational centres before the commencement of the programmes.

Endeavours are contunually being made in Iran's Eradication programme to have all facilities and equipment available before the operations start, in order to be able to begin the operations at the right time and complete them on schedule.

4.2. Power of Operations:

Unfortunately no law has been yet enacted in Iran for the execution of the Malaria Eradication operations. There are however, some health laws which can be utilized in facilitating the execution of the programme. It is expected to have such laws prepared and approved.

For the time being, and in this connection, numerous circulars are being forwarded through the Ministry of Health and the Ministry of Interior to the Governors, region chiefs and village headmen. These individuals are responsible to render maximum help and cooperate fully with the Malaria Eradication agents.

With regard to the above-mentioned problems and in order to achieve the aim of total coverage, the following points have always been and still are of important consideration:

i. Preparation of all work facilities and required insecticides in the operational centres before the commencement of the programmes.

ii. Training of spraymen so that they will be thoroughly acquainted with their duties and be convinced of them.

iii. Establishment of a complete supervision system so that the workmen would be compelled to carry out their duties in accordance with instructions received.

iv. After the completion of the main spraying, mobile supplementary groups are assigned to the field of operation in different periods in order to complete the previous spraying operations. These groups are provided with the data of the former unsprayed places so that they can take action as regards their spraying and also the spraying of any newly built houses.

v. Utilization of health education through the technical agents or through the employees who are trained for this purpose; showing of public health films, organizing conferences etc., in order to attract the cooperation of the public.

By observing the above mentioned views, and in spite of numerous obstacles and difficulties, total coverage has been, in many cases, accomplished thoroughly and in time.