

## Hospitalization of injured motorcyclists in Brazil from 2011 to 2021

Internação hospitalar de motociclistas acidentados no Brasil de 2011 a 2021

Hospitalización de motociclistas heridos en Brasil de 2011 a 2021

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### **Abstract**

The motorcycle accident, its social and economic costs to society are topics widely debated and discussed today, since the trauma disease is responsible for numerous cases of hospitalization, injuries in target organs and sequelae. In addition, it presents itself as the main cause of death in young people and the economically active population. The present study aims to characterize the profile of hospitalizations due to traffic accidents involving motorcyclists in Brazil, reported in the DATASUS database. This is an epidemiological, retrospective, descriptive and analytical study of a historical series from 2011 to 2021. Education and prevention is essential in actions to control motorcycle accidents, seeking to reduce mortality and physical disability of victims after trauma. Epidemiological surveillance and preventive campaigns must be active and continuously intensified, seeking to eliminate accidents for the benefit of the individual and society.

**Keywords:** Motorcyclist; Accident; Internment; Prevention.

### **Resumo**

O acidente por motocicleta, seus custos sociais e econômicos à sociedade são temas amplamente debatidos e discutidos na atualidade, uma vez que a doença trauma é responsável por inúmeros casos de internação, lesões em órgãos alvos e sequelas. Além, de apresentar-se como principal causa de morte nos jovens e na população economicamente ativa. O presente estudo objetiva caracterizar o perfil das internações por acidente de trânsito envolvendo motociclistas no Brasil, notificadas no banco de dados do DATASUS. Trata-se de um estudo epidemiológico, retrospectivo, descritivo e analítico de uma série histórica no período de 2011 a 2021. É essencial a educação e prevenção nas ações no controle dos acidentes com motocicletas, buscando redução da mortalidade e na incapacidade física das vítimas pós trauma. A vigilância epidemiológica e as campanhas preventivas devem ser ativas e intensificadas de forma contínua, buscando atingir a eliminação dos acidentes em benefício do indivíduo e da sociedade.

**Palavras-chave:** Motociclista; Acidente; Internação; Prevenção.

## Resumen

El accidente de motocicleta, sus costos sociales y económicos para la sociedad son temas ampliamente debatidos y discutidos en la actualidad, ya que la enfermedad traumática es responsable de numerosos casos de hospitalización, lesiones en órganos diana y secuelas. Además, se presenta como la principal causa de muerte en jóvenes y población económicamente activa. El presente estudio tiene como objetivo caracterizar el perfil de hospitalizaciones por accidentes de tránsito involucrando motociclistas en Brasil, informados en la base de datos DATASUS. Se trata de un estudio epidemiológico, retrospectivo, descriptivo y analítico de una serie histórica de 2011 a 2021. La educación y la prevención son fundamentales en las acciones de control de los accidentes de motocicleta, buscando reducir la mortalidad y la discapacidad física de las víctimas después de un traumatismo. La vigilancia epidemiológica y las campañas preventivas deben ser activas y continuamente intensificadas, buscando eliminar los accidentes en beneficio del individuo y de la sociedad.

**Palabras clave:** Motociclista; Accidente; Internación; Prevención.

## 1. Introduction

Contemporaneously, trauma has become a serious public health problem, affecting the victim in biological, psychological and social terms. According to data from the World Health Organization (WHO) more than nine people of all sexes and economic groups die every minute from trauma or violence. The traffic accident is the protagonist of this number of deaths, as the main cause of death in trauma in the world (Subcommittee & International ATLS Working Group, 2013).

According to Martins et al. (2013), currently 1.2 million people die every year from road traffic accidents (ATT), highlighting the psychological sequelae and disabilities that compromise a high number of people, generating family disruption and great social and financial cost for the children. countries.

In Brazil, the numbers of ATT have been increasing progressively. The mortality recorded in the country by this disease, in 2004, was around 35,084 deaths. Of this total, 28,576 (81.5%) were male and 6,495 (18.5%) were female (Brasil, 2001; de Noronha & de Moraes, 2011).

The numerical value of these data is unquestionable, however the real social and economic cost to society – demands government sectors, social segments and the civil population – can only be evaluated if we consider that the trauma affects the young and potentially more productive members of society (Subcommittee & International ATLS Working Group, 2013).

The dimension of this problem reflects the need to implement public social policies to monitor and prevent these diseases. Trauma should be seen as a disease, having the host (humans) and transmission vector (motorcycles, cars, etc.). Therefore, prevention would be able to significantly reduce these trauma morbidity and mortality data. With this perspective, the Ministry of Health, in May 2001, through Ministerial Ordinance No. traffic injuries and violence, while an improvement in the population's quality of life is estimated (Brasil, 2001).

In Brazil, research carried out in some Brazilian cities reveals that motorcycles stand out in the occurrence of traffic accidents (Borges, 2005). This is a reflection of the expressive growth in the number of motorcycles in circulation and the high frequency of inappropriate behavior, combined with insufficient surveillance and the greater vulnerability of motorcycles in relation to cars (Bastos et al., 2005).

In this sense, studies show that the increase in the motorcycle fleet in the country has been presented as a reason for concern, in view of the vulnerability and exposure to risk of accidents due to the inequality of force regarding the impact with another larger vehicle. This is because the motorcycle does not have an adequate structure to protect the rider, where all impact energy is absorbed ejecting it at a distance (Koizumi, 1985; Soares, 1977; Soares et al., 2015; Silva et al., 2011; Bastos et al., 2005).

At the end of 2008, the number of motorcycles was over 11 million units. At the same time, official records of traffic accidents indicate that, since the year 2000, annually about 9% of motorcycles in circulation are involved in some type of accident and that about 2% involve accidents with victims (Andriow, 2009). ). The data also show that, annually, there is one

case of death by motorcycle accident for every 600 motorcycles in circulation, reaching the conclusion that this year 2009 we have about 1 million traffic accidents involving motorcycles in Brazil, which caused about 214,000 hospitalizations and about 18,000 deaths (Andriow, 2009; Soares et al., 2015).

Although motorcycle accidents affect all age groups, sexes and economic groups, the historical profile is predominantly male, under 40 years of age - between 18 and 24 years old. Schooling is usually incomplete Elementary and High School (Koizumi, 1992; Golias & Caetano, 2013; Lima et al., 2013; Silva et al., 2017). Explaining the predominance of males and young people in traffic accidents, Soares (1997) highlights that this fact occurs due to the greater exposure of these individuals and the association of the use of alcohol, tobacco and/or other drugs.

## 2. Methodology

This is an epidemiological, retrospective, descriptive and analytical study. Cases reported as a transport accident involving a motorcyclist (ICD-10: V20-V29) whose place of hospitalization or mortality was in Brazil in the period between 2011 and 2021 will be used. transport accidents.

The proportions of hospitalizations were calculated through the SIH (Inpatient Information System) and mortality from the SIM (Mortality Information System) in Brazil for this specific circumstance among all causes, excluding hospitalizations related to childbirth, according to the sex, age and location.

All cases of hospitalization and death reported as a transport accident involving motorcyclists in Brazil will be used as inclusion criteria.

The data extracted from the DATASUS database were tabulated in an Excel spreadsheet, where tables and graphs were prepared. These data were exposed and analyzed during the work. For the interpretation of the data, a theoretical basis was used that addresses motorcycle accidents.

As it is an ecological study based on secondary data in the public domain, it does not need to be evaluated by the Research Ethics Committee. However, the recommendations of Resolution 466/12 of the National Health Council were met.

## 3. Results and Discussion

With the growth of the motorcycle fleet, the occupants of these vehicles are regularly assuming the first area among the victims of traffic accidents with motor vehicles (Silva et al., 2015). Among the factors for the excessive costs of bicycle accidents are the increase in the number of motorcycles, the frenetic traffic and especially the imprudence of the drivers, inflicting an overload on the health machine and, consequently, on the whole society. The increase in the use of motorcycles is justified by their benefits in relation to automobiles, such as agility, economy and greater ease in traffic; which makes the bicycle a socially essential transport potential (Silva & Paiva, 2017; Rocha & Schor, 2013).

This can be explained by the fact that men represent the highest proportion of people who use motorcycles as a means of transport, and are therefore more prone to accidents. The age group distribution of the crew showed that the majority of the population hospitalized due to a motorcycle accident was younger adults, aged between 20 and 29 years, as in the research by Pinheiro and Queiroz (2020), which showed that the population protected in this age group was most affected by these incidents. This reality can be defined through greater efforts in this age group, exposing themselves extra to the elements of chance and with a less prudent profile regarding usage habits, often inconsequential, due to age.

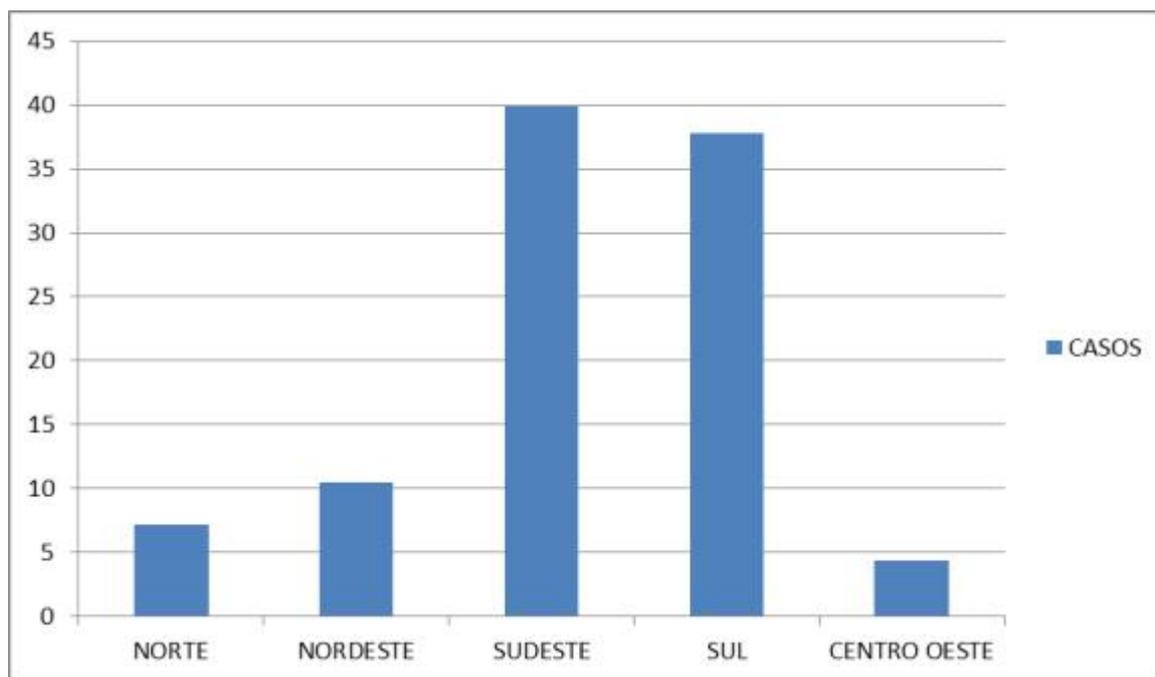
Until the year 2021 in Brazil there were 8376 cases of hospitalizations due to transport accidents involving motorcyclists. Between 2011 and 2019, there were 107,373 motorcyclist deaths from preventable causes. Most were male (88.2%), aged between 20 and 29 years (38.2%) and 30 and 39 years (26.5%). Most individuals (75.2%) had no information

about race, 17.2% self-declared mixed race and 3.2% declared themselves white at the time of admission.

As for the place where the hospitalizations took place, by geographic region and year, there was a predominance in the Southeast region, more specifically in São Paulo, followed by the South and Northeast regions.

Although the incidence is increasing, the values differ between the Southeast and Midwest regions. The highest incidence occurs in the Southeast (39.9%) and South (37.8%) regions, followed by the Northeast (10.5%) and North (7.2%) regions, and finally the Central West region (4.4%) had the lowest number of cases (Figure 1).

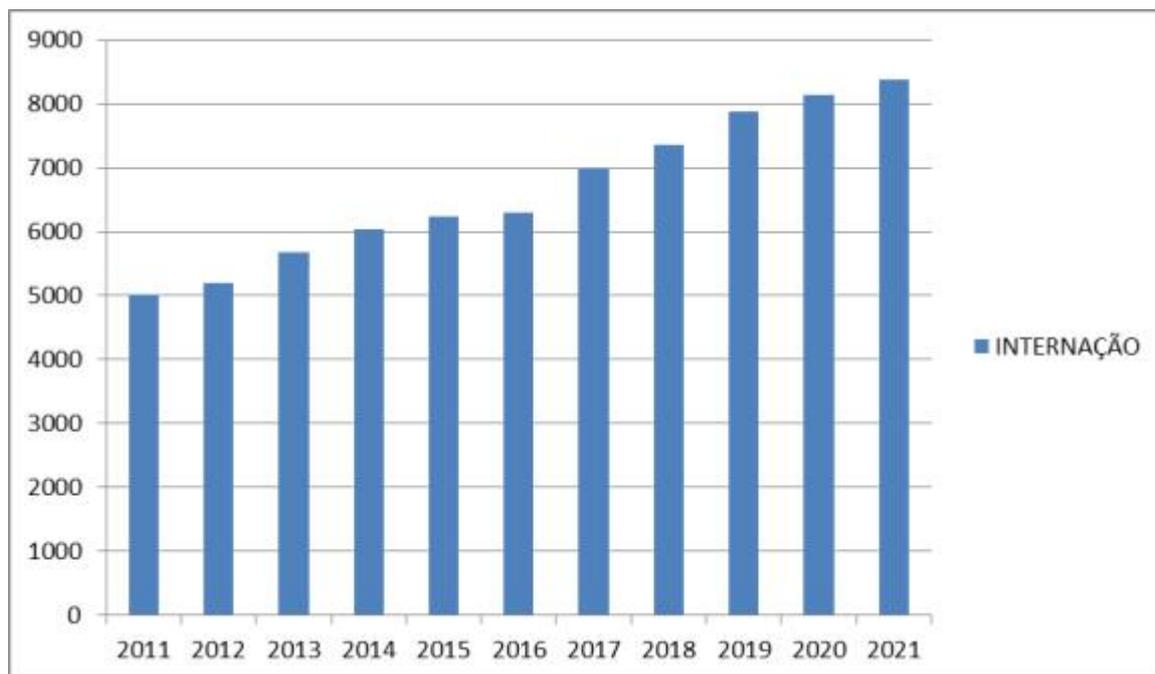
**Figure 1-** Incidence of motorcycle accident cases between 2011-2021. Brazil. 2022.



Source: Authors (2022).

In the period studied, there was an increase in the incidence of hospitalizations for motorcycle accidents from 5012 to 8376 in the ten-year period Figure 2.

**Figure 2-** Incidence of hospitalizations for motorcycles between 2011-2021. Brazil. 2022.



Source: Authors (2022).

There was an expenditure of approximately 411,303.68 on hospital services, the majority in the state of São Paulo (R\$159,054.86), obtaining a higher expenditure than the combination of the states of the North (R\$8,722.63), Northeast (R\$17,479.44) and Midwest (R\$10,054.07).

Speaking about hospital admissions resulting from motorcycle accidents, Koizumi (1992) and Koizumi (1985) found an average hospital stay of 15.8 days per patient. This length of stay can be justified by the surgical procedures, both orthopedic, neurosurgical and oral and maxillofacial that these victims need to undergo. It is important to note that, even after hospital discharge, 80.2% of patients continue with outpatient follow-up (da Silva et al., 2020).

Furthermore, after a period of hospitalization that can vary, according to statistics, from six to 118 days, the survivor of a motorcycle accident will have a recovery period that will last from one to six months, although it may reach to exceed 18 months in the most severe cases (Andriow, 2009; Ramos et al., 2022).

Thus, in addition to the 18,000 deaths in motorcycle accidents in 2008, we will still have about 36,000 people who will be unable to work for a long period of time and another 11,000 who will never be able to walk again. If we consider that 67% of those involved in motorcycle accidents have not yet reached the age of 24, in 2008, around 7000 young people were sentenced to spend the next 10, 20, 40 years confined to a bed or a wheelchair (Andriow, 2009).

#### 4. Final Considerations

We can conclude that the epidemiological profile of injured motorcyclists are male, aged between 20 and 29 years, brown race. Having an increase in cases in the region. São Paulo was the state that received the most hospitalizations, causing millions of expenditures in Brazilian public health and influencing the distribution of expenses for other types of hospitalizations. Even so, it is necessary to raise the awareness of motorcyclists through traffic disciplinary measures.

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