Community Participation in Dengue Control in Brazil

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Abstract

This study aimed at reviewing recent studies about community participation in dengue control in Brazil. The results have shown that the information strategies have not determined effective behavioural changes in the community regarding the elimination of household mosquito breeding sites. This may be partially explained by qualitative studies that allow a deeper understanding of the influence of attitudes and beliefs on a person’s knowledge about mosquito control. These studies reveal the lack of intersectoral coordination between local and biomedical agencies dealing with health/disease and household sanitation, and highlight the difficulties in avoiding larval infestation in urban areas with poor water supply and sanitation services. The conclusions emphasize the importance of the knowledge about the daily problems faced by the communities affected and the search for partnership with the community in discussions and elaboration of proposals for dengue control. Investments in community sanitation, assuring appropriate water supply and regular household garbage and other solid-waste collection are important steps for successful dengue control measures.

Keywords: Dengue control, Aedes aegypti, community participation, Brazil.

Introduction

Dengue, an arboviral infection, has emerged a serious public health problem in several regions, such as South-East Asia, and Central and South America. Approximately two thirds of the world population lives in areas infested by Aedes aegypti, the major vector of the disease. This vector was eradicated from Brazil and other countries of the Americas in the early 1970s.\(^1,2\)

The reinfestation of the country by Ae. aegypti caused epidemics of dengue fever (DF) due to DENV-1 in the states of Roraima and Rio de Janeiro in the 1980s. From this period up to 2003, the disease spread throughout all Brazilian regions and caused more than 3 million cases. Dengue haemorrhagic fever (DHF) was first registered in 1990 and, up to 2003, resulted in 4654 cases and 260 deaths.\(^3,4,5,6\)

The virological surveillance carried out in the past 20 years in Brazil has shown that DENV-1 and DENV-2 have been circulating since 1986 and 1990, respectively. DENV-3 was isolated in 2001. Currently, all the four virus serotypes are in circulation in the Americas.\(^3,5,7\)

Among the factors associated with the emergence of DF/DHF in the Americas, urbanization and extensive movement of people among the countries clearly stand out as the most important. The rapid and haphazard urbanization affected the civic amenities, i.e. water supply, sanitary sewage
and garbage collection, resulting in the creation of numerous breeding sites for the vector. Approximately 20% of the population of big Latin American cities are estimated to live in such poor conditions.\cite{8,9,10}

In the absence of any specific treatment and vaccines for DF/DHF, vector control by source reduction using insecticides and larvicides is the only option.\cite{1,10,11} The ineffectiveness of spray applications against adults and the difficulties in the widespread use of larvicides in breeding sites have led to a reassessment of the control strategies.\cite{7,11,12} Approaches based on community participation and health education have been increasingly valued along with the felt need for epidemiological, entomological and viral surveillance.\cite{8,9,12,13}

**Methods**

This study reviewed research papers/reports published in the last ten years between 1995 and 2005 highlighting experiences with community participation in dengue control in Brazil with the aim of providing critical insights for such modifications to achieve success in dengue control programmes in the country.

The research papers were obtained from the Scielo Brasil (Scientific Electronic Library Online) databank by use of the following keywords: dengue, community participation and Brazil. Articles reporting community-based approaches in dengue control were included in this review. Each article’s content is briefly presented in the next section with emphasis on the strategies used for dengue control and the results obtained. A reflection about the experiences, comparing them between themselves and with the international literature, is presented in the last section of this paper.

**Results**

Nine articles reporting experiences in vector control in six Brazilian municipalities were reviewed and classified into two sets. The first set comprised of articles related to assessment of the impact of educational actions and scientific knowledge about dengue on community engagement in vector control actions. The second group comprised the articles that analysed the local understanding and practices in vogue for control of dengue, also to assess the impact of research inputs for the enhancement of preventive strategies and the effectiveness of participative actions in disease control.

**Case studies related to 1st objective**

1. One case study related to a household survey that assessed people’s knowledge about dengue and its vectors among housewives living in the municipality of São José de Rio Preto, in the state of São Paulo.\cite{14}

The results showed good knowledge about dengue – 84% of the interviewees knew the symptoms of the disease, 75% knew it was transmitted by a mosquito, and 86% identified water as the vector breeding site – although smaller numbers knew about the haemorrhagic form (26%). At this level of knowledge, the vector density in the households, measured by use of the Breteau index, was high.

2. Another study assessed the results of an educational action on dengue prevention carried out in the periphery of the same municipality.\cite{15} Surveys were applied to the housewives, and the potential breeding sites of the
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vector were counted before and after the educational action. The results showed that the educational action increased knowledge about dengue symptoms, transmission, vector characteristics and its breeding sites in a statistically significant manner. However, this gain did not correspond to a change in the habits of housewives, because the mean number of potential breeding sites in the households and the proportion of households with at least one breeding site remained constant. Statistical tests found no significant association between the knowledge about the ways to eliminate vector breeding and the presence of its breeding sites in the household.

(3) In the city of Santa Bárbara d'Oeste, in the state of São Paulo, a survey was carried out to assess the knowledge about dengue and the number of potential vector breeding sites in three areas with different levels of income, education and regularity in household water supply. Most of the community was familiar with dengue transmission and preventive measures through information provided on television, by vector control agents, and at school. In approximately 69% of the households, at least one type of vector breeding site was identified. In the downtown area, which had a better socioeconomic condition, a greater proportion of correct answers about the disease was observed. The number of potential breeding sites, however, was similar in the different areas.

(4) Another survey about community knowledge and practices regarding dengue was carried out in a suburban area of Brasília, in the Federal District. Knowledge about the disease, its vector, and control measures proved to be satisfactory. Most of the interviewees considered the elimination of household breeding sites by the community as the most effective preventive measure. However, in that study, the authors also reported a discrepancy between knowledge and effective vector control, because of the high level of breeding in household containers.

(5) In the city of Botucatu, in the state of São Paulo, a study was carried out with fifth and sixth graders of a public school divided into an intervention group and a control group to assess an educational method about dengue. The results showed statistically significant differences between the two groups regarding the knowledge about the vector, dengue transmission and its control measures. An impact on the households of the intervention-group students was observed: they had half the number of breeding sites as compared with those of the control group. The authors recommended the inclusion of that topic in school curricula.

Case studies related to 2nd objective

(1) Among the second group of studies, one study carried out in São José do Rio Preto had assessed a project of community participation in the implementation of vector control measures after one epidemic in the municipality in 1990. Public-school students and community associations were involved, a variety of educational material was elaborated, and mass media communication was used to spread information. Clean-up of
abandoned lots and improvements in water supply and household water reservoirs were performed by the municipal services with the aid of other intersectoral agencies. Commercial and industrial facilities and service providers were also targeted in the educational programme. One of the positive results the study reported was the reduction in the number of potential vector breeding sites in households, commercial facilities, cemeteries and construction sites, which the authors attributed to the use of different strategies and to the community mobilization, especially school-age children.

In the city of Catanduva, in the state of São Paulo, an investigation was carried out about the impact of dengue preventive actions, comparing two areas of the municipality with similar socioeconomic profiles.

Dengue control actions consisted of vector control and information dissemination to the community through municipal agents. Surveys were applied to a sample of households at the beginning and end of the investigation to assess the community knowledge and practices regarding dengue prevention, and to measure the vector-density index.

After the initial survey, a qualitative study was carried out with the application of semi-structured interviews to housewives aiming at in-depth understanding of their beliefs and practices related to dengue, considering their realities and daily difficulties.

The next step was the elaboration of the diagnosis of the situation, and, after discussion with the community, the definition and implementation of proposals of participative action. The following measures were taken: clean-up of abandoned lots and construction sites; implementation of cultural and educational activities; and recyclable garbage collection. In the control area, the municipal agents continued to take the routine actions.

At the end of the investigation, no significant differences were found between both areas regarding the knowledge about the vector control measures, which were satisfactory. In comparison with the control area, the following was observed in the area studied: a significant increase in the proportion of households with no potential breeding site; and a significant reduction in the mean number of breeding sites per household. The authors concluded that, in regard to vector control, if programme staff have a better understanding of local realities and discuss and implement preventive measures with the community, favourable and sustainable results are more likely to occur.

The results of the qualitative study showed that women associated dengue transmission with the presence of other mosquitoes and insects and not only with Ae. aegypti. Filth and garbage were their major environmental concerns, and their representation of the household was that of a healthy, clean environment unfavourable to mosquito and insect breeding. Caring about potential breeding sites was not a specific preventive practice, but was integrated into routine household clean-up. The women interviewed suggested ways
to improve the communication and information provided by health agents, and pointed out their preference for conducting their own preventive measures after receiving instructions.

The authors highlighted the major demand made by the interviewees, which was for health agents to play a different role – as a community facilitator rather than as a community controller. They also recommended that the content and format of the educational activities be reviewed with more emphasis given to community knowledge.

(4) As part of a project of community participation in dengue control in the Manguinhos slum complex in the city of Rio de Janeiro, a qualitative and quantitative study[22] was carried out to understand the beliefs and practices related to the disease in that sociocultural context and to improve the language and content of community-based educational activities.

Most of the interviewees, who were responsible for their households, knew about dengue transmission, and the commonest communication media were television, radio, and informal talks. However, an entomological survey revealed that the many preventive measures mentioned did not translate into effective behaviours. Their representations of garbage did not include potential breeding sites, such as containers, tyres, and drums, considered “useful utensils”. Another problem observed was the absence of covers on water reservoirs, common in urban slums, due to the lack of financial resources to acquire or replace damaged covers. Understanding the representations and behaviours of the community in regard to dengue and related to the socioeconomic and cultural organization of the group is, according to the authors, necessary for a participative project of disease prevention.

(5) A qualitative study was carried out in the municipality of Rio de Janeiro as part of a research project about the life and health conditions in the region of Leopoldina,[23] where a process of community mobilization took place due to the dengue epidemics that occurred in the municipality between 1986 and 1991. The householders reported that the results of their individual actions for dengue prevention were jeopardized by the discriminating approaches of the public sanitation policies, which favoured the wealthiest areas.

According to them, in the slums where 30% of the inhabitants of the region lived in 1991, the dengue epidemic could be related to the irregular water supply and garbage collection, which led the community to adopt measures for water collection and garbage disposal that created vector breeding sites. Study participants stressed the importance of exposing this reality. It did not appear in the information disseminated by the health agencies and media which instead incriminated householders’ behaviour as the cause of the dengue epidemic.

Discussion

The case studies reviewed indicated that the knowledge about dengue among different Brazilian communities was usually satisfactory;
However, that knowledge did not translate into effective dengue control actions resulting in any meaningful entomological impact. Similar observations have been made elsewhere by other international communities.\[12,24-29\]

Qualitative studies in Brazil have clearly brought out the relationship between community conceptions about dengue and the relationship between dengue control and local social and economic realities.\[30\] Two issues raised by those studies seem to explain, at least to some extent, the low levels of community adherence to preventive strategies: the dissonance between community and health agency conceptions about a healthy household, and the difficulties in avoiding larval infestation in household containers when faced by chronic community sanitation problems.\[31-33\]

The projections of health hazards are usually emphasized to be associated with dirty water or water contaminated with organic matter. Instructions communicated under sanitation and prevention of several infectious diseases, therefore, emphasize the need to keep domestic water supplies clean and to avoid contamination. Therefore, the idea that clean water reservoirs, mainly those located in the households, pose a hazard for dengue does not go well with the householders.\[23\] Cockroaches and rats associated with garbage and diseases that cause much more discomfort and trouble to the population at the periphery of big cities are more discernable than the Aedes mosquito.\[33\]

According to the present review, the most rewarding experiences were those where the community and its different social actors were effectively engaged in preventive programmes considering their socioeconomic structures.

On the other hand, it is also evident that community participation alone as an isolated alternative is not sufficient. Access to regular water supply and garbage collection services are integral for dengue control, although the provision of these services does not completely eliminate the mosquito breeding sites due to extraneous factors, viz. habits, preferences and economic characteristics.

The irregularity and lack of water supply is a major constraint faced by many communities, especially those located in the periphery of big cities. Although official data has shown an elevated proportion of households served by the public water supply system in our country, qualitative community studies have revealed a different reality. In underprivileged areas and slums, water supply is usually available only on certain days of the week, obliging the residents to store water in domestic containers,\[12,23,34\] which, as expected, are vulnerable to contamination by several bioagents, as well as to infestation by mosquito larvae. The cost of keeping the containers covered, particularly water tanks, is high, and for those living in such a situation of discomfort and improvisation, it does not seem a priority. Garbage collection is usually irregular or not performed at all in areas with more difficult access. The increase in the use of disposable containers for industrialized products contributes to the build-up of trash and mosquito breeding sites. Such containers are not usually considered garbage, but potentially useful objects maintained in the household, and almost always inadequately stored due to poor conditions.\[27\]

For achieving sustainable results for dengue control, interventions must fit the ground realities of daily life and must be based on a thorough understanding of community’s problems,\[33\] especially in settlements on the periphery of Brazil’s large cities. Likewise, far more investment must be made in the sector of sanitation and water supply services in such areas.\[36,37\] Controlling mosquito infestation in households and commercial and industrial areas requires action from all intersectoral agencies and not just...
the resident population.[12,28,29,31] Strengthening the bonds between communities and health services should be an ongoing effort, rather than reserved for dealing with dengue epidemics.

Through such ongoing partnerships, health agencies and communities can together decide upon and implement more feasible and effective measures for dengue prevention and control.

References


