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# ANALYSIS OF HOSPITALIZATION OCCURRED DUE TO MOTORCYCLES ACCIDENTS IN SÃO PAULO CITY

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## ABSTRACT

**Objective:** To characterize the motorcycle accidents occurred in the city of São Paulo, SP, Brazil in the year 2013, with emphasis on information about hospital admissions from SIH/SUS. **Methods:** This is a retrospective cross-sectional study. The study covered 5,597 motorcyclists traumatized in traffic accident during the year 2013 occurred in the city of São Paulo. A survey was conducted using secondary data from the Information System of Hospitalization Health System (SIH/SUS).

**Results:** In 2013, in the city of São Paulo there were 5,597 admissions of motorcyclists traumatized in traffic accidents, of which 89.8% were male. The admission diagnosis were: leg fracture, femur fracture, and intracranial injury. **Conclusion:** This study confirms other preliminary studies on several points, among which stands out the highest prevalence of male young adults. **Level of Evidence II, Retrospective Study.**

**Keywords:** Accidents, traffic. Hospitalization. Information systems.

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## INTRODUCTION

Traffic accidents constitute a major public health problem worldwide and require different prevention approaches.<sup>1-3</sup> Some studies characterizing the profile of accidents and their victims have pointed motorcycles as the most cited means of transportation.<sup>4,5</sup>

In Brazil, the increasing number of vehicles in recent decades, especially the motorcycle fleet, has been occupying more and more space in people's urban life by providing easy and speedy displacement as a work vehicle, currently contributing to the maintenance of high rates of traffic accidents.<sup>6,7</sup>

Traffic accidents determine harm to the injured and to society as well, such as high cost of medical and hospital bills and rehabilitation and recovery expenses, occurrence of temporary or permanent sequelae causing disability and sick leave from work.<sup>8</sup> According to data from the Ministry of Health,<sup>9</sup> 35,084 deaths were recorded from traffic accidents in Brazil during the year 2004. Of this total, approximately 82% were male. Most traffic accidents deaths occur in the Southeast Region, which also concentrates most of the population and the largest automotive fleet of the country.

The social and health impact caused by traffic accidents has been extensively studied, since the hospitalization rate of accident victims is an indicator of the severity of the accidents and can be used to monitor trends and to quantify the event that

represents a cost to health services, due to the high percentage of hospital admissions and high hospital care costs.<sup>10,11</sup>

The use of data routinely gathered by the Brazilian information systems in the health situation analysis and the impact of interventions has grown in recent years. The purpose of the Hospital Information System of the Unified Health System (SIH-SUS) is to make available information on the resources allocated to hospitals that are part of the Unified Health System (SUS) and the main causes of hospitalization. The Hospital Admission Authorization (HAA) is the document that constitute each record of its database.<sup>12,13</sup>

This research aimed to characterize the motorcycle accidents in the city of São Paulo-SP in the year 2013, with emphasis on information regarding hospital admissions provided by SIH-SUS.

## METHODS

This is a cross-sectional, quantitative, descriptive study, with a retrospective approach.

The study covered 5,597 motorcyclists traumatized in traffic accident in the period January-December 2013 occurred in the city of São Paulo.<sup>14</sup>

A survey was conducted using secondary data from SIH-SUS of the Municipal Health Secretariat of São Paulo, SP, Brazil, where the information on admissions are recorded through the Hospital Admission Authorization form (HAA).

All the authors declare that there is no potential conflict of interest referring to this article.

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The variables used for the study were: age (years), gender (male and female), hospital stay (in days), nursing specialty, nature of the service provided (elective, urgent), procedure performed, diagnosis upon admission, city of residence and city of hospital admission.

After collecting data, these were processed and tabulated. The data analysis was based on the descriptive statistics, which allowed calculation of absolute and relative frequencies.

The research project does not require approval by the Ethics Committee of the University, as it uses secondary data from a public domain database, as recommended by resolution 466/12 from *Conselho Nacional de Saúde* (CNS).

## RESULTS

According to SIH-SUS data, in 2013 there were 68,584 accidents of different types (external causes) in the city of São Paulo. Motorcyclists traumatized in traffic accidents accounted for 8.2% of cases (5,597).

Of the 5,597 cases of motorcyclists traumatized in traffic accidents 89.8% were male and 10.2% female.

The age of the most frequent casualties was 20-24 years old (22.0%) and 25-29 years old (19.1%). Regarding race/color, 41.2% were white and 30.1% multiracial Brazilians.

According to the care service modality of the injured motorcyclists, 60.6% were seen at the emergency room and according to the specialty, 81.7% were related to surgery.

The main diagnoses at admission were leg fracture, including ankle; femoral fracture and intracranial injury. (Table 1)

Regarding the duration of hospital stay most stayed for zero-7 days (76.9%); followed by 8-14 days (16.0%) and 15 days or more (7.1%).

According to the procedures, the most frequent were surgical treatment of fractures of the tibial shaft, treatment of location specific/non-specific trauma and surgical treatment in polytrauma. In 2013 the Unified Health System, through the payment of analysis of AIH with bikers traumatized in traffic accidents, spent R\$ 8,208,680.21. (Table 2)

According to the city of residence, 88.5% were injured in the city of São Paulo and the same occurred regarding the city of hospital admission.

**Table 1.** Traumatized motorcyclists in traffic accidents according to the main hospital admissions diagnosis, São Paulo city, 2013.

Main hospitalization diagnosis (CID-10)	N	F (%)
S02 - Skull and facial bones fracture	147	2.6
S06 - Intracranial trauma	557	10.0
S32 - Fracture of the lumbar spine and pelvis	144	2.6
S42 - Shoulder and arm fracture	236	4.2
S52 - Forearm fracture	339	6.1
S62 - Fracture at the wrist and hand level	200	3.6
S72 - Femoral fracture	663	11.8
S82 - Leg fracture including ankle	1525	27.2
S92 - Foot fracture	176	3.1
T01 - Injury involving multiple body regions	147	2.6
T02 - Fracture involving multiple body regions	346	6.2
Other diagnoses	1117	20.0
Total	5597	100.0

Source: SIH-SUS, 2014.

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**Table 2.** Hospital admissions of motorcyclists traumatized in traffic accidents according to the procedure performed and paid values, São Paulo city, 2013.

Procedure performed	N	F (%)	Paid values (R\$)
Diagnosis and / or urgent care in surgical clinic	275	4.9	19,758.30
Conservative treatment of traumatic brain injury (Light grade)	226	4	104,667.11
Conservative treatment of Traumatic brain injury (Medium Grade)	133	2.4	216,668.60
Treatment of location specific/non-specific trauma	665	11.7	190,667.88
Treatment of bimalleolar/trimalleolar fractures/fracture-dislocations	147	2.6	108,658.82
Surgical treatment of fractures of the tibial shaft	621	11.1	1,054,352.89
Surgical treatment of fractures of the femoral shaft	301	5.4	678,394.31
Surgical treatment of tibial plateau fracture	158	2.8	116,386.85
Surgical treatment of unimalleolar ankle fracture	140	2.5	119,500.05
Surgical treatment in polytrauma patients	520	9.3	1,785,267.93
Other procedures	241	43.3	3,814,357.47
Total	5597	100.0	8,208,680.21

Source: SIH-SU, 2014.

## DISCUSSION

In 2013 in the city of São Paulo 5,597 admissions of motorcyclists traumatized in traffic accidents were recorded, of which 89.8% were male. Other studies also observed the same prevalence of injured male drivers. The largest number and main victims are young adults aged less than 30 years old and in full productive capacity.<sup>9,15,16</sup>

For motorcyclists, the most affected body segments by trauma were leg fracture including the ankle, femur fracture and intracranial injury. (Table 1)

According to Sado *et al.*,<sup>17</sup> for motorcyclists, the body part most protected by safety equipment regarding impact is the head (helmet), and the upper and lower limbs are the body regions most susceptible and seriously injured. The most frequent types of injuries of the limbs are fractures, bruises and dislocations. Limb fractures are considered injuries of low or medium severity. However, they require prolonged immobilization, causing long periods of recovery, with significant economic and social costs.

Our results are consistent with the literature regarding body distribution of injuries, which occur mostly in the legs, as well as surgical treatment of the injured.

Improper use of some protective equipment and the neglect of their use by drivers are associated with a high injury rate. The use of helmets seems to be the only motorcycle drivers safety equipment recognized worldwide as an effective method to minimize the effects of head trauma; it is important to note that beyond helmets, use of protective clothing such as reinforced shoes and protections for the legs should provide greater protection and, consequently, reduce the rate of injuries, especially soft tissue injuries.<sup>8,17</sup>

The frequency of hospitalization related to motorcyclists traumatized in traffic accidents in the city of São Paulo, during the year 2013 was zero to seven days, corresponding to 76.9% of cases. External causes account for a higher average spending and high cost/day hospitalization than natural causes, despite the lower proportion of admissions and lower average hospitalization time.<sup>18</sup>

Hospitalizations for motorcyclists traumatized in traffic accidents in São Paulo in 2013 generated a cost of R\$ 8,208,680.21. The dimension of costs is quite large and only part of them was addressed here. We only analyzed the direct medical costs associated with hospitalization. Other direct care costs, such as pre-hospital care and rehabilitation treatment were not considered in this study.<sup>19</sup>

Motorcyclists traumatized in traffic accidents resided in São Paulo, and their hospital care was carried out at the place of residence. Possibly this shows the elements involved in the accidents, such as public roads, traffic education and lack of traffic control, among others. By choosing data by the city of residence of the victims,

the objective was to identify the place of residence of the affected people and, from that information, establish preventive and educational activities for the population.<sup>18</sup>

## CONCLUSION

This study confirms other preliminary studies on several points, among which stand out the highest prevalence of young male adults. The subject of this study is still little explored in the literature, regarding the estimates of hospital costs related to motorcyclists traumatized in traffic accidents.

Strategies should be implemented to propose prevention and control of traffic accidents, also specifically directed to motorcyclists.

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