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# Epidemiological evaluation of accidents with poisonous animals in West of Bahia

Evaluación epidemiológica de accidentes con animales venenosos en Bahia Occidental

Avaliação epidemiológica de acidentes com animais peçonhentos no Oeste da Bahia

## ABSTRACT

**Introduction:** In Brazil, the number of accidents involving venomous animals is increasing and the main cause of this scenario is the ecological imbalance caused generally by human actions, which constitutes a worrying picture of public and epidemiological health. **Aim:** To present quantitatively the accident rates caused by venomous animals registered in the cities of Barreiras - BA. **Method:** This article is a qualitative and quantitative field research. **Result:** The Rural Zone had the highest rate of notifications, totaling 58 notifications in the two years, 34 in 2018 and 24 in 2019, among animals, the scorpion is the one with the highest record of accidents. **Conclusion:** The rates of accidents by venomous animals in cities are still a worrying scenario, presenting a risk to the health of the region's population. These accidents remain a serious public health problem in Brazil.

**DESCRIPTORS:** Accidents; Venomous animals; Collective Health.

## RESUMEN

**Introducción:** En Brasil, el número de accidentes con animales venenosos está aumentando y la principal causa de este escenario es el desequilibrio ecológico provocado en general por la acción humana, lo que constituye un cuadro preocupante de salud pública y epidemiológica. **Objetivo:** Presentar cuantitativamente los índices de siniestralidad por animales venenosos registrados en las ciudades de Barreiras - BA. **Método:** Este artículo es una investigación de campo cualitativa y cuantitativa. **Resultado:** La Zona Rural tuvo la mayor tasa de notificaciones, totalizando 58 notificaciones en los dos años, 34 en 2018 y 24 en 2019, entre los animales, el escorpión es el que tiene mayor récord de accidentes. **Conclusión:** Las tasas de accidentes por animales venenosos en las ciudades siguen siendo un escenario preocupante, presentando un riesgo para la salud de la población de la región. Estos accidentes continúan constituyendo un grave problema de salud pública en Brasil.

**DESCRIPTORES:** Accidentes; Animales venenosos; Salud pública.

## RESUMO

**Introdução:** No Brasil é crescente o número de acidentes por animais peçonhentos e a principal causa desse cenário é o desequilíbrio ecológico ocasionado geralmente por ações humanas, o que configura um preocupante quadro de saúde pública e epidemiológico. **Objetivo:** Apresentar quantitativamente os índices de acidentes ocasionados por animais peçonhentos registrados nas localidades do município de Barreiras - BA. **Método:** O presente artigo é uma pesquisa de campo de caráter quali-quantitativo. **Resultado:** A Zona Rural apresentou maior índice de notificações, somando 58 notificações nos dois anos, 34 em 2018 e 24 em 2019, dentre os animais, o escorpião é o que apresenta o maior registro de acidentes. **Conclusão:** Os índices de acidentes por animais peçonhentos nas cidades ainda configuram um preocupante cenário, apresentando risco à saúde da população da região. Esses acidentes continuam a constituir um sério problema de saúde pública no Brasil.

**DESCRIPTORES:** Acidentes; Animais Peçonhentos; Saúde Coletiva.

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## **INTRODUCTION**

**A** “venomous animal” is anyone who has paracnemid glands and structures that enable the venom, a poisonous substance, to be injected into humans. In which can be pointed out: bees, spiders, scorpions, frogs and some specimens of snakes.<sup>1</sup> Hospital events related to venomous animals are more prevalent in inland cities and rural areas in poor and developing nations, as well as in Africa, Latin America, Asia and Oceania, affecting mainly rural workers and children.<sup>2</sup>

Among these animals, some stand out for having a high degree of poisoning such as the Armadeira spider of the genus *Phoneutria*, Viúva, the Black spider of the genus *Latrodectus* and the Brown spider of *Loxosceles*; Snakes also have great relevance, classifying the Rattlesnake of the genus *Crotalus*, the True Coral of the *Micrurus*, Jararaca of Bothrops and the Surucucu of the genus *Lachesis*; Scorpions of the genus *Tityus* and Caterpillars of the genus *Lonomia*; and, African Bees, considered dangerous due to their aggressiveness.<sup>3</sup>

In this context, in the years 2010 to 2014, the Notifiable Disease Information System - SINAN, reported 691.307 cases of accidents by venomous animals in Brazil, of which 1.282 occurred after death. What led the Ministry of Health to include snakebites on the list of tropical diseases neglected by the World Health Organization.<sup>4</sup> Such data is of fundamental importance to promote surveillance actions, improvement in public health and adoption of measures to clarify the population and other accident prevention policies for venomous animals, with emphasis on the local reality and interventions necessary to reduce these injuries.<sup>5</sup>

Therefore, this work aims to present the data provided by the Epidemiology Se-

cretariat of the city of Barreiras - Bahia, in order to present quantitatively the accident rates caused by venomous animals registered in the localities of the municipality and the specimens of greater occurrence in the years 2018 and 2019. Therefore, the problems that guide this work are summarized in three questions: what is the index of venomous animals in Barreiras? What is the number of deaths generated? and which are the main causative agents of the accidents.

**A “venomous animal” is anyone who has paracnemid glands and structures that enable the venom, a poisonous substance, to be injected into humans.**

## **METHOD**

The present study is a qualitative and quantitative field research, where a survey

of epidemiological data on cases of accidents by venomous animals was carried out in 2018 and 2019 in the municipality of Barreiras, located in western Bahia, Brazil. These data were obtained through a visit to the Secretariat of Epidemiology of Barreiras - BA, as well as the data tabulated and made available by SINAN (Information System and Notifiable Diseases) and by DATASUS (Database of the Unified Health System), the results were tabulated and treated in a quantitative way, organized in tables and graphs using the EXCEL 2010 software and submitted to descriptive analysis. Having a qualitative approach due to its characteristic of presenting a theoretical overview of the specimens analyzed in the statistical data and the epidemiological picture of the region, in order to include and discuss hypotheses inherent to what is presented quantitatively. The inclusion criteria selected for this study were: data obtained from data collection at the Department of Health and at the governmental sites SINAN and DATASUS, data referring to Brazil, with an emphasis on Barreiras BA, and data published in 2019. In parallel the exclusion criterion raised was: data that did not respond to the issues raised.

## **RESULTS and DISCUSSION**

Annually thousands of cases of accidents by venomous animals occur, being an important public health problem in tropical regions of the world. And despite the high morbidity resulting from accidents with venomous animals in Brazil, this topic does not receive as much attention in the academic environment and in the curricula of medical, biology and similar courses in the country.<sup>6,7</sup>

Especially in municipalities in the interior of Brazil, accidents with venomous

animals are a public health problem, so updated regional information is important for the development of epidemiological surveillance actions. Since, in many cases, there is the possibility of generating sequelae that cause temporary or permanent disability, and even the death of the victims.<sup>5</sup>

According to DATASUS, Brazil presented a total of 265.701 cases of accidents by venomous animals in 2019. Among its notification regions, the Southeast region presented the largest number of cases with a total of 99.234, followed by the Northeast region with 94.615 a total of cases. The region with the lowest number of acci-

dents was the Midwest, with 16.573 cases. Among these patients, 438 deaths were reported in the country due to the notified disease.<sup>8</sup>

The state of Bahia has the highest number of accidents reported by venomous animals in the Northeast region in 2019, with a total of 24.687 cases, being the second state with the highest notification of deaths: 47 in total<sup>9</sup>. In this context, in the city of Barreiras, in 2019, a total of 142 cases were notified by the Secretariat of Epidemiology, which occurred both in the rural and urban areas.

In the municipality of Barreiras, the Ur-

ban Zone has a much higher number than in the Rural Zone, in Figure 1 it is possible to observe that from 2018 to 2019 there was a considerable reduction in notifications, with the Urban Zone from one year to the next. presented a reduction of more than half of the cases (31%), as well as the rural area that presents a reduction of 97%.

The population's lack of knowledge about performing first aid at the time of the accident is an important factor in increasing the death rate for venomous animals, as the procedures prevent the patient from progressing more quickly to a severe stage.<sup>10</sup> In addition, it is extremely important that the victim's companion knows characteristics about the species that caused the accident, so that health professionals know what type of animal they are dealing with and offer the appropriate treatment and with the greatest possible agility.<sup>11</sup>

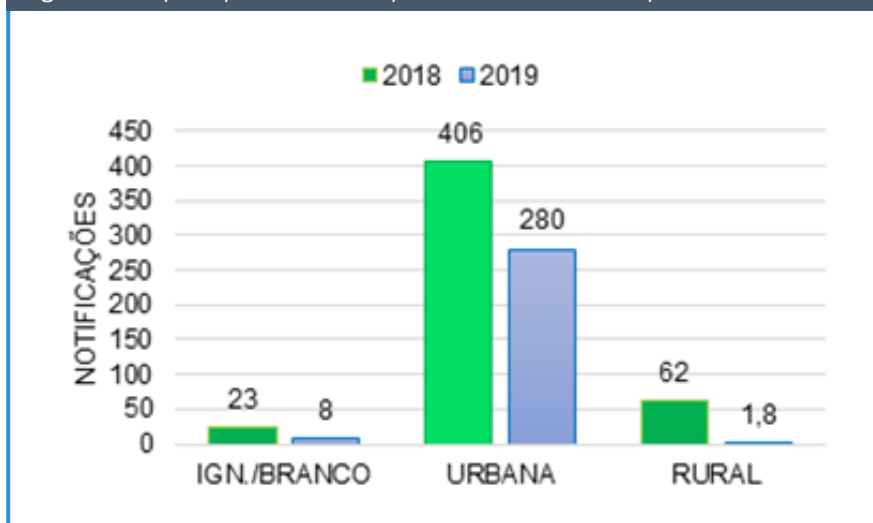
Among the accident rates presented, the scorpion is the species with the highest record of accidents, as can be better seen in Figure 2. What can be explained by taking into consideration that these are common animals of the fauna of the Brazilian Northeast region.

As regiões Norte e Nordeste são as principais responsáveis pela elevada riqueza de espécies de escorpiões do Brasil, são 34 espécies registradas só para a região Nordeste, o que representa 26% da fauna de escorpiões brasileiros, e embora muitas espécies sejam sendo ameaçadas de extinção, muitas se adaptaram às condições ambientais e ao crescimento populacional.<sup>12</sup>

In Brazil, scorpions that cause serious accidents belong only to the genus *Tityus* (Family Buthidae), commonly found in the city of Barreiras (*Tityus serrulatus*, *Tityus bahiensis*, *Tityus stigmurus*), since this specimen has the ability to adapt to environments that have been modified by humans, being able to live in debris and garbage accumulated inside residences, cemeteries or abandoned land since in these places you can find food and shelter.<sup>12, 13</sup>

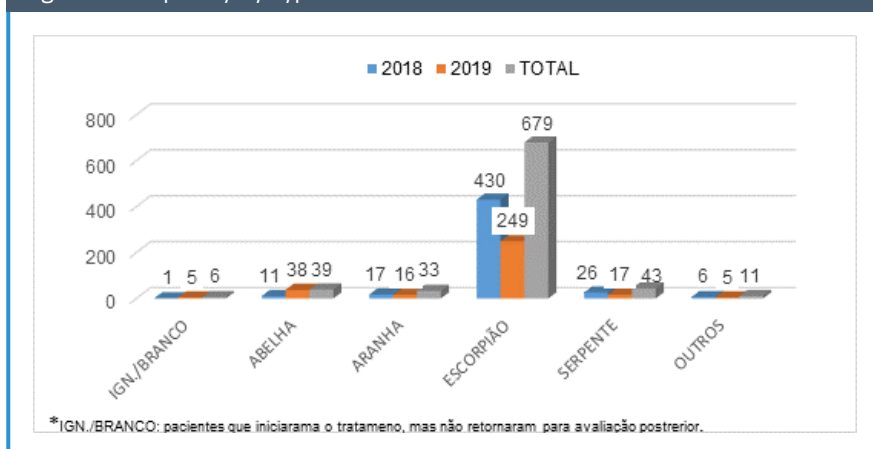
The species of medical importance that cause serious or fatal poisonings are *T. bahiensis*, *T. obscurus*, *T. serrulatus* and *T. stigmurus*. Its effective adaptation to mo-

Figure 1. Frequency of accidents by residential area in the years 2018-2019.



Source: Secretariat of Epidemiology of Barreiras - BA. Edition: The authors.

Figure 2. Frequency by Type of Accidents in Years 2018 - 2019



Source: Secretariat of epidemiology of Barreiras - BA. Graphic edition: The authors.

dern life was due to the destruction of its natural habitat with the expansion of cities, which demands as a main conservation measure the protection of the environments in which these animals occur, which would probably help to maintain the installed populations and the other species that live in those areas.<sup>12</sup>

Even though antiscorpionic serum and intensive care medicine are increasingly updated, scorpion bite poisoning is still responsible for high rates of lethal cases in Brazil. These accidents usually happen mainly during the hot and rainy months, with a fatality rate of 0,58%.<sup>14</sup>

Snakes also represent a high number of accidents in the city of Barreiras (Figure 3). The cerrado region is a natural habitat for more than 100 different species of snakes, which can be venomous, capable of posing a risk to humans, or not having poison and thus offering less risk of causing accidents to humans.<sup>11</sup> Accidents with snakes are divided into four types: botropic accidents, which occur with snakes of the genera *Bothrops* and *Bothrocophias* – jararaca, jararacuçu, urutu, caçaca and comboia; crotalic accidents, with snakes of the genus *Crotalus* - rattlesnake; laquetic accidents with snakes of the genus *Lachesis* – surucucu-

-pico-de-jaca; and, elapidic accidents, with snakes of the genus *Micrurus* and *Leptomicrurus* – true coral.<sup>11</sup>

In this context, in Barreiras, the genus *Botrópico*, whose main representative is Jararaca, is the cause of the highest number of accidents in the city, with between the years 2018 and 2019 there was only a 31% reduction in cases. In the data presented, another index that draws a lot of attention is that of patients who did not return for an evaluation subsequent to the start of treatment, which does not allow a better evaluation of the consequences of accidents. Across the country, the number of accidents by snakes and other venomous animals grows exponentially, including in large capitals, and the main cause is the ecological imbalance caused by deforestation and climate changes that have occurred over the years. However, the real magnitude of the epidemiological data is still inconsistent in Brazil due to the large number of underreporting.<sup>15</sup>

Accidents are not always correctly reported by health units, considering the fact that the population generally adheres to empirical practices for treatment, which results in the delay in seeking medical care.<sup>16</sup>

This scenario justifies the recommendation to develop active case search strategies

in addition to promoting activities that raise awareness of the importance of notifications to the bodies responsible for balancing the data. Thus, the training of health professionals in zoological classification and conditions favorable to specimens with lethal capacity for poisoning is essential.<sup>17,18</sup>

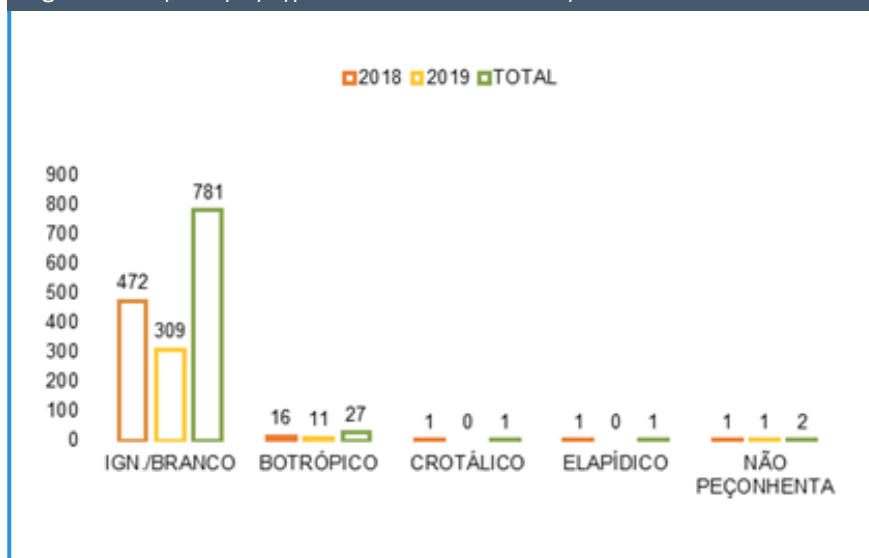
The correct notification of serious and snakebite accidents would show the best distribution of anti-snakebite sera, in the quantity and type of serum to be produced and distributed to the localities, in the geographical distribution data of venomous animals and in the epidemiological and clinical data of the accidents that occurred, and consequently it would qualify the planning of preventive actions.<sup>17</sup> It is essential to strengthen epidemiological surveillance, and to promote basically health education actions, always with the objective of reducing their morbidity and mortality.<sup>19</sup>

Thus, the guidelines recommended by the WHO are for the individual to remain calm, going to the emergency room closest to the accident site and trying to pay attention to the animal's characteristics and, if possible, registering a photo of it.<sup>20</sup>

## CONCLUSION

The accident rates for venomous animals in the cities still represent a worrying scenario, presenting a risk to health. The present study corroborates with the literature reiterating that the biggest cause of accidents by venomous animals remains the scorpion followed by the snake. And the species predominating in the region are: *Tityus serrulatus*, *Tityus bahiensis*, *Tityus stigmurus* scorpions and *Botrópico* genus, whose main representative is Jararaca. Many of the accidents that occurred evolved to death, since in Brazil in 2019, 438 deaths from accidents involving venomous animals were reported, and in the state of Bahia, 47 fatal cases were recorded. Given the dangerousness of not adequately treating victims of accidents by venomous animals, awareness measures are an effective alternative to be applied in

Figure 3. Frequency by type of snake between the years 2018 - 2019.



Source: Secretariat of epidemiology of Barreiras - BA. Graphic edition: The authors.

the city, in addition to training health professionals in the epidemiology and clinical

occurrence of these poisonous specimens, as well as in the correct processing of noti-

fications to public health and epidemiological control bodies. ■

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