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Perceptions on dengue among residents of a Brazilian border municipality

Percepções sobre dengue dos moradores de um município brasileiro de fronteira

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ABSTRACT

Background and Objectives: Approaches based on knowledge of the population constitute an important tool to guide the development of appropriate and effective strategies to control and prevent outbreaks of dengue. The objective of this study was to identify the perceptions about the knowledge, occurrence and control activities of dengue fever among the residents of Ponta Porã municipality, Mato Grosso do Sul state, Brazil/Paraguay border. **Method:** A qualitative-quantitative study was conducted from November to December 2016 in a population sample of residents in the urban area of the city. For the data collection, 383 residents were interviewed, whose content analysis was performed using the Collective Subject Discourse technique. **Results:** The speeches disclose coherence between the information disseminated by dengue control campaigns and the knowledge of the population about the disease. The population's own accountability for the occurrence of dengue was observed. The interviewees showed dissatisfaction with the dengue control actions developed by the municipal government, mainly regarding their intensity, regularity and continuity. **Conclusions:** Most of the interviewees know what dengue is, are aware of its form of transmission and know how its control is carried out.

KEYWORDS: Dengue. Disease prevention. Community participation. Border Areas.

RESUMO

Justificativa e Objetivos: As abordagens baseadas no saber da população se constituem em uma importante ferramenta para orientar o desenvolvimento de estratégias adequadas e efetivas para controlar e prevenir os surtos de dengue. O objetivo do estudo foi identificar as percepções sobre conhecimento, ocorrência e ações de controle da dengue dos moradores do município de Ponta Porã, no estado de Mato Grosso do Sul, fronteira Brasil/Paraguai. **Métodos:** Foi realizado um estudo quali-quantitativo no período de novembro a dezembro de

2016 em amostra populacional de residentes na área urbana do município. Para a coleta de dados foram entrevistados 383 moradores, cuja análise do conteúdo se fez pela técnica do Discurso do Sujeito Coletivo. **Resultados:** Os discursos revelam coerência entre as informações disseminadas pelas campanhas de controle da dengue e o conhecimento da população sobre a doença. Observou-se responsabilização da própria população pela ocorrência da dengue. Os entrevistados demonstraram insatisfação com as ações de controle da dengue desenvolvidas pelo poder público municipal, principalmente com a intensidade, regularidade e continuidade delas. **Conclusões:** A maioria dos entrevistados sabe o que é dengue, conhece sua forma de transmissão e como se dá o seu controle.

DESCRITORES: Dengue. Prevenção de doenças. Participação da comunidade. Áreas de fronteira.

INTRODUCTION

Considering that approximately three billion people are at risk of contracting the infection, dengue is now considered the world's most important vector-borne viral disease, with an estimated 390 million infections (96 million symptomatic ones) and 20,000 deaths reported annually.¹ In 2016, more than 2.38 million cases of the disease were reported in the American continent.² In Brazil, dengue fever has been occurring continuously since 1986, interspersed with epidemic outbreaks. Between 2010 and 2016, more than 7.5 million cases were reported, highlighting the recent epidemics of 2015 and 2016, with 1.6 and 1.5 million cases, respectively.³ Regarding the magnitude of the disease in Brazilian borders, between 2007 and 2009 dengue was among the diseases of compulsory notification, the second most significant one in these localities, second only to malaria.⁴

The actions aimed at fighting dengue are carried out in Brazil in accordance with the guidelines of the National Dengue Control Program (PNCD, *Programa Nacional de Controle da Dengue*), which has been operating since 2002.⁵ Among the municipalities considered to be priorities for the PNCD are those at Brazil's international borders, as they are considered receptive to the introduction of new disease serotypes. The program has ten components, comprising operational actions of integrated, entomological and environmental surveillance; patient care; health education, communication and social mobilization; training of professionals; social and political support and monitoring, and evaluation. However, the effectiveness of these interventions depends on the continuity, coverage and, above all, the adoption of preventive measures by the population. The population behavior regarding dengue prevention is influenced by individual and collective perceptions about the risk of the disease, mediated by the daily life experiences and by cultural elements.⁶ Thus, when one thinks about an intervention in health education, it is necessary to consider people's previous knowledge and perspective on the subject. Approaches based on the population's knowledge

constitute an important tool to guide the development of appropriate and effective strategies to control and prevent dengue outbreaks.⁷

Considering that in municipalities located on the borders the cultural practices, specific of each territory, are mixed with those used in the frontier territories, the propositions of educational interventions constitute a greater challenge in these localities. Because of these motivations and the frequent mobility of cross-border individuals, it is important to implement special surveillance and control strategies.

In this sense, the objective of this study was to identify people's perceptions about knowledge, occurrence of the disease and control actions related to dengue in a border town, by evaluating the municipality of Ponta Porã, state of Mato Grosso do Sul, Brazil, located on the border with Paraguay. This choice, for consideration purposes, was due to the direct contact of its territory with the international border and because it is a priority municipality for the Dengue Control Program in the state of Mato Grosso do Sul, Brazil.

METHODS

This is a quantitative, descriptive and exploratory study carried out from November to December 2016 in a population sample of residents in the urban area of the Ponta Porã municipality, located in the south of the state of Mato Grosso do Sul, on the border of Brazil and Paraguay.

The municipality, with has an area of 5,330,448 km², has an estimated population of 88,164 inhabitants, 80% of which reside in the urban area.⁸ The city of Ponta Porã is separated by a street (the International Avenue) from the city of Pedro Juan Caballero (the capital of the Amambay department), in Paraguay.

In order to calculate the sample size, we considered for the urban population of Ponta Porã, a 50% incidence of dengue, a sampling error of 5% and a 95% confidence interval, resulting in a minimum sample of 383 participants. This total was distributed proportionally to the registered population in each of the five census sectors of the municipality used by the Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística* - IBGE).

The systematic sampling technique was used, by dividing the number of households of each sector by the number of sample subjects of each sector, and the value obtained was considered the interval between the households. A draw was made between the number 1 and the interval value obtained in each sector, to establish the casual start of household sampling, in order to maintain the randomness.

Two interviewers, previously trained on the subject, carried out the interviews in the selected households, using a semi-structured script consisting of two parts: the first addressing questions about the residents' profile (age, gender and schooling) and the second with guiding questions (highlighted, in the Results section, as the title of the tables), which addressed the knowledge about dengue, the practice and habits of prevention and the evaluation of the control actions developed by the government. For the guiding questions, more than one answer was admitted per interviewee. Only one person was interviewed in each household. The inclusion criteria were: age ≥ 18 years, of both genders, and agreement to participate in the study. The mean duration of the interview was fifteen minutes. The interviews were fully recorded, as a strategy to put the interviewees more at ease to answer them and to speed up the data collection, and the interviews were fully transcribed for subsequent analysis.

The Discourse of the Collective Subject (DCS) technique was used to assess the collected data, which is a proposal for the organization and tabulation of qualitative verbal data obtained from statements.⁹ The basic methodological procedure requires the identification of the central ideas (CI) in the interviewees' discourses about the established question. The interviewees' discourses may contain one or more CI. For each established CI, key expressions are assigned, so that it becomes possible to group the key expressions of similar meaning into categories of responses. Synthesis-discourses are then constructed using the material of the CI key expressions, in the first person singular, which are the DCS.⁹

The analysis of the discourses was performed using the DSCsoft software (improved version of Qualiquantisoft), developed at the School of Public Health of the University of São Paulo (USP) by Lefèvre and Lefèvre in partnership with Sales & Paschoal Informática.¹⁰

The research was approved by the Ethics Committee linked to the Federal University of Mato Grosso do Sul, under Protocol number 1,804,168, in compliance with the Research Guidelines and Norms established by Resolution n. 466/12 of the National Health Council.

RESULTS AND DISCUSSION

Of the 383 assessed individuals, 62% were aged between 18 and 44 years, and most of them were women (62.9%). This profile of respondents has also been found in other studies on the population's knowledge about dengue.^{11,12} Regarding education, 51.4% of the interviewees had more than Elementary School level, and 17 individuals were illiterate.

The results of the survey applied to the interviewees will show their central ideas and the proportion obtained for each of these CI presented as tables. The most frequently shared CI for each formulated question, that is, the one with the greatest intensity and high

amplitude, will be presented as DCS. However, the discussion refers to all the obtained discourses.

Table 1 shows the six CI created for question 1: “What is dengue for you?” and the proportion obtained for each of them. The interviewees showed they knew what dengue was. Most of them recognize dengue, in a simple or qualified manner, as a disease (74.8%). Those who qualify the disease, associate it with its vector, (prevalent CI), i.e., the *Aedes aegypti* mosquito; and associate dengue to the sensation it causes, the effects on the body and/or the fear of its fatality; and with the lack of care.

Table 1 – Distribution of the central ideas based on the answers to question 1: “What is dengue for you?”, Ponta Porã, 2016.

Central Ideas	Frequency	%
A - Dengue is a disease transmitted by a mosquito	107	28.0
B – It is a serious, dangerous disease and it can kill	100	26.2
C – It is a mosquito	91	23.8
D – It is a disease	41	10.7
E - It is a disease caused by lack of care with the environment in which one lives	38	9.9
F – I do not know	12	3.1

“. DCS A: Dengue is a disease transmitted by a mosquito”

Dengue is a disease transmitted by a mosquito, that special type of mosquito. It is transmitted through the bite of the Aedes aegypti mosquito. The mosquito bites the person and the person becomes sick. It is transmitted by the bite of the female mosquito, and its agent is a virus.

It should be noted that in 2016, Ponta Porã went through an epidemic of dengue, with an incidence of 3403.1 cases/100,000 inhabitants and eight confirmed deaths, which corresponded to 42% of all occurrences in Mato Grosso do Sul.¹³ It is possible that most interviewees who associated dengue with a serious, dangerous and potentially fatal disease had their answers influenced by a recent experience with the disease, since this study was carried out shortly after the epidemic peak. Experiences with the disease can increase the population's perception of the risk and, consequently, promote prevention actions.¹⁴

Another obtained CI that deserves attention is the “C” option: *It is a mosquito*. Here, it

is noteworthy that when defining the disease, the interviewees mistook the disease (dengue) for its vector. This social imaginary is one of the undesirable effects of the overly synthetic educational messages issued by health authorities, where the dengue issue is reduced almost exclusively to the control of the mosquito population, disregarding the sociocultural determinations involved in the process.¹⁵

Only a very small percentage of the group (3.1%) did not know what dengue was. This finding may reflect the profile of the interviewed population, where 38.7% had not finished Elementary School and 4.4% were illiterate. This perspective, to a certain extent, shows that the messages of educational campaigns are not being understood by part of the population.

Table 2 shows the central ideas regarding the respondents' attitudes regarding what they have done to prevent the occurrence of dengue.

Table 2 – Distribution of the central ideas based on the answers to question 2: “What have you done to prevent the occurrence of dengue?”, Ponta Porã, 2016.

Central Ideas	Frequency	%
A – I empty containers that hold stagnant water	266	69.6
B - House and backyard cleaning	204	53.4
C – Careful with potted plants	49	12.8
D - Use of insect repellent	15	3.9
E - Use of insecticide	14	3.7

“ DCS A: I empty containers that hold stagnant water”

We must be careful of containers that hold stagnant water, right? Especially that. I empty anything that might collect stagnant water. I do not leave pots, cans, plastic containers around that can collect water... I take care of everything! I empty all of them. If it drizzles a little, I go out to see if there is a bucket or a container that has been filled up with water. I put the bottles upside down, I do not let water accumulate. I wash the dogs' pots and fill them with clean water. We must not allow stagnant water collection under any circumstances!

The three CI that were most often shared among the interviewees regarding this question, associated dengue prevention with vector control. It is possible that the explanation for this attitude is the same as in the previous question, when the population mistook the disease for

its vector: educational campaigns focused on the control of the vector breeding sites. According to the common sense, preventing the disease is understood as eliminating the mosquito.¹⁶

An analysis of the content of printed materials on dengue showed that most of them (88%) focused on the physical control, by dealing with the containers or possible breeding sites.¹⁷ According to the authors, this transfer of information that is simply of biological nature, contributes to a reductionist view of the disease by the population, in which the breeding sites determine the presence of the vector, which, in turn, determines the occurrence of the disease.

It can be observed that only 3.9% of respondents' answers mention the repellent as a way to prevent dengue. It should be noted that materials used in the campaigns contain scarce information on individual and household protection against mosquito bites. Collective socio-environmental measures should always be intensified and supplemented by individual protection measures. Therefore, we highlight the need to instruct the population about such procedures.

The population's perception regarding the occurrence of dengue in Ponta Porã allowed the disclosure of seven Central Ideas (Table 3).

Table 3 – Distribution of the central ideas based on the answers to question 3: “In your opinion, why is there dengue in your municipality?”, Ponta Porã, 2016.

Central Ideas	Frequency	%
A – Because of the population's lack of care with the environment where they live	254	66.5
B - Because of the government's inefficiency and negligence	78	20.4
C - Because the neighbor does not do his part	33	8.6
D – I do not know	18	4.7
E – It is Paraguay's fault	16	4.2
F – Because people do not believe in the disease or its severity	9	2.4
G – Because of the weather	9	2.4

“DCS A: Because of the population’s lack of care with the environment where they live.”

It's because people don't care, right? They are very messy. People don't take care of their own homes; don't take care of their own backyards, leave stagnant water around and even throw garbage in each other's backyards, too. Leaving everything at the hands of the government. It is very convenient. Many people know how to prevent the disease, but they do not put it into practice. Everyone has to do their part.

Considering the different ideas about the occurrence of dengue in Ponta Porã, it can be observed that the population recognizes their own negligence regarding the fight against the disease. Aspects such as lack of care with the environment surrounding the households, self-indulgence, lack of commitment and not corresponding to the educational messages are crucial for the interviewees’ understanding to judge the persistence of the disease.

DCS “A” demonstrates the duality of the knowing what to do and not doing it. Disregard of the environment where they live is attributed by the interviewees not to lack of knowledge of the preventive measures or consequences of the disease, but the lack of the population’s commitment regarding the fight against the disease. Having the knowledge does not necessarily results in preventive behavior.¹⁸

One of the factors that can be identified as responsible for the lack of effective commitment by the population are the dengue vector control actions carried out vertically, with the municipality being in charge of reproducing the practices prescribed in the official manuals.¹⁶ Local knowledge and practices are not incorporated into the control strategies, that is, the specificities of each locality are not considered when planning the activities, a situation that has specific delineations in border areas.

Border cities somehow naturally integrate and create a type of a third space, which generates a new society, with their own cultural and ethnic values and traits, particular and specific languages of that locality, presenting a different identity from that of the rest of the country.¹⁹ Knowing and taking into account the specificities of these regions is important to support the discussion and formulation of the most adequate dengue prevention and control actions and, consequently, to stimulate the population’s participation in vector control.

The second most shared CI among the studied population associates the occurrence of dengue in Ponta Porã with the inefficiency and negligence of the government (20.4% of the answers). The garbage in the city, the insufficient cleaning of the streets and vacant lots and

the carelessness with the public spaces were identified as failures regarding the City Hall actions.

The fight against the *Aedes aegypti* is related to the care directed to the urban environment and it is everyone's responsibility, including the population and the government, not only of the health area. Research shows that, even under optimal vector control conditions, transmission can be reinstated if the participation of the whole community, from the decision makers to the affected population, fails.²⁰

There is a tendency, which is no less important, to blame the "other", manifested through the idea that it is the neighbor's and Paraguay's fault, as shown by CI "C" and "E". This transfer of responsibility has also been identified in another study.²¹ The interviewed population tends to reproduce what Valla considers to be one of the most harmful effects of the inefficiency of public services in Brazil: the blaming of the victim.²² According to the author, the government individualizes the question of fighting the vector by directly blaming the mosquito that transmits the disease and, indirectly, the population for the occurrence of the disease. In border areas, the international neighborhood is another element that can be blamed by the population and the government for the failure to control the disease.

When asked if they are satisfied with the dengue control actions carried out by municipal government, the variables Yes (49.6%) and No (47.9%) are practically equivalent in the respondents' answers, although the most prevalent CI is negative regarding those actions (34.3%) (Table 4).

Table 4 – Distribution of the central ideas based on the answers to question 4: "Are you satisfied with the dengue control actions developed by the municipal government? Why?", Ponta Porã, 2016.

Central Ideas	Frequency	%
A - No. Because they still have to improve the control and prevention actions	131	34.3
B - Yes. The population must contribute more	67	17.5
C - Yes. Because of the educational actions and the control agents' work	61	15.9
D - Yes. Because they are doing their part	50	13.1
E - No. Because the actions are sporadic	27	7.1
F - No. Because the control actions are not performed or are inefficient	18	4.7

G – More or less. More actions should be performed	14	3.7
H - Yes. Because there are no cases of the disease in the neighborhood or in the town	12	3.1
I – Did not know how to answer	9	2.4
J - No. Because there is a scarcity of health workers	7	1.8

“DCS A: No. No. Because they still have to improve the control and prevention actions.”

No. Because it's not as good as we expected. I think it is necessary to do more. They are doing only 20% of what they have to do. There should be more people going into the houses, taking care of things, looking, advising. Agents have to go more often into the houses; give people inform more information. We need to invest more in advice and publicity campaigns in all neighborhoods and not only in some of them. I think it could be better. Instruct the population more often to clean their lots. Very little is being done.

In general, the several CI presented by the population demonstrated that they recognize that an effort to fight the disease is being carried out by the government. However, it is evident they are not satisfied with the intensity, regularity and continuity of this work. In this sense, we can see the dissatisfaction with the seasonal campaigns and the understanding that the risk of contracting the disease occurs all year long.

In Brazil, health education for dengue prevention remains seasonal, sporadic and discontinuous. This fact does not favor the adoption of prevention behaviors, as it establishes a rupture in the continuous communication between health professionals and the community.²³

The seasonal silence is a challenge to be overcome. It is important to highlight the importance of the Family Health Strategy, especially the figure of the Community Health Agent, regarding the work that must be carried out continuously related to the dengue problem. Adequate intervention at times of low transmission can help to keep the mosquito infestation below a critical threshold during periods of high transmission.²⁴

Another important aspect was valuing the technical and educational work of dengue control agents, as shown in CI “C”, similar to that recorded in another study on the users’ perception of basic care on dengue.²⁵

Even without the continuity desired by the population, the actions of these agents have positive impacts that remain in the (un)conscious of the local residents. These are sporadic actions, but with high visibility and produce instant results.

The evaluation of the studied population’s degree of satisfaction with the dengue control actions developed by the municipal government constitutes an important indicator to be considered in the planning of actions.

Based on the analysis of the DCS of the interviewees, it is possible to conclude that the majority knows what dengue is, is aware of its form of transmission and how the control is performed. However, one can perceive a reproduction of the popular TV campaigns, of which background aims to frighten, to blame and to place the responsibility on the population.

The interviewees recognized their own negligence regarding the fight against dengue as the main motivation for its occurrence, without disregarding the government’s inefficiency and negligence. They showed dissatisfaction with the dengue control actions developed by the municipal government, mainly regarding the intensity, regularity and continuity of these actions.

The results suggest the need for adjustments in the communication, education and social mobilization practices. It is necessary to establish a dialogue, using appropriate techniques and languages, so that the population can receive reliable information that makes sense for their reality. It is necessary to set aside the episodic information campaigns, to promote training ones. Considering that is a frontier municipality, where cultural hybridization is a reality, it is extremely important that the agents assigned to implement such practices know and consider the values and beliefs of this border population.

Finally, communication, education and social mobilization practices must be associated to a set of intersectoral actions. Improvements in urban infrastructure can reduce the risk of dengue.

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