

Tennessee Department of Health
Traumatic Brain Injury Program
Clinical Services and Disease Management
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Nashville, Tennessee 37243

Tennessee Traumatic Brain Injury

2011
January - June

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.

Tennessee Department of Health
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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.

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, 3,941 new TBI cases were identified and added to the registry from January – June 2011.

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 56.8 percent while 4.6 percent were considered “severe”. Another 27.7 percent of all TBI patients experienced a “mild” injury. Four hundred thirty (430) cases, or 10.9 percent had an insufficient clinical description and the severity for these cases was “undetermined” (Table 1).

Excluding the patients that died, 69.4 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 77.2 percent died. This category represents 39.5 percent of the total patients that died (Table 2).

For patients with a “moderate” brain injury (excluding deaths) 63.2 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 16.0 percent, and 13.5 percent were discharged to an inpatient rehabilitation facility. Excluding deaths, 82.5 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 (Table 2).

Table 1. Injuries by Severity

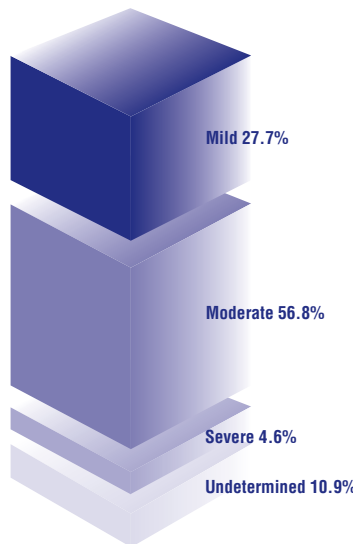


Table 2. Hospital Discharge Status by Severity of Injury

Discharge Status	Total	Severe	Moderate	Mild	Undetermined
Transferred to acute care hospital	97	1	59	24	13
Home - self care or non-skilled assistance	2,184	18	1,132	806	228
Home - health services or outpatient rehab	307	0	175	85	47
Residential facility with skilled nursing	507	12	330	79	86
Inpatient rehab facility	359	5	280	56	18
Against medical advice	18	1	12	5	0
Correctional Facility	21	1	10	9	1
Patient died	352	139	172	12	29
Other	96	3	69	16	8
Total	3,941	180	2,239	1,092	430

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 97.5 percent (3,844) of the 3,941 persons treated in Tennessee. The data presented by race represents 3,290 white and 420 black cases.

For the period of January through June 2011, falls continued to be the number one cause of traumatic brain injuries at 50.2 percent. Motor vehicle traffic accidents accounted for 28.9 percent. Other, which includes all

Table 3. External Cause of Injury by Percent - Total

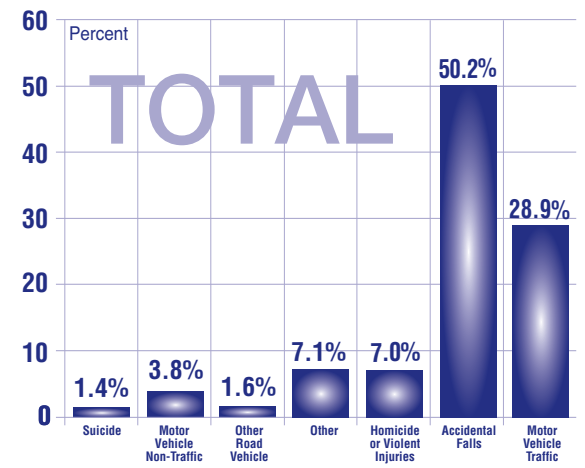
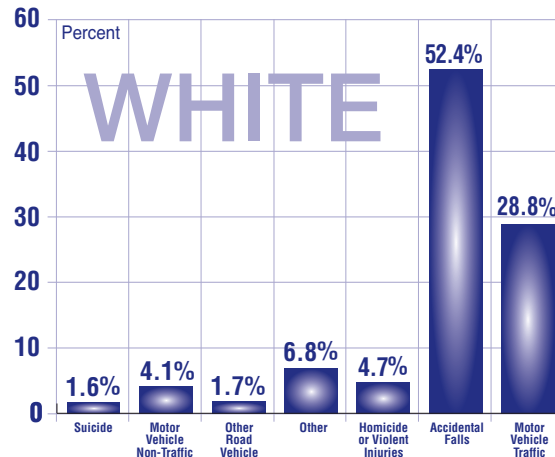


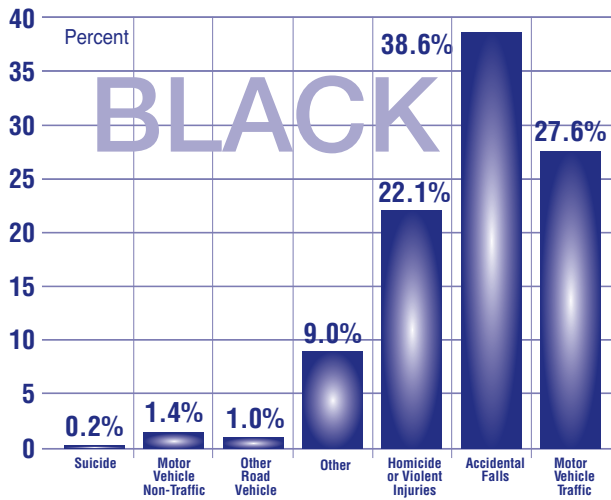
Table 4. External Cause of Injury by Percent - White



causes of injury that do not fall under a category in the list, accounted for 7.1 percent of the total injuries. These figures include only cases with external cause of injury reported (Table 3).

For whites, the leading cause of traumatic brain injury was accidental falls with 52.4 percent. The second leading cause of injury was motor vehicle traffic accidents with 28.8 percent. Other, which includes all causes of injury that do not fall under a category in the list, accounted for 6.8 percent of the total injuries (Table 4).

Table 5. External Cause of Injury by Percent - Black

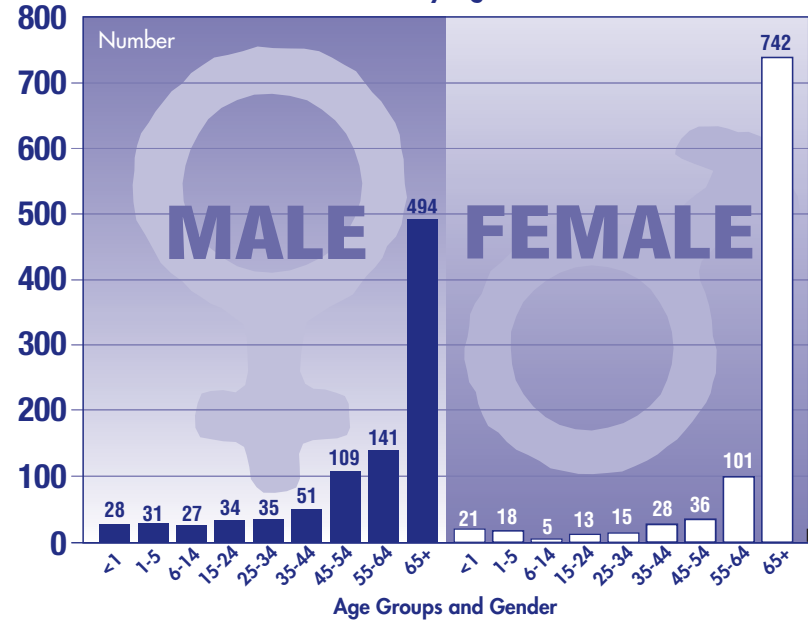


The leading cause of traumatic brain injury for blacks (38.6 percent) was accidental falls. Motor vehicle traffic accidents were the second leading cause of injury with 27.6 percent. The third leading cause of injury for blacks was homicide or violent injuries with 22.1 percent (Table 5).

For all age groups except 65 and older, males are more likely to incur a head injury than females. Falls accounted for 40.5 percent and motor vehicle traffic accidents 30.8 percent of the total injuries for males. Of the total injuries for females, falls accounted for

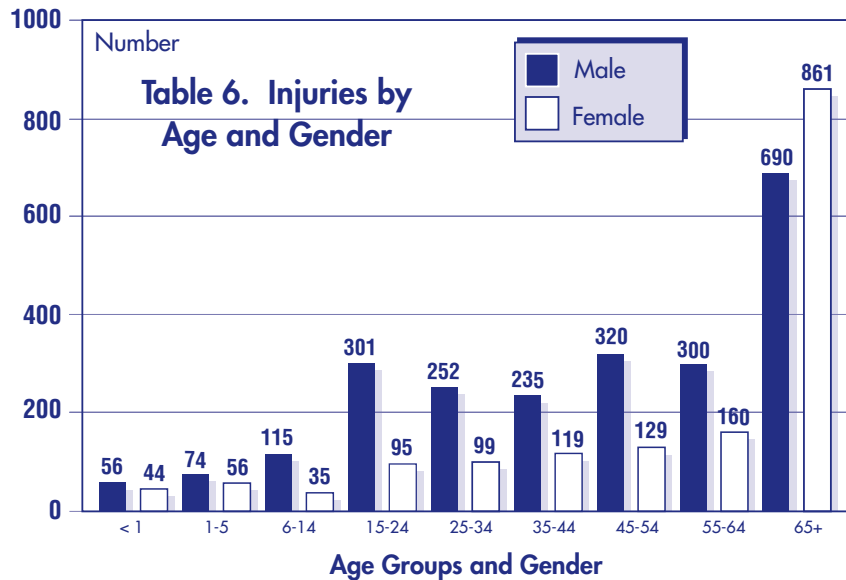
61.3 percent and motor vehicle traffic accidents 24.3 percent. Further analysis of the data revealed that 18.0 percent of the (100) patients less than one year of age sustained a brain injury due to homicide or an injury purposely inflicted by other persons (Table 6).

Table 7. Falls by Age and Gender



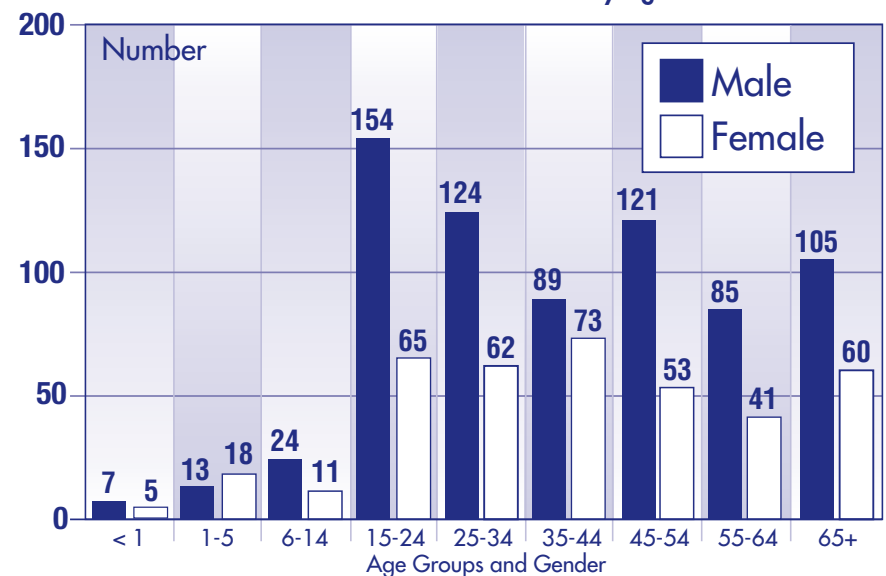
More males (722) than females (388) sustained a head injury due to a motor vehicle accident. The highest percent of head injuries due to motor vehicle traffic accidents occurred in the 15 to 24 year old age group for males (21.3) and the 35 to 44 year old age group for females (18.8). Of the 301 males 15 to 24 years old, who sustained a head injury, 51.2 percent were due to a motor vehicle traffic accident. Of the 95 females 15 to 24 years old, who experienced a head injury, 68.4 percent were due to motor vehicle accidents (Table 8).

Table 6. Injuries by Age and Gender



At age 65 and older, females experienced more injuries due to falls than males. Of the total traumatic brain injuries due to falls, 64.1 percent were from the age group 65 years and older. Of the 979 females who sustained a head injury due to a fall, 75.8 percent were 65 years and older, compared to 52.0 percent of the 950 males. Approximately 1.5 percent of the head injuries due to accidental falls were work related (Table 7).

Table 8. Motor Vehicle Traffic Crashes by Age and Gender



From January – June 2011, 122 motorcyclists and 9 motorcycle passengers experienced a head injury during a motor vehicle traffic accident. These motorcycle injuries were 11.8 percent of the total motor vehicle traffic accidents. Work-related accidents accounted for 1.1 percent of the total motor vehicle accidents. Of the total head injuries from motor vehicle traffic accidents, 4.5 percent resulted in a severe brain injury; 49.6 percent were classified as moderate; 39.9 percent were classified as mild; and the severity for 5.9 percent was undetermined (Table 8).

When all cases were included, 27.8 percent of the individuals with severe brain injuries were hospitalized more than seven days, compared to 28.6 percent of the individuals with injuries considered to be moderate, and 13.4 percent for those with mild injuries. For cases where severity was undetermined, 13.0 percent were hospitalized more than seven days.

When individuals who died are excluded from the analysis, 75.6 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 total cases with hospital stays of more than seven days, 71.7 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 (Table 9).

Table 9. 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.	190	85	44	42	65	23	60	3	21	17
1 Day	760	74	35	31	333	35	308	2	84	6
2 Days	599	32	17	15	326	15	169	0	87	2
3 Days	502	21	10	9	268	12	150	0	74	0
4 Days	333	20	14	13	195	4	93	1	31	2
5 Days	286	17	6	6	182	11	68	0	30	0
6 Days	214	14	2	2	130	12	58	0	24	0
7 Days	165	12	2	2	100	8	40	1	23	1
8 to 14 Days	475	50	18	14	329	31	93	4	35	1
15 to 21 Days	180	12	8	2	139	9	24	1	9	0
22 to 28 Days	94	7	8	2	67	5	13	0	6	0
29 Days or more	143	8	16	1	105	7	16	0	6	0
TOTAL	3,941	352	180	139	2,239	172	1,092	12	430	29

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