

MALARIA CONTROL - MULTISECTORIAL APPROACH

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The incidence of malaria results from several factors, specially those of biological, economic and social origins.

In Brazil, in that last 20 years, the great majority of malaria disease has occurred in the Amazon Region. The epidemiological investigations of the registered cases in other regions have shown that most of the infections took place in this region. In this big region equivalent to 5 million km², the distribution of the disease is not homogenous in time and space.

The incidence is concentrated in some states. In these states, some counties have the highest incidence. Finally, inside the counties, the malaria incidence is concentrated in certain localities.

What is determining this profile of malaria distribution in Brazil, in the last 20 years?

The end of 60's and 70's decades mark the intensive and disordered occupation of several areas of the Amazon Region by populations from others regions of the country. These migrations were generated, at the same time, due to the evasion of rural workers from the South and Southwest where the implementation of mechanical and agricultural activities reduced the opportunity for jobs and land possession. These farmers were attracted by the possibility to work on the construction of highways, railroads, hydroelectric dams, implementation of cattle-raising and mining projects.

When the population were located in inadequate conditions of living and work, the incidence of malaria abruptly increased and the traditional measures of control were shown to be insufficient for containing this increase.

The basic principles of the global program of malaria eradication, supported by the World

Health Organization, were not applicable to this region. They were:

1. Malaria transmission is fundamentally inside houses;
2. Absence of an animal reservoir and, therefore, the depletion of parasite in man interrupts the transmission;
3. Availability of a insecticide with prolonged residual effects, that is applied on surfaces and acts by contact - DDT.

The precarious living conditions neutralize the first and third malaria eradication principles, since the shelters where the population lives does not really constitute a protected domicile, with total or partial absence of lateral walls, so the efficacy of the DDT is drastically reduced. In addition, even when internal walls are present, the existence of an important fraction of outdoor transmission of the disease, makes innocuous the use of insecticide in the houses.

Item 2, is still true, in the epidemiological sense as human malaria does not have important reservoir animals. However, in the 60's decade the appearance of *Plasmodium falciparum* resistant strains to anti-malarial drugs usually used in the field such as the 4-aminoquinolones, led to a delay in the depletion of parasites in man and, consequently, the maintenance of the source of anopheline infections for very long periods. The new drugs that emerged such as the 4-aminoquinolones can not be further distributed due to their side effects, high costs and the rapid appearance of parasite resistance. An example of these new drugs is the association of pyrimethamine - sulfadoxine.

At the beginning of the 70's decade the malaria eradication program perceived the impossibility of short term malaria eradication in

the Amazon, with the available technical resources. So, for malaria control, Brazil was divided in two areas: one of short term eradication (outside the Amazon) and another of long term eradication (the Amazon Region).

Nevertheless, the new strategies for disease control were not always easily absorbed by the program that generally retains the measures already proposed for malaria eradication, although they are not efficient.

In special situations, meanwhile, different strategies were adopted for the application of available measures, including those considered complementary by the program. In these situations, the change in the strategy was based on the understanding of extra-sectorial factors that can determine the high incidence of malaria (disordered migration, precarious dwellings, favorable work transmission conditions) and the obtention of support and resources from the economic sectors involved in the development of projects with social and environmental impact, for the application of malaria control measures.

This strategy resulted in a very satisfactory control level. Thus, the paving of the Cuiabá (MT) - Porto Velho (RO) Road and the construction of the Carajás - Itaiqui (Pará - Maranhão) Railroad were completed before the expected time. The construction of the Balbina's hydroelectric dam in the Amazon state also was not delayed by malaria. The mechanical mining in Amazonas, Rondônia and Pará, and the private cattle-raising in Pará and Mato Grosso have no problems with malaria, when they applied the control measures recommended by the Ministry of Health (Sucam).

What are those measures?

1. Construction of houses or shelters with complete lateral walls;
2. Early and repeated (six months) applications of insecticides inside of the houses;

3. Houses and camps located as far as possible from anopheline breeding places;

4. Elimination of the anopheline breeding places by drainage or dirt-fill, when it is possible;

5. Use of larvicide in non eliminated breeding places;

6. Use of mosquito nets at night;

7. Use of nets in doors and windows of the houses;

8. Facilities for early diagnosis and prompt treatment of the feverish cases.

The hydroelectric, road construction and agricultural sectors began to offer material conditions so that the control agency of the Ministry of Health can develop the actions that the enterprises could not apply by themselves. This comprised support for transport and lodging for the Ministry's staff, acquisition of equipments and supplies and the attention to the already cited recommendations, in relation to the type of dwelling and its localization.

In spite of the lack of prospective studies establishing, in malaria control projects, the cost/benefit advantages of the preventive actions, it was possible to evaluate indirectly through the interest of the private enterprises, that it is economically beneficial to invest in disease control measures.

If we can act on the risk factors of high incidence of malaria, even when they are not correlated to the health sector, a drastic reduction of the malaria incidence will unquestionably occur.

In areas of migrant populations when this intersectorial articulation is not obtained, the malaria incidence increases and control measures exclusively developed by the health sector are unsuccessful.