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# CONTROL OF DENGUE FEVER IN BANDEIRANTES, PARANÁ: IMPORTANCE OF THE CONTINUITY IN THE PREVENTIVE ACTIONS

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## ABSTRACT

*It was analyzed the results of the health agents' work in the routine of the section of endemics control of the Municipal Health Dept. for control of Aedes aegypti and Aedes albopictus in Bandeirantes, Paraná. The health agents work is accomplished through sweeping cycles, generating indexes of larva Breteau index (I. B.) and Predial index (I. P) infestation. It was evaluated the needs for preventive measures and education of the population, since in the months in which the sweeping work with cycles of visits with the agents was accomplished from January to December of 2001 there was a decrease of positive cases for dengue fever, while in periods when cycles were interrupted there was an increase in the number of positive cases. Again, when the sweeping cycles where restarted in the year 2002 there was decrease in the number of the dengue fever positive cases. This proves the need to maintain health agents dengue fever work to accomplish sweeping cycles and to help the population to learn to care for and proceed with preventive measures of this disease.*

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## INTRODUCTION

Dengue Fever is the top resurgent disease in the world. Its agent is the Arbovirus of the genus Flavivirus which has four serotypes DEN-1, DEN-2, DEN-3 and DEN-4. Many species of *Aedes* mosquito can act as transmitter of the virus. Presently, there are two species in Brazil: *Aedes aegypti* and *Aedes albopictus*.

The activity of the reemergence of infection by Dengue Fever virus can be detected by three or four serotypes of this agent that are increasing its magnitude and geographical extension since the beginning of the 20 century (BARRETO et al., 1999). *Aedes aegypti* originates from Africa from where it was passively transported to the American continent. *Aedes albopictus* is a species from the Asian jungle. In the last years, due to the intense intercontinental trade of tires by maritime transport, it has been disseminated into the Americas (BARRETO et al., 1999).

The increase in the production of cars and, therefore, of used tires, as well as disposable packs that are not adequately collected after use favors multiplication of the mosquito. The transmission chain is established by a structure build up of favorable political, economical and cultural conditions (TAUIL, 2002).

The *Aedes aegypti* was eradicated in Brazil between 1955 and 1973. Due to difficulties faced by the Entomologic Surveillance in preventing the reinfestation that occurred in the late 70's and beginning of the 80's, the vector mosquito was reintroduced and has installed definitely in the country (MINISTÉRIO DA SAÚDE, 2001).

One of the main challenges of vector transmitted diseases is to assure the effective participation of the community in its control. Presently, the only vulnerable link in the chain of Dengue Fever transmission is the vector, which is fought with preventive measures (TAUIL, 2002).

The fight against the vector conducted in the municipality of Bandeirantes included actions such as the elimination and / or treatment with larvicides in places where the mosquito lays its eggs; nebulization of insecticides at ultra-low volume with portable or heavy equipments to eliminate adults mosquitoes during peaks of transmission of Dengue and educational activities to promote the participation of the community.

Health agents have the responsibility to visit houses to identify focus and to destroy and prevent the formation of places where

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mosquitoes can lay their eggs, preventing the reproduction of foci and informing the community on the ways to prevent the proliferation of the vector (MINISTÉRIO DA SAÚDE, 2001).

The present study aims to collect data on the work done by health agents in fighting Dengue and to stress the importance of a continuous work in this regard.

## MATERIAL AND METHODS

Bandeirantes is a town in the north region of Paraná (50° 22' W, 23° 06' S) in an area of 445.4 km<sup>2</sup>. The resident population is 32.385 being 25.567 urban and 6.818 rural (MELO, 2001).

Data are based on the institutional activities of District Health Department obtained in a survey cycle conducted by 13 agents of Dengue Fever Fight under the supervision of a group leader and a responsible head, which are evaluated by the 18th Health Regional Division in order to control the quality of services by two visits a year. The cycles or area coverage comprises two visits to all properties in the city for larvae collection, treatment of containers that may act as nursery for larvae and to educate the community.

All recipients with water are inspected with a larvae-taker, mainly in cases of tires. Larvae and pupes found are stored in small glass tubes with alcohol 70%. The number of larvae or pupes did not exceed 10 for each tube.

The identified foci were showed to the households and instruction was given on the need for protection and better destination of stored goods (MINISTÉRIO DA SAÚDE, 2001).

The agents proposed some orientation activities that included the participation of the owners themselves in actions such as the elimination of water from recipients preventing the reproduction of the vector, breaking the cycle and therefore decreasing the infestation rate.

The edification index was used to evaluate the infestation, which indicates the percentage of properties with positive result for the exam of larvae and the Breteau index that indicates the percentage of recipients with a positive exam for larvae in each property (GOMES, 1998).

## RESULTS

TABLE 1 shows the Breteau and edification indexes for the year 2000, in which five cycles were done starting in January and

ending in December, without interruption. In this period it was obtained a decrease in the indexes both for *Aedes aegypti* and *Aedes albopictus*. Along the year 2000 four suspicious cases were detected in the municipality, although none was confirmed.

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TABLE 1 – Edification infestation (EI) and Breteau index (BI) in the municipality of Bandeirantes-PR in 2000.

Cycle at the end of the period	month	<i>Aedes aegypti</i>		<i>Aedes albopictus</i>	
		EI (%)	BI	EI (%)	BI
I	January	2.10	3.05	0.19	0.19
I	February	5.63	6.61	3.65	3.95
I	March	8.56	9.30	5.60	5.92
II	April	1.01	1.07	0.54	0.60
II	May	0.77	0.80	0.27	0.27
II	June	1.05	1.05	0.46	0.46
III	July	0.52	0.52	0.16	0.16
III	August	0.23	0.23	0.13	0.13
IV	September	0.20	0.20	0.06	0.06
IV	October	0.22	0.22	0.05	0.05
V	November	0.51	0.53	0.13	0.13
V	December	0.69	0.72	0.09	0.09

In 2001, only three cycles were conducted starting in March and ending in July. During the cycles it was observed a decrease in the indexes of infestation (TABLE 2).

TABLE 2 – Edification infestation (EI) and Breteau index (BI) in the municipality of Bandeirantes-PR in 2001.

Cycle at the end of the period	month	<i>Aedes aegypti</i>		<i>Aedes albopictus</i>	
		EI (%)	BI	EI (%)	BI
I	March	3.85	4.19	2.53	2.71
II	April	2.61	2.81	1.84	1.93
II	May	1.56	1.60	0.44	0.48
II	June	1.36	1.43	0.79	0.81
II	July	1.28	1.34	0.36	0.36

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In January, February and in the months from August to December 2001 the work of the agents was interrupted. Only selected places, strategic points considered as vulnerable to the introduction of the vector, were assisted. The indexes show variations that indicate the lack of efficiency of their use in control situation (TABLE 3). Along 2001 there were 202 suspicious cases of Dengue, being 112 confirmed. In January and February 2002 the inspection was also done only in the so called strategic points.

TABLE 3 – Edification infestation (EI) and Breteau index (BI) for strategic point in the municipality of Bandeirantes-PR in 2001.

Month	Number of edifications	collected samples	<i>A. aegypti</i>		<i>A. albopictus</i>	
			EI (%)	BI	EI (%)	BI
January	41	11	14.60	21.95	4.88	4.88
February	04	12	0.00	0.00	100.00	250.00
August	174	18	0.57	0.57	1.72	1.72
September	124	12	0.81	1.61	0.00	0.00
October	134	17	0.00	0.00	4.48	5.22
November	87	04	1.15	1.15	0.00	0.00
December	37	17	10.81	10.81	16.22	35.14

In 2002 the cycles were started in March while the Breteau and Predial indexes were elevated. In July the indexes showed some reduction as well as the number of suspicious cases (67) and confirmed ones (11).

TABLE 4 – Real state infestation (EI) and Breteau index (BI) for strategic point in the municipality of Bandeirantes-PR in 2002.

Month	<i>A. aegypti</i>		<i>A. albopictus</i>	
	EI (%)	BI	EI (%)	BI
January	34.48	37.93	31.03	44.83
February	13.11	14.75	13.11	14.75

TABLE 5 – Edification infestation (EI) and Breteau index (BI) in the municipality of Bandeirantes-PR in 2002.

Cycle at the end of the period	month	<i>A. aegypti</i>		<i>A. albopictus</i>	
		EI (%)	BI	EI (%)	BI
I	March	6.13	6.61	3.18	3.21
I	April	2.06	2.13	1.68	1.78
I	May	4.11	4.50	2.53	2.91
II	June	2.06	2.14	1.08	1.14
II	July	1.33	1.38	0.75	0.78

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## DISCUSSION

This study shows that the conduction of activities such as verification of infestation index and treatment of nursery spots without interruption leads to a decrease in the index of infestation and, consequently, in the register of cases of Dengue Fever. It should be stressed that the detected cases were autochthonous.

With the interruption of the cycles there was an increase in the incidence of dengue in the municipality. Reasons for discontinuity were the interruption of the job agreement and some delay in the engagement of new workers or in the selection process.

In TABLES 1,2 and 5 it is possible to see that the work of agents in a continuous cycle and with a great awareness of the community on the disease and control measures did not lead to the elimination of nursery spots, since during the interruption of the continuous cycles, when indexes were collected only in the strategic points (TABLES 3 and 4), the infestation returns to high values.

## CONCLUSIONS

There is a need for pertaining legislation to induce population to help in the control of mosquito nursery spots together with agents, aiming a stable reduction of the incidence rates.

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