

Analysis of the epidemiological profile of accidents by venomous animals in Brazil between 2010 and 2019

Análise do perfil epidemiológico de acidentes por animais peçonhentos no Brasil entre 2010 e 2019

Análisis del perfil epidemiológico de los accidentes por animales venenosos en Brasil entre 2010 y 2019

RESUMO

Objetivo: Descrever o perfil epidemiológico dos acidentes com animais peçonhentos no Brasil, entre 2010 e 2019. Métodos: Estudo descritivo, quantitativo e de caráter epidemiológico com consulta a dados secundários disponibilizados no DATASUS, utilizando dados sobre o número de casos notificados, sexo, região, faixa etária, escolaridade e evolução clínica. Resultados: Foram notificados 1.844.384 casos, onde a região com maior prevalência no ano de 2019 e a região com mais registros é a Sudeste com 670.480 (36,35%). Indivíduos entre 20 e 39 anos (33,01%) foram os mais afetados, já para a escolaridade aqueles que não completaram da 5ª a 8ª série do ensino fundamental eram os mais prevalentes. A maioria dos pacientes notificados evoluíram para a cura. Conclusão: Torna-se evidente a importância de medidas intersectoriais entre vigilância epidemiológica e políticas informativas na contenção de acidentes causados por animais peçonhentos.

DESCRIPTORIOS: Animais peçonhentos; Acidentes; Epidemiologia.

ABSTRACT

Objective: To describe the epidemiological profile of accidents with venomous animals in Brazil, between 2010 and 2019. Methods: Descriptive, quantitative and epidemiological study with consultation of secondary data available in DATASUS, using data on the number of reported cases, sex, region, age group, education and clinical course. Results: 1,844,384 cases were reported, where the region with the highest prevalence in 2019 and the region with the most records is the Southeast with 670,480 (36.35%). Individuals between 20 and 39 years old (33.01%) were the most affected, as for schooling, those who did not complete the 5th to 8th grade of elementary school were the most prevalent. Most of the reported patients progressed to cure. Conclusion: The importance of intersectoral measures between epidemiological surveillance and information policies in the containment of accidents caused by venomous animals becomes evident.

DESCRIPTORS: Venomous animals; accidents; Epidemiology.

RESUMEN

Objetivo: Describir el perfil epidemiológico de los accidentes con animales venenosos en Brasil, entre 2010 y 2019. Métodos: Estudio descriptivo, cuantitativo y epidemiológico con consulta de datos secundarios disponibles en DATASUS, utilizando datos sobre el número de casos notificados, sexo, región, grupo de edad, educación y curso clínico. Resultados: Se reportaron 1.844.384 casos, donde la región con mayor prevalencia en el 2019 y la región con más registros es la Sudeste con 670.480 (36,35%). Los individuos de 20 a 39 años (33,01%) fueron los más afectados, en cuanto a la escolaridad, los que no completaron el 5º a 8º grado de la enseñanza fundamental fueron los más prevalentes. La mayoría de los pacientes informados progresaron hasta curarse. Conclusión: Se hace evidente la importancia de las medidas intersectoriales entre la vigilancia epidemiológica y las políticas de información en la contención de los accidentes causados por animales ponzoñosos.

DESCRIPTORES: Animales venenosos; accidentes; Epidemiología.

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INTRODUCTION

Accidents by venomous animals constitute a public health problem and are included in the list of Neglected Tropical Diseases of the World Health Orga-

nization (WHO). In Brazil, due to their high occurrence, they were included by the Disease Notification System (SINAN) as cases of compulsory notification, that is, accidents must be reported immediately to the Ministry of Health.

^{1,2,3,4}

The realization of works that address the physical and socioeconomic impacts due to the occurrence are usually scarce in several areas of the country, which ends up complicating the measures of

surveillance and assistance to patients, even more so in rural, indigenous or unusually exposed to risks.³

Snakes of the family Viperidae and Elapidae, scorpions of the genus *Tityus* and spiders of the genus *Loxosceles*, *Phonetreria* and *Latrodectus* are the ones with the greatest medical importance in the Brazilian territory. These animals are capable of inoculating the venom (poison) into other living beings through adapted anatomical structures such as teeth and stingers, causing accidents that disable and can lead to death if not treated in a timely manner.^{4,5}

Most cases occur in rural areas due to occupational and cultural activities, but an increase has also been observed in metropolitan city areas, since factors such as the lack of planning of urban expansion, ecological imbalances and environmental changes, favor this scenario.^{5,6}

Signs and symptoms range from local clinical manifestations such as pain and swelling to systemic manifestations such as fever, chills, and hemorrhage. In addition, depending on the type of toxin, the amount injected into the victim and the interval between the accident and care, more intense tissue damage such as necrosis and, in more severe cases, amputation of the affected limb can occur.^{7,8,9,10,11}

When we consider scorpions, the most reported species belonging to the genus *Tityus* with emphasis in *Tityus serrulatus*, *T. bahienses* and *T. stigmurus* due to its wide territorial distribution and rapid adaptation to the urban environment. Spiders, on the other hand, are among the most frequent compulsory notifications in Brazil, considering the medical importance for the genera *Loxosceles* (Brown spider), *Phonetreria* (trapper spider) and *Latrodectus* (Black widow). These arachnids had a good adaptation to the urban and periurban environment, thus explaining the high numbers of accidents in cities in the country.⁹

The wide variety of clinical effects represent a challenge to treatment, as

they include local, general and systemic effects such as: pain, including headache, edema, sweating, blisters, bleeding, vo-

wide variety of temporary or permanent neurotoxic events.^{7,8}

The importance of accidents with venomous animals was such that the Ministry of Health created the National Program for the Control of Accidents by Venomous Animals in the mid-1980s and since 1993, the notification of these events has become compulsory through SINAN.⁷

Keep the environment clean, combat the spread of the etiological agent, wear boots and gloves during activities, examine clothes and shoes before wearing them, placing screens on windows and holes that allow these animals to enter domestic environments are some effective prophylactic measures in combating accidents caused by these animals.⁴

Therefore, associated with cases of underreporting, a study is necessary to describe the occurrence and profile of accidents involving venomous animals in Brazilian territory between the years 2010 and 2019, in order to obtain updated information that reflects the real scenario and assist in the prevention and treatment of new cases.

METHODS

Study Type and Database

This is an observational, cross-sectional, quantitative, retrospective and epidemiological study. The secondary data used were obtained during the period of July and December 2021 through the Information System of Notifiable Diseases (SINAN) available on the website of the Department of Informatics of the Unified Health System (DATASUS), maintained by the Ministry of Health.

Data Collection and Inclusion Variables

The following variables were collected and analyzed: Type of accident; Number of cases by health region of residence; gender; age group; Education; Evolution of the case, during the years 2010 to 2019. The cases reported on the platform were tabulated and their frequency was analyzed in the Microsoft Office

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miting, abdominal pain, hypertension, hypotension, cardiac arrhythmias and/or arrest, seizures, collapse, shock, and a

Excel 2019 software, and results outside the stipulated time period were excluded from the survey.

RESULTS AND DISCUSSION

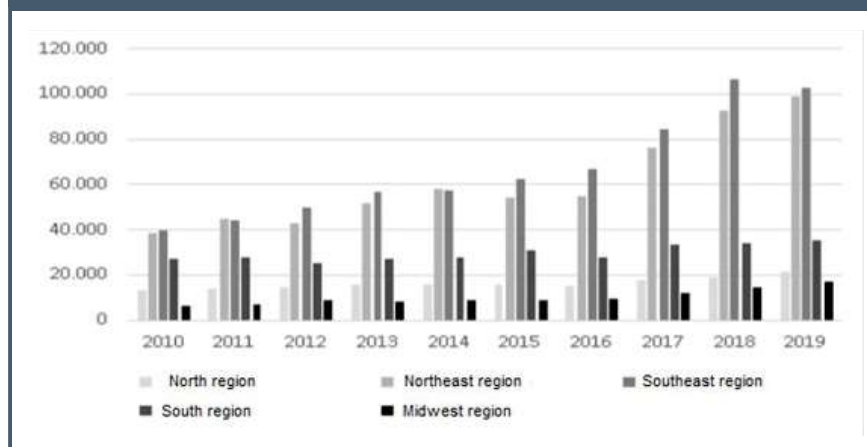
In Brazil, between 2010 and 2019, 1,844,384 cases of accidents by venomous animals were recorded. There is an increase in the number of accidents annually, with the year 2019 showing the highest number of cases, respectively (Figure 1).

Regarding the regional distribution, the Southeast presented 670,480 (36.35%) cases, followed by the Northeast Region with 612,685 (33.22%), the South with 296,281 (16.06%), the North with 163,488 (8.86%) and the Midwest with 101,450 (5.50%) notifications.

Se observó un predominio de casos en pacientes del sexo masculino, generalmente trabajadores de áreas rurales que trabajaban en ocupaciones como pesca y agricultura sin equipo de protección personal adecuado para este tipo de actividades⁶. Según los hallazgos, para la variable género, los individuos del sexo masculino presentaron mayor número de notificaciones con 55,68% frente a las mujeres con 44,30% de los casos, mientras que los registros ignorados (0,02%) fueron marcadamente inferiores a los casos notificados (Cuadro 1). Además, existe una preponderancia de accidentes en personas residentes en zonas rurales, que suelen trabajar directamente en actividades en el campo o en áreas boscosas¹¹.

In relation to age group, individuals belonging to the group between 20 and 39 years (33.01%) were the most affected by accidents, followed by the group from 40 to 59 years old (26.61%), since these groups comprise the age group of the economically active population^{11,12} and are more exposed to the risk of accidents during activities.⁶ On the other hand, the elderly aged 80 years or older (1.34%) were the least affected. It is important to note that even those less affected had a high number of cases,

Figure 1- Number of accidents by venomous animals by year of occurrence by region, Brazil, 2010 – 2019.



Source: Adapted from SINAN data, 2021.

Tabla 1 - Características epidemiológicas según sexo y región de los casos de accidentes por animales ponzoñosos, Brasil, 2010 – 2019

Variable	Total						Percentage (%)
	Male	%	Female	%	Ign	%	
North region	117.779	11,47	45.688	5,59	21	5,12	8,86
Northeast region	300.549	29,27	312.004	38,19	132	32,20	33,22
Southeast region	389.341	37,91	280.920	34,38	219	53,41	36,35
South region	158.382	15,42	137.874	16,88	25	6,10	16,06
Midwest region	60.897	5,93	40.540	4,96	13	3,17	5,50
Total	1.026.948	55,68	817.026	44,30	410	0,02	100

Source: Adapted from SINAN data, 2021

Table 2 – Age range of cases of accidents by venomous animals, Brazil, 2010 – 2019.

Age Group (year)	Total	Percentage (%)
Blank / IGN	296	0,02
<1	25.650	1,39
1 - 19	471.391	25,56
20-39	608.778	33,01
40-59	490.861	26,61
60-79	222.639	12,07
80 e +	24.764	1,34
Total	1.844.379	100

Source: Adapted from SINAN data, 2021.

exceeding 20,000 records, in addition, there was a small number of blank/ign cases for this variable (Table 2). Another point to be highlighted refers to the data provided by the Information Technology Department of the Unified Health System (DATASUS), did not present records of five cases of accidents by venomous animals, which were also not included in the blank/ign cases, configuring a failure in the recording of this information.

Individuals who had not completed the fifth to eighth grade of elementary school were the ones who had the most accidents by venomous animals, with the exception of the Southeast region, which presented individuals with complete high school as the most affected (Table 3).

Most cases progressed to a state of cure, totaling more than 1 million people, that is, there were fewer deaths from both the reported disease and other causes. This fact may be related to greater agility in assisting victims and availability of sera for the treatment against toxins of venomous animals 8, however, a considerable amount of blank/ign cases was obtained (Graph 2), so these values are not definitive, and there may be a greater number of deaths.

CONCLUSION

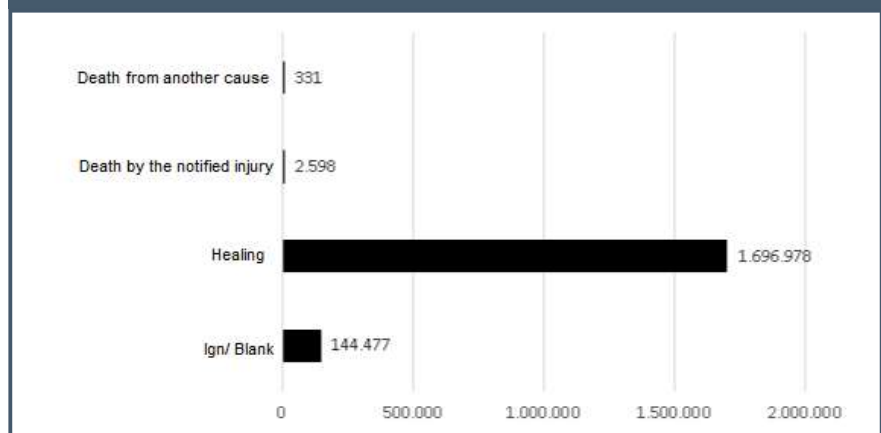
Accidents with venomous animals are a reality in Brazilian regions, where many factors favor accidents, such as the inappropriate use or non-use of Personal Protective Equipment (PPE), environmental characteristics and housing structural conditions. In addition, underreporting is an obstacle to be overcome in order to obtain reliable data for the best use of Information Policies. Therefore, it is necessary to carry out public policies aimed at providing adequate information to the inhabitants of the regions most affected by accidents with venomous animals, especially with regard to management, prevention and how to act after the accident.

Table 3 - Cases of accidents by venomous animals according to schooling and region, Brazil, 2010 - 2019.

Education	North region	Northeast region	Southeast region	South region	Midwest region	Total
Ign/Blank	47.134	293.935	240.143	59.718	41.103	682.033
Illiterate	7.336	16.989	11.182	3.463	1.913	40.883
Incomplete 1st to 4th grade of Elementary School	28.974	53.053	72.678	39.672	9.742	204.119
4th grade complete of Elementary School	10.997	22.071	38.356	23.505	4.397	99.326
5th to 8th grade incomplete of Elementary School	25.186	50.952	75.967	43.051	12.471	207.627
Complete Elementary School	7.305	24.335	36.772	20.496	4.837	93.745
Incomplete High School	8.981	24.152	41.570	22.624	6.117	103.444
Complete High School	12.201	49.955	82.442	41.590	9.217	195.405
Incomplete Higher education	1.322	5.316	7.225	5.946	1.365	21.174
Complete Higher education	2.371	9.989	14.291	9.622	2.316	38.589
Does not apply	11.681	61.938	49.854	26.594	7.972	158.039

Source: Adapted from SINAN data, 2021.

Figure 2- Clinical evolution of cases of accidents by venomous animals, Brazil, 2010 - 2019.



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