

Tennessee Department of Health  
Traumatic Brain Injury Program  
Clinical Services and Disease Management  
Cordell Hull Building, 4<sup>th</sup> Floor  
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Nashville, Tennessee 37243

# Tennessee Traumatic Brain Injury

2010  
January - June

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*A traumatic brain injury is defined as an acquired injury to the brain caused by an external physical force that may result in total or partial disability or impairment.*

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Tennessee Department of Health  
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January - June 2010  
Provisional Data

# Introduction

The legislation establishing the traumatic brain injury registry was signed into law in May, 1993. As written, the initial legislation prohibited health care providers from reporting case information without written consent of the patient. An amendment was passed in May, 1996 resolving this issue. Data collection officially began with patients discharged during 1996. The hospitals report information on inpatients, with specific ICD-9 CM diagnosis codes, whose admission and discharge dates are different (where length of stay was 24 hours or more) and for those individuals who died. Patients seen in emergency rooms who were sent home the same day or length of stay was less than 24 hours are not included in the registry.

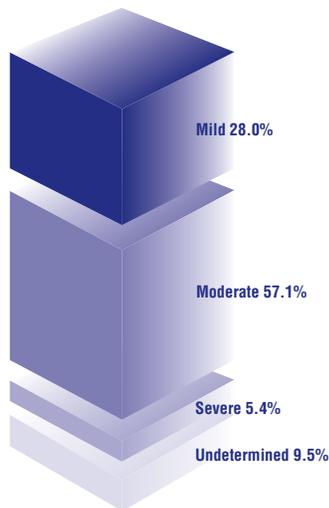
By statute, Tennessee hospitals are required to report to the Traumatic Brain Injury (TBI) Registry all inpatient confinements where the patient had a diagnosis of specific types of head injuries. Utilizing ICD-9-CM diagnosis codes, 3,827 new TBI cases were identified and added to the registry from January – June 2010.

The ICD-9-CM codes are used further to construct a severity index based on the clinical diagnosis of the injury. “Moderate” injuries made up 57.1 percent while 5.4 percent were considered “severe”. Another 28.0 percent of all TBI patients experienced a “mild” injury. Three hundred sixty-five (365) cases, or 9.5 percent had an insufficient clinical description and the severity for these cases was “undetermined.”

Excluding the patients that died, 68.7 percent of the patients were discharged for home care, which includes those requiring home health services and/or outpatient rehabilitation. This indicates a significant burden on the families and communities of the brain injured survivors. Of the patients with a “severe” traumatic brain injury 76.2 percent died. This category represents 41.5 percent of the total patients that died.

For patients with a “moderate” brain injury (excluding deaths) 62.4 percent were discharged for home care, which includes those requiring home health services and/or outpatient rehabilitation. Those discharged to a residential facility with skilled nursing staff, intermediate care facility or nursing home accounted for 17.0 percent and 13.3 percent were discharged to an inpatient rehabilitation facility. Excluding deaths, 83.7 percent of the patients with a “mild” brain injury were discharged to home care, which includes those requiring home health services and/or outpatient rehabilitation.

## Injuries by Severity



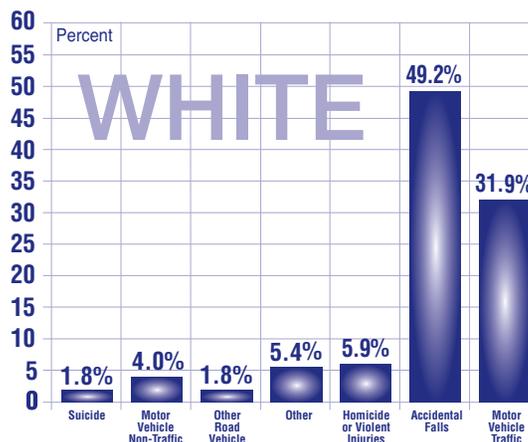
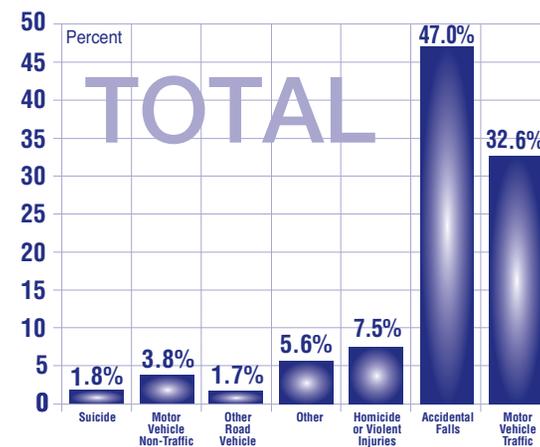
## Hospital Discharge Status by Severity of Injury

Discharge Status	Total	Severe	Moderate	Mild	Undetermined
Transferred to acute care hospital	71	7	44	11	9
Home - self care or non-skilled assistance	2,122	9	1,127	803	183
Home - health services or outpatient rehab	247	1	132	67	47
Residential facility with skilled nursing	509	16	343	78	72
Inpatient rehab facility	358	8	268	64	18
Against medical advise	26	0	22	2	2
Correctional Facility	28	1	19	5	3
Patient died	378	157	166	32	23
Other	88	7	64	9	8
Unknown	0	0	0	0	0
<b>Total</b>	<b>3,827</b>	<b>206</b>	<b>2,185</b>	<b>1,071</b>	<b>365</b>

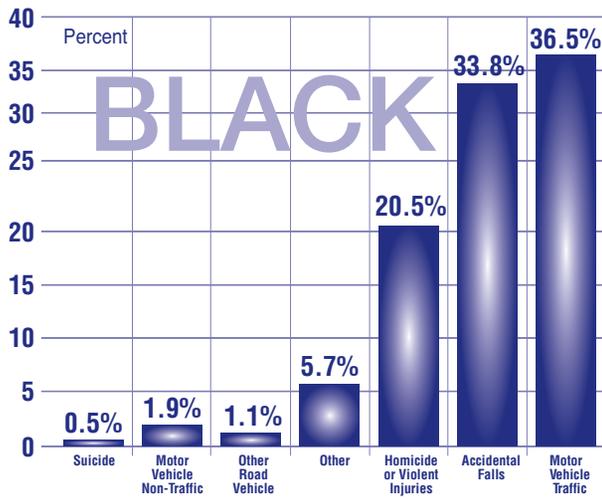
An external cause of injury permits the classification of environmental events, circumstances, and the conditions as the cause of injury. An external cause of injury was reported for 98.4 percent (3,765) of the 3,827 persons treated in Tennessee. The data presented by race represents 3,203 white and 370 black cases.

For the first time since Tennessee started collecting brain injury data in 1996, falls replaced motor vehicle traffic accidents as the number one cause of traumatic brain injuries during 2009. January through June 2010, falls continued to be the number one cause of traumatic brain injuries at 47.0 percent.

Motor vehicle traffic accidents accounted for 32.6 percent. Homicide or violent injuries, which includes injury undetermined whether accidentally or purposely inflicted and legal intervention, accounted for 7.5 percent of the total injuries. These figures include only cases with external cause of injury reported.



For whites, the leading cause of traumatic brain injury was accidental falls with 49.2 percent. The second leading cause of injury was motor vehicle traffic accidents with 31.9 percent. Homicide or violent injuries, which includes injury undetermined whether accidentally or purposely inflicted and legal intervention, accounted for 5.9 percent of the total injuries.

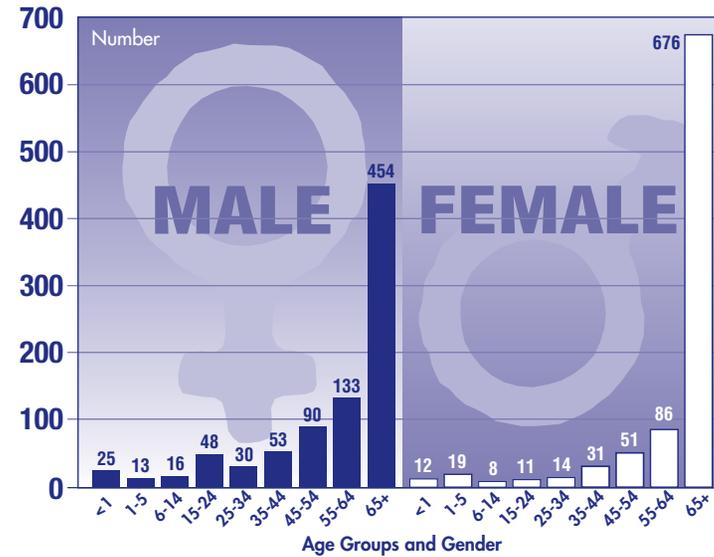


The leading cause of traumatic brain injury for blacks (36.5 percent) was motor vehicle traffic accidents. Accidental falls were the second leading cause of injury with 33.8 percent. The third leading cause of injury for blacks was homicide or violent injuries with 20.5 percent.

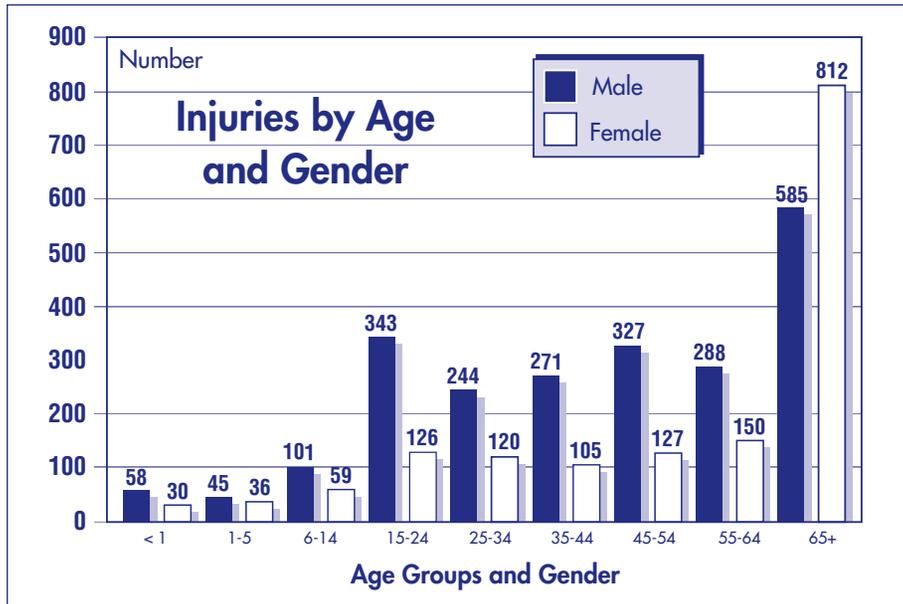
For all ages except 65 and older, males are more likely to incur a head injury than females. Falls accounted for 38.1 percent and motor vehicle traffic accidents 34.0

of the total injuries for males. Of the total injuries for females, falls accounted for 58.0 percent and motor vehicle traffic accidents 29.3 percent. At age 65 and older, females experienced more injuries due to falls and motor vehicle traffic accidents than males. Further analysis of the data revealed that 26.1 percent of the (88) patients less than one year of age sustained a brain injury due to homicide or an injury purposely inflicted by other persons.

## Falls by Age and Gender



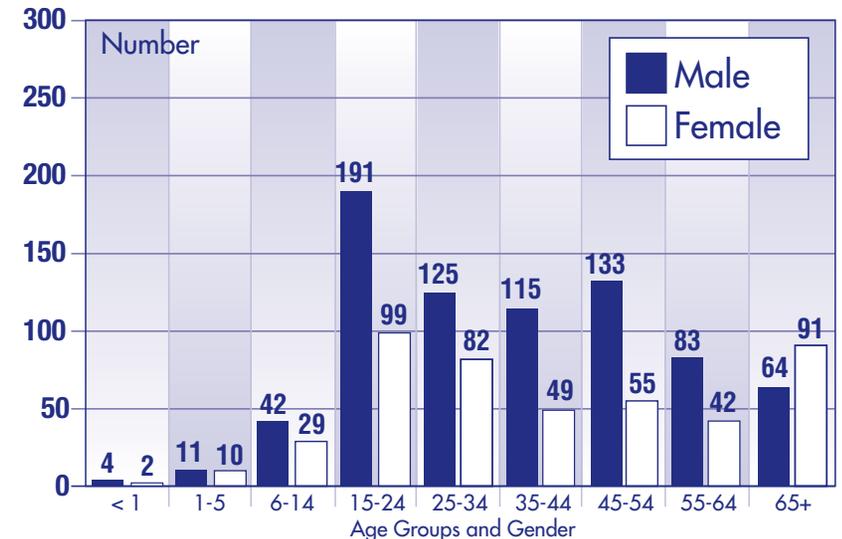
More males (768) than females (459) sustained a head injury due to a motor vehicle accident. More women than men 65 years old or over incurred a head injury due to a motor vehicle traffic accident. The highest percent of head injuries due to motor vehicle traffic accidents occurred in the 15 to 24 year old age group for both males (24.9) and females (21.6). Of the 343 males 15 to 24 years old, who sustained a head injury, 55.7 percent were due to a motor vehicle traffic accident. Of the 126 females 15 to 24 years old, who experienced a head injury, 78.6 percent were due to motor vehicle accidents.



Females in the 1 to 5 year old age group and 65 years or older experienced more fall related head injuries than males. Of the total traumatic brain injuries due to falls, 63.8 percent were from the age group 65 years and older. Of the 908 females who sustained a head injury due to a fall, 74.4 percent were 65 years and older, compared to 52.7 percent of the 862 males.

Work related accidents accounted for approximately 1.6 percent of the accidental fall head injuries.

## Motor Vehicle Traffic Crashes by Age and Gender



From January – June 2010, 132 motorcyclist and 11 motorcycle passengers experienced a head injury during a motor vehicle traffic accident. These motorcycle injuries were 11.7 percent of the total motor vehicle traffic accidents. Work-related accidents accounted for 1.4 percent of the total motor vehicle accidents. Of the total head injuries from motor vehicle traffic accidents, 5.1 percent resulted in a severe brain injury; 48.1 percent were classified as moderate; 42.1 percent were classified as mild; and the severity for 4.8 percent was undetermined.

When all cases were included, 26.2 percent of the individuals with severe brain injuries were hospitalized more than seven days, compared to 28.0 percent of the individuals with injuries considered to be moderate, and 13.8 percent for those with mild injuries. For cases where severity was undetermined, 12.6 percent were hospitalized more than seven days.

When individuals who died are excluded from the analysis, 89.8 percent of people with severe brain injuries were hospitalized more than seven days, while the percent of individuals with lesser injuries showed little change.

Of the cases with hospital stays of more than seven days, 71.1 percent were considered to have moderate brain injuries.

The length of stay could be affected by other injuries that occurred during the accident. The severity index by itself should not be used as a predictor or indicator of length of stay.

Severity of Injury by Length of Stay										
Length of Stay	Total	Died	Severe		Moderate		Mild		Undetermined	
			Total	Died	Total	Died	Total	Died	Total	Died
Less than 24 hrs.	114	114	57	57	25	25	16	16	16	16
1 Day	788	92	55	54	348	30	296	6	89	2
2 Days	616	38	19	18	318	18	207	1	72	1
3 Days	458	18	7	5	267	12	137	1	47	0
4 Days	356	19	8	8	215	9	101	2	32	0
5 Days	268	12	2	1	159	9	80	1	27	1
6 Days	201	4	0	0	134	4	47	0	20	0
7 Days	167	11	4	4	108	7	39	0	16	0
8 to 14 Days	456	42	16	7	320	31	86	2	34	2
15 to 21 Days	176	12	9	1	135	11	27	0	5	0
22 to 28 Days	86	5	9	0	60	3	15	1	2	1
29 Days or more	141	11	20	2	96	7	20	2	5	0
<b>TOTAL</b>	<b>3,827</b>	<b>378</b>	<b>206</b>	<b>157</b>	<b>2,185</b>	<b>166</b>	<b>1,071</b>	<b>32</b>	<b>365</b>	<b>23</b>

*Tennessee Traumatic Brain Injury Newsletter* was published by the Tennessee Department of Health, Division of Health Statistics  
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 Nashville, Tennessee 37243  
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