Seasonality of accidents involving venomnous animals in Cáceres-MT (2024-2025).

Sazonalidade dos acidentes por animais peçonhentos em Cáceres-MT (2024-2025).

Sazonalidade de los accidentes por venenosos en Cáceres-MT (2024-2025).

Adriani Castro de Lima[1], Adam Garcia Pereira[2], Bruno Henrique Silva de Paula[3], Lucas Alves Barbosa[4], Thiago Duarte Marcelli[5], Saulo Fernando Ribeiro Nogueira[6], Adriano Marcos Romano[7].

How to cite: *Lima AC, Pereira AG, Paula BHS Marcelli TD, Nogueira SFR, Romano AM.* Seasonality of accidents involving venomnous animals in Cáceres-MT (2024-2025). REVISA. 2026; 15(Esp.3): 148-153. Doi: https://doi.org/10.36239/revisa.v15.nEsp3.p148a153.

1. Universidade do Estado do Mato Grosso. Curso de Medicina. Cáceres, Mato Grosso. Brasil. https://orcid.org/0009-0006-6161-1237

2. Universidade do Estado do Mato Grosso. Curso de Medicina. Cáceres, Mato Grosso. Brasil. https://orcid.org/0009-0004-4885-095X

3. Universidade do Estado do Mato Grosso. Curso de Medicina. Cáceres, Mato Grosso. Brasil. https://orcid.org/0009-0001-4877-1969

4. Universidade do Estado do Mato Grosso. Curso de Medicina. Cáceres, Mato Grosso. Brasil. https://orcid.org/0009-0007-6118-4818

5. Universidade do Estado do Mato Grosso. Curso de Medicina. Cáceres, Mato Grosso. Brasil. https://orcid.org/0009-0008-6779-9482

6. Universidade do Estado do Mato Grosso. Curso de Medicina. Cáceres, Mato Grosso. Brasil. https://orcid.org/0009-0005-2666-7211

7. Universidade do Estado do Mato Grosso. Curso de Medicina. Cáceres, Mato Grosso. Brasil. https://orcid.org/0000-0003-4418-5070

Recebido: 20/01/2026
Aprovado: 10/03/2026

ORIGINAL

RESUMO

Objetivo: Os acidentes por animais peçonhentos são um relevante problema de saúde pública, especialmente em regiões tropicais, devido à alta biodiversidade e ao frequente contato humano com o ambiente natural. Este estudo teve como objetivo caracterizar o perfil epidemiológico dos acidentes por animais peçonhentos no município de Cáceres-MT, entre abril de 2024 e março de 2025, com análise de variáveis como sazonalidade, tipos de animais envolvidos e características das vítimas. Os dados foram obtidos do Sistema de Informação de Agravos de Notificação (SINAN) e analisados de forma descritiva. Durante o período analisado, foram registrados 165 casos, predominando vítimas na faixa etária de 40 a 59 anos (29,09%) e do sexo masculino (53,9%). Escorpiões foram os principais responsáveis pelos acidentes (70,3%), seguidos por serpentes (21,2%) e outros animais (8,5%). O padrão sazonal revelou maior incidência durante o verão (54 casos), com associação significativa entre os escorpiões e as estações inverno e verão (p = 0,0014). A maioria dos casos foi classificada como leve, sem registros de óbitos. Esses achados reforçam a necessidade de estratégias de educação em saúde e medidas preventivas para minimizar os riscos associados a esses acidentes no município.

Palavras-chave: Sistemas de Informação em Saúde, Animais Venenosos; Vigilância Epidemiológica.

ABSTRACT

Objective: Accidents caused by venomous animals are a significant public health issue, particularly in tropical regions due to high biodiversity and frequent human interaction with natural environments. This study aimed to characterize the epidemiological profile of accidents involving venomous animals in Cáceres-MT, between April 2024 and March 2025, analyzing variables such as seasonality, types of animals involved, and victim characteristics. The data were obtained from the Notifiable Diseases Information System (SINAN) and analyzed descriptively. During the analyzed period, 165 cases were recorded, with victims predominantly aged 40 to 59 years (29.09%) and male (53.9%). Scorpions were the main cause of accidents (70.3%), followed by snakes (21.2%) and other animals (8.5%). Seasonal patterns revealed a higher incidence during summer (54 cases), with a significant association between scorpions and the winter and summer seasons (p = 0.0014). Most cases were classified as mild, with no fatalities reported. These findings reinforce the need for health education strategies and preventive measures to minimize risks associated with such accidents in the municipality.

Keywords: Health Information Systems, Poisonous Animals; Epidemiological Surveillance.

RESUMEN

Objetivo: Los accidentes causados por animales venenosos representan un problema importante de salud pública, especialmente en regiones tropicales, debido a la alta biodiversidad y la interacción frecuente de los humanos con los entornos naturales. Este estudio tuvo como objetivo caracterizar el perfil epidemiológico de los accidentes con animales venenosos en Cáceres-MT, entre abril de 2024 y marzo de 2025, analizando variables como estacionalidad, tipos de animales involucrados y características de las víctimas. Los datos fueron obtenidos del Sistema de Información de Agravios de Notificación (SINAN) y fueron analizados de forma descriptiva. Durante el período analizado, se registraron 165 casos, con predominancia de víctimas entre 40 y 59 años (29,09%) y del sexo masculino (53,9%). Los escorpiones fueron la principal causa de los accidentes (70,3%), seguidos de serpientes (21,2%) y otros animales (8,5%). Los patrones estacionales revelaron una mayor incidencia durante el verano (54 casos), con una asociación significativa entre los escorpiones y las estaciones de invierno y verano (p = 0,0014). La mayoría de los casos fueron clasificados como leves, sin registro de fallecimientos. Estos hallazgos refuerzan la necesidad de estrategias de educación en salud y medidas preventivas para minimizar los riesgos asociados con estos accidentes en el municipio.

Descriptores: Sistemas de Información Sanitaria, Animales Venenosos; Vigilancia Epidemiológica.

Introduction

Accidents involving venomous animals represent an important public health issue, especially in tropical areas, where high biodiversity and frequent human interaction with natural environments increase the risk. It is estimated that, globally, between 1.8 and 2.7 million cases of snakebite envenoming occur annually, causing 81,000 to 138,000 deaths, highlighting the severity of this problem[1]. In Brazil, these events are of compulsory notification due to the magnitude of mortality and the potential for temporary or permanent sequelae. More than 130,000 cases are reported annually, with snakes, scorpions, spiders, and bees being the main causes, showing varied geographic distribution across the country[2].

In the Central-West region, due to large rural areas and frequent contact with fauna, a high incidence of these events is observed, particularly in the state of Mato Grosso, where the average rate was 42.7 cases per 100,000 inhabitants between 2015 and 20203,4. In this context, the municipality of Cáceres, located on the banks of the Paraguay River and near forested areas, presents favorable conditions for venomous animal accidents, reinforcing the importance of epidemiological studies to support preventive strategies and improve clinical management of cases[5].

This study aimed to explore the occurrence of venomous animal accidents in Cáceres-MT in a descriptive and retrospective manner, describing the epidemiological profile of accidents from April 1, 2024, to March 31, 2025, focusing on seasonal patterns, types of animals involved, and characteristics of victims. This survey intends to contribute to the identification of epidemiological patterns that assist in control and prevention strategies.

Methods

This study consisted of a descriptive and retrospective epidemiological survey. Data were collected from public records of the Unified Health System Database (DATASUS), using the Notifiable Diseases Information System (SINAN). As this study used secondary, publicly available data with no individual identification, it was not submitted to a Research Ethics Committee (CEP). All cases of venomous animal accidents involving residents of Cáceres-MT, from April 1, 2024, to March 31, 2025, were included.

Selected variables included: month of notification, type of offending animal, sex, age group of the victim, and clinical outcome (cure or death). To analyze seasonality, months were categorized as follows: autumn (April, May, June 2024), winter (July, August, September 2024), spring (October, November, December 2024), and summer (January, February, March 2025).

Data extracted from SINAN were organized, tabulated, and analyzed using Google Sheets (2025 version). Descriptive statistics were performed through frequency and proportion calculations, and the Chi-square test ($p<0.05$) was used to test associations between seasons and accidents.

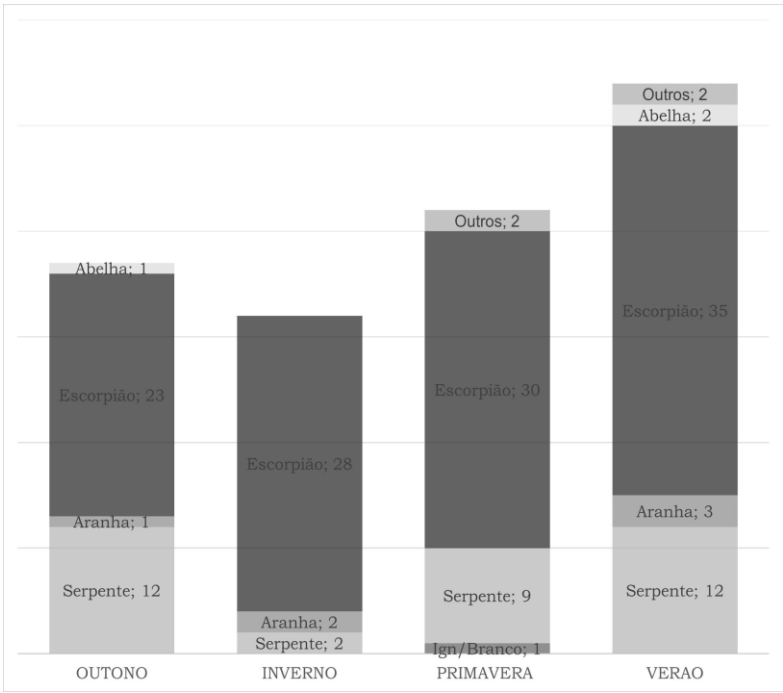
Results

During the period from April 2024 to March 2025, 165 cases of accidents involving venomous animals were recorded in the municipality of Cáceres, Mato Grosso. The highest incidence occurred in the 40–59 age group, representing 29.09% of the cases (49 occurrences), closely followed by the 20–39 age group, with 28.48% (47 occurrences). Males were slightly more affected, with 89 cases, compared to females, with 76 accidents.

Regarding the types of accidents, scorpions were the most frequently involved animals, representing the majority of reported cases in all seasons, with a total of 116 occurrences. Next were snakes, with 35 cases, and spiders, with 6 cases. Other animals, such as bees, accounted for 7 cases during the period.

Seasonal analysis showed that summer had the highest number of notifications (54 occurrences), followed by spring (42), autumn (37), and winter (32). A significant association was found between the winter and summer seasons and scorpion accidents (p=0.0014), indicating that the proportion of scorpion bites differs between these periods.

Figure 1 - Seasonal distribution of accidents involving venomous animals in Cáceres-MT from autumn 2024 to summer 2025 (total of 165 occurrences).



Source: Adapted from SINAN/DATASUS/MS, 2025

Most accidents were classified as mild, totaling 154 cases. Moderate accidents accounted for 10 occurrences, and no severe cases were reported. All 165 cases resulted in recovery, with no deaths reported during the study period.

Discussion

Social and demographic factors must be considered, as Cáceres has a predominantly economically active population, and much of its economy derives from rural work. This combination increases interaction with venomous animals, consistent with the higher incidence observed in the 20–39 and 40–59 age groups[6]. Males were more affected, as they typically engage in manual labor and are more exposed to venomous animals[7].

Furthermore, analyzing the accidental distribution, there is a considerably higher incidence involving scorpions, which are involved in the largest share of interactions in all seasons. This information can be explained by the ability of these animals to adapt to various environments, both rural, where they have normally lived, and urban, where they find food and shelter that support their survival and reproduction, which increases the frequency of encounters with humans[7].

Similarly, the seasonality of the accidents, notably variable in relation to the wetter and hotter seasons, especially peaking in summer, is supported by the literature, which describes that the rainier and hotter months favor greater activity of venomous animals and humans, resulting in more interactions[6]. A statistical analysis can confirm that the difference in the occurrence of accidents caused by scorpions between summer and winter is significant, reinforcing the seasonal pattern for this type of accident[6].

Moreover, the severity of the accidents described may suggest the efficiency of management measures applied by the health team and the response of the local health service, as well as the adequate infrastructure of the locality to handle such cases, mainly because almost all cases were classified as mild, with evolution to recovery and no recorded deaths[6]. Likewise, timely healthcare interventions allowed the application of appropriate and effective treatment, in addition to patient observation and reassessment, which contributed to reducing the probability of negative or complicated outcomes. The absence of reported severe cases demonstrates the effectiveness of the local health services' response to these incidents[8].

Final Considerations

In summary, after a thorough analysis of the cited information, it is possible to reach certain conclusions: the difference between male and female sexes is not expressive, with the incidence of accidents being close in both sexes, 53.9% and 46.1%, respectively[6]. The economically active age group (40–59 years and 20–39

years) are the most affected by venomous animals. Scorpions account for the majority of attacks, occurring both in urban and rural areas, without a large distinction in the quantity in either environment. Wetter and hotter seasons contribute to the activity, reproduction, and accidents involving venomous animals. Finally, the quality and expertise of the health team are crucial for positive outcomes in any accident cases[6,8].

References

1. Chippaux, J. P. (2017). Snakebite envenomation turns again into a neglected tropical disease! Journal of Venomous Animals and Toxins including Tropical Diseases, *23*(38). https://doi.org/10.1186/s40409-017-0127-6.

2. Ministério da Saúde. (2022). Acidentes por animais peçonhentos: Situação epidemiológica. *Boletim Epidemiológico.* Disponível em: https://www.gov.br/saude.

3. Duarte, C. G. B., Moraes, L. C., & Souza, J. D. (2021). Epidemiologia dos acidentes com animais peçonhentos no Centro-Oeste brasileiro: Uma análise dos registros de 2015 a 2020. Revista de Saúde Pública do Brasil, *55*(1), 98-105. https://doi.org/10.1590/S2176-27382021000100010.

4. SINAN. Sistema de Informações de Agravos de Notificação. Tabulação de Dados. Disponível em: https://portalsinan.saude.gov.br/dados-epidemiologicos-sinan. Acesso em: 28/08/2025.

5. Instituto Brasileiro de Geografia e Estatística. Conheça o Brasil - Território. Mato Grosso: Instituto Brasileiro de Geografia e Estatística; c2022 Disponível em: https://educa.ibge.gov.br/jovens/conheca-o-brasil/territorio/20591-introducao.html

6. Oliveira AJ de, Andrade EA de, Santos RCS, Santos AA. Um ESCORPIONISMO NO BRASIL: UMA ANÁLISE ESPACIAL E TEMPORAL DA OCORRÊNCIA DE ACIDENTES E ÓBITOS. Revista de Gestão Social e Ambiental. 2024 Oct 14;18(10):e08606.

7. Ministério da Saúde Boletim Epidemiológico SECRETARIA DE VIGILÂNCIA EM SAÚDE E AMBIENTE [Internet]. Available from: https://www.gov.br/saude/pt-br/centrais-de-conteudo/publicacoes/boletins/epidemiologicos/edicoes/2024/boletim-epidemiologico-volume-55-no-03/@@download/file

8. Boletim Epidemiológico SECRETARIA DE VIGILÂNCIA EM SAÚDE E AMBIENTE MINISTÉRIO DA SAÚDE [Internet]. 2023. Available from: https://www.gov.br/saude/pt-br/centrais-de-conteudo/publicacoes/boletins/epidemiologicos/edicoes/2025/boletim-epidemiologico-no-5-vol-56-15-de-abr.pdf/@@download/file

Correspondent Author:

Adriani Castro de Lima
Rua Ana Fontes, 17, Cavalhada 1,
CEP: 78216-100.
Cáceres, Mato Grosso, Brasil.
adriani.lima@unemat.br