

## Head Injuries Sustained during Sports and Recreation

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During the past two decades, the acute medical treatment for traumatic brain injuries has improved considerably. Now, many patients survive after experiencing severe injuries that would have proven fatal earlier. These persons require rehabilitative services that are different in kind and duration from those needed by most other injury victims. Recognizing the need to plan for, provide, and evaluate injury prevention activities and the services needed by head injury survivors, the Rhode Island General Assembly established a statewide Traumatic Brain Injury (TBI) Registry in 1986. This report presents statistics from the registry on serious head injuries among Rhode Island residents during 1996 and 1997 that were sustained during participation in sports or recreational activities.

**Methods.** The TBI Registry identifies cases of head injury that result in death or admission as a hospital inpatient through examination of (1) death certificate data, (2) hospital discharge data, (3) direct data submissions from hospitals to the registry, and (4) hospital trauma registry data. For 1996 and subsequent years, registry staff have abstracted data from hospital medical records and State Medical Examiner records for cases meeting the case definition established by the Centers for Disease Control and Prevention (CDC).<sup>1</sup> Where relevant data

sources are available, Rhode Island residents sustaining head injuries out of state have been included in the registry.

Head injuries sustained during sports or recreation were identified from information on the etiology and external cause of injury. Any case with an etiology code for a specific sport or with an external cause of either a fall during sports or collision during sports was defined as sports-related. Any case with an external cause related to bicycles, swimming, recreational boating, snowmobiles, off-road motor vehicles, horseback riding, or other recreational activity or identified as occurring at a place of recreation was defined as recreation-related. United States Bureau of the Census estimates were used as population denominators for rates.<sup>2</sup>

Severity of injury was determined based on information concerning (1) death at the injury scene or prior to hospital admission, (2) the patient's Glasgow Coma Score at admission, and (3) the patient's level of consciousness at admission. Based on these items, injury severity was ranked as follows: death, coma, moderate impairment of consciousness, and minimal or no impairment of consciousness.

**Results.** Rhode Island residents sustained a total of 1,378 head injuries during 1996 and 1997 that met the CDC case definition. Of these, 43 (3.1%) were sports-related and 108 (7.8%) were recreation-related. (Figure 1) [Included in the "All Other" category were falls, vehicle accidents, and physical assault.]

Younger persons and males were at elevated risk for head injuries related to sports and recreation. (Figure 2) Incidence rates were greatest among those ages 14 and younger; at higher ages, the incidence rate decreased with age until the age group 44 years and older, where it was less than one-tenth the rate among children and young adolescents. For other head injuries, the age pattern reflected the frequency of falls among the very young and the elderly and the frequency of motor vehicle crashes among adolescents and adults. By gender, males of all ages were three times as likely as females to sustain head injuries during sports and recreation.

Overall, head injuries due to sports and recreation were slightly less severe than head injuries sustained from other causes. (Table 1) Three-quarters or more of them resulted in minimal or no impairment of consciousness, compared to 70% of other head injuries. One exception to this general finding is

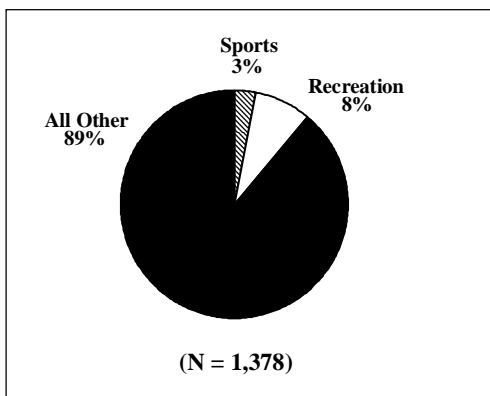


Figure 1. Traumatic Brain Injuries by Cause of Injury, Rhode Island, 1996-1997.

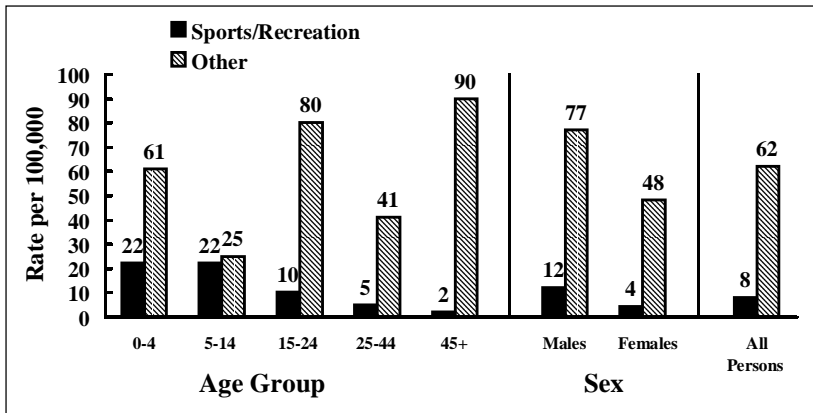


Figure 2. Traumatic Brain Injuries per 100,000 Population, by Age Group, Sex, and Cause of Injury, Rhode Island, 1996-1997 (Annual Average Rate)

that a relatively high, but not statistically significant, proportion (6%) of head injuries related to recreation resulted in death.

**Discussion.** One in nine serious head injuries in Rhode Island results from participation in sports or recreational activity. These injuries occur disproportionately among the very young and therefore have greater long-term impact on the individual, his or her family, and the state's rehabilitation and education systems.

Because of their numbers and the resources needed to treat them, head injuries have received increasing attention at the state and national level. In the past three years, the Rhode Island Department of Health has sought and obtained support from the CDC for head injury surveillance, through a cooperative agreement to improve the infrastructure for statewide TBI surveillance, and for head injury prevention, through a cooperative agreement to increase the use of bicycle helmets in the state. Last year, the Rhode Island Department of Human Services sought and obtained a grant

from the federal Health Resources and Services Administration to perform a needs assessment for head injury survivors. These efforts are first steps; they must be followed by sustained and expanded primary prevention efforts targeted at TBI and by the development and implementation of a comprehensive statewide program to meet the documented needs of persons with traumatic brain injuries.

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References

1. Thurman DJ, Sniezek JE, Johnson D, et al. Guidelines for Surveillance of Central Nervous System Injury. Atlanta: Centers for Disease Control and Prevention, 1995.
2. United States Bureau of the Census web site: [www.census.gov/hhes/www/saipe/stcty/estimate.html](http://www.census.gov/hhes/www/saipe/stcty/estimate.html).

Table 1. Distribution of Severity\* of Traumatic Brain Injury by Cause of Injury, Rhode Island, 1996-1997.

Severity*	Cause of Injury		
	Sports (N=43)	Recreation (N=108)	Other (N=1,227)
Death	0%	6%	2%
Coma	2%	7%	15%
Moderate impairment	9%	13%	13%
Minimal or no impairment	88%	75%	70%

\*Based on death or impairment of consciousness  
Note: Percentages may not total 100 due to rounding.

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