

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  
July-December

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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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July - December 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 and individuals who died from their brain injury. 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, 4,314 new TBI cases were identified and added to the registry from July – December 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 59.8 percent while 5.0 percent were considered “severe”. Another 26.0 percent of all TBI patients experienced a “mild” injury. Three hundred ninety-nine (399) cases, or 9.2 percent had an insufficient clinical description and the severity for these cases was “undetermined.”

Excluding the patients that died, 68.6 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 82.2 percent died. This category represents 42.2 percent of the total patients that died.

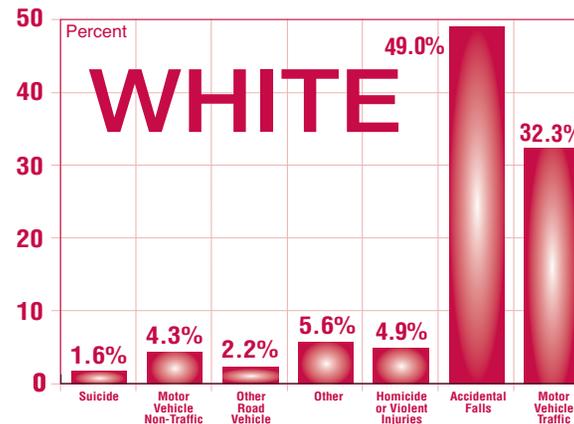
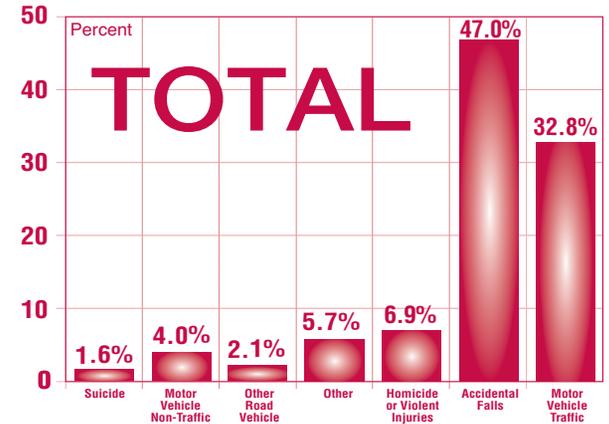
For patients with a “moderate” brain injury (excluding deaths) 63.8 percent were discharged for home care, which includes those requiring home health services and/or outpatient rehabilitation. Those discharged to a residential facility with skilled nursing staff, intermediate care facility or nursing home accounted for 15.6 percent, and 14.4 percent were discharged to an inpatient rehabilitation facility. Excluding deaths, 80.1 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.



Discharge Status	Total	Severe	Moderate	Mild	Undetermined
Transferred to acute care hospital	86	2	60	20	4
Home - self care or non-skilled assistance	2,382	7	1,325	822	228
Home - health services or outpatient rehab	292	2	191	65	34
Residential facility with skilled nursing	549	15	371	85	78
Inpatient rehab facility	448	8	341	79	20
Against medical advice	20	0	10	6	4
Correctional facility	26	1	14	7	4
Patient died	417	176	203	16	22
Other	94	3	63	23	5
Unknown	0	0	0	0	0
<b>Total</b>	<b>4,314</b>	<b>214</b>	<b>2,578</b>	<b>1,123</b>	<b>399</b>

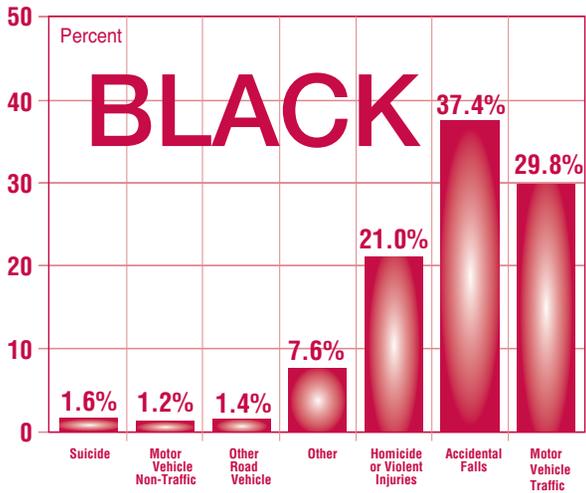
Identification of an external cause of injury permits the classification of environmental events, circumstances and the conditions as the cause of injury. An external cause of injury was reported for 96.8 percent (4,174) of the 4,314 persons treated in Tennessee. The data presented by race represents 3,544 white and 433 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. For the period of July through December 2010, falls continued to be the number one cause of traumatic brain injuries at 47.0 percent. Motor vehicle traffic accidents accounted for 32.8 percent. Homicide or violent injuries, including injury undetermined whether accidentally or purposely inflicted and legal intervention, accounted for 6.9 percent of the total injuries.



These figures include only cases with external cause of injury reported.

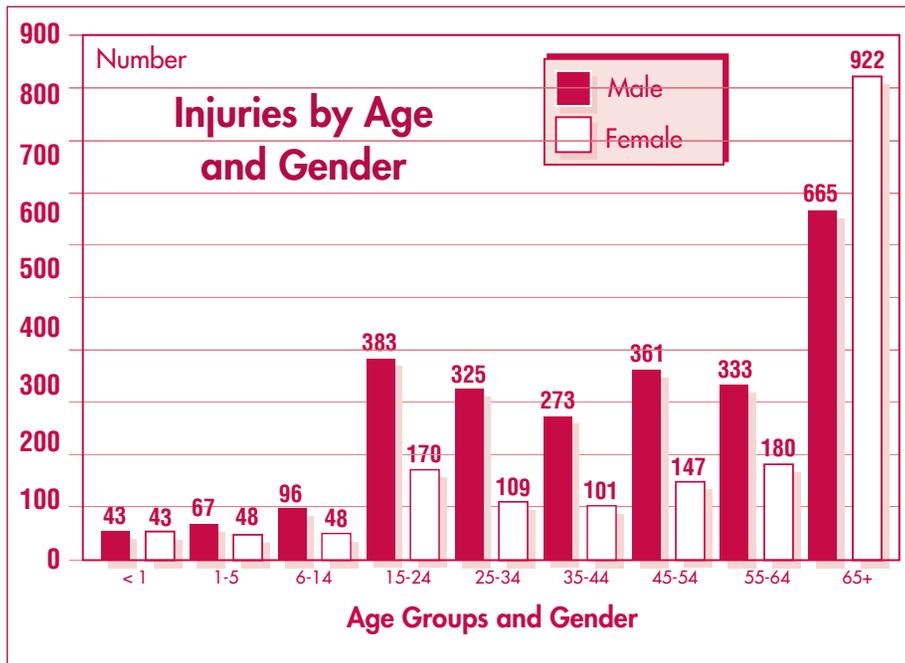
For whites, the leading cause of traumatic brain injury was accidental falls with 49.0 percent. The second leading cause of injury was motor vehicle traffic accidents with 32.3 percent. Other, which includes all causes of injury that do not fall under a category in the list, accounted for 5.6 percent of the total injuries.



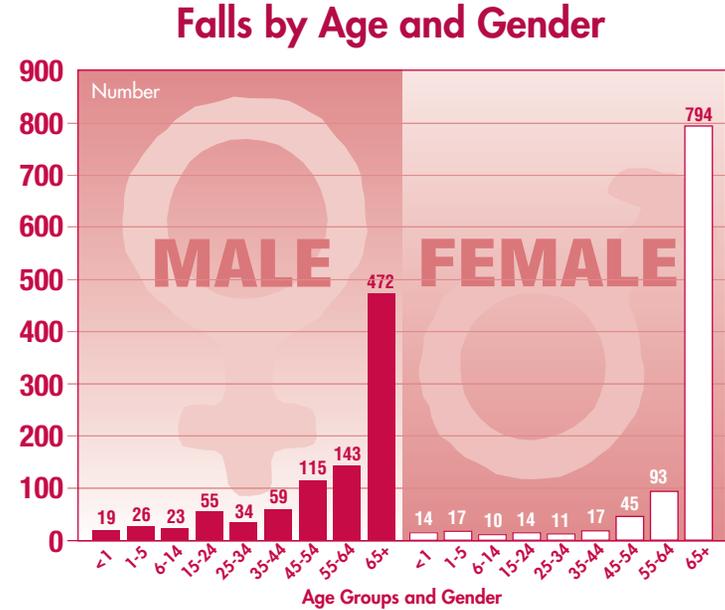
The leading cause of traumatic brain injury for blacks (37.4 percent) was accidental falls. Motor vehicle traffic accidents were the second leading cause of injury with 29.8 percent. The third leading cause of injury for blacks was homicide or violent injuries with 21.0 percent.

The same number of male (43) and female (43) infants experienced a head injury from July – December 2010. For all other ages except 65 and older, males are more likely to incur a head injury than females. Falls accounted for 37.2 percent and

motor vehicle traffic accidents 35.1 of the total injuries for males. Of the total injuries for females, falls accounted for 57.4 percent and motor vehicle traffic accidents 26.9 percent. Further analysis of the data revealed that 33.7 percent of the (86) patients less than one year of age sustained a brain injury due to homicide or an injury purposely inflicted by other persons.

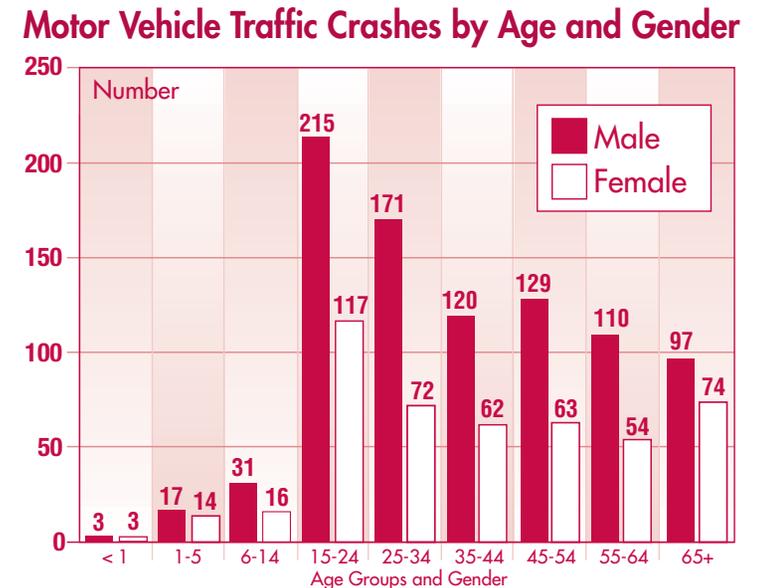


At age 65 and older, females experienced more injuries due to falls than males. Of the total traumatic brain injuries due to falls, 64.6 percent were from the age group 65 years and older. Of the 1,015 females who sustained a head injury due to a fall, 78.2 percent were 65 years and older, compared to 49.9 percent of the 946 males.



Approximately 1.8 percent of the head injuries due to accidental falls were work related.

More males (893) than females (475) sustained a head injury due to a motor vehicle 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 (24.1) and females (24.6). Of the 383 males 15 to 24 years old, who sustained a head injury, 56.1 percent were due to a motor vehicle traffic accident. Of the 170 females 15 to 24 years old, who experienced a head injury, 68.8 percent were due to motor vehicle accidents.



From July – December 2010, 187 motorcyclists and 12 motorcycle passengers experienced a head injury during a motor vehicle traffic accident. These motorcycle injuries were 14.5 percent of the total motor vehicle traffic accidents. Work-related accidents accounted for 1.3 percent of the total motor vehicle accidents. Of the total head injuries from motor vehicle traffic accidents, 5.6 percent resulted in a severe brain injury; 53.6 percent were classified as moderate; 35.8 percent were classified as mild; and the severity for 5.0 percent was undetermined.

When all cases were included, 22.0 percent of the individuals with severe brain injuries were hospitalized more than seven days, compared to 30.0 percent of the individuals with injuries considered to be moderate, and 16.5 percent for those with mild injuries. For cases where severity was undetermined, 13.3 percent were hospitalized more than seven days.

When individuals who died are excluded from the analysis, 84.2 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, 73.1 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.	122	95	53	53	52	25	6	6	11	11
1 Day	836	92	59	58	372	32	305	1	100	1
2 Days	647	42	16	16	356	25	194	1	81	0
3 Days	532	30	8	6	314	21	158	1	52	2
4 Days	405	31	14	13	244	17	105	1	42	0
5 Days	301	16	8	7	192	7	73	1	28	1
6 Days	254	15	5	4	160	10	67	0	22	1
7 Days	159	12	4	4	115	8	30	0	10	0
8 to 14 Days	552	49	16	9	389	36	114	2	33	2
15 to 21 Days	247	19	13	3	179	11	45	2	10	3
22 to 28 Days	114	7	4	1	99	5	8	0	3	1
29 Days or more	145	9	14	2	106	6	18	1	7	0
<b>TOTAL</b>	<b>4,314</b>	<b>417</b>	<b>214</b>	<b>176</b>	<b>2,578</b>	<b>203</b>	<b>1,123</b>	<b>16</b>	<b>399</b>	<b>22</b>

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