

Division of Public Health
Department of Health
and Social Services

A traumatic brain injury (TBI) is defined as a blow or jolt to the head, or a penetrating head injury that disrupts the normal functioning of the brain.

The vast majority of TBI hospitalizations were the result of unintentional injuries.

Falls were the leading cause of TBI-related hospital stays.

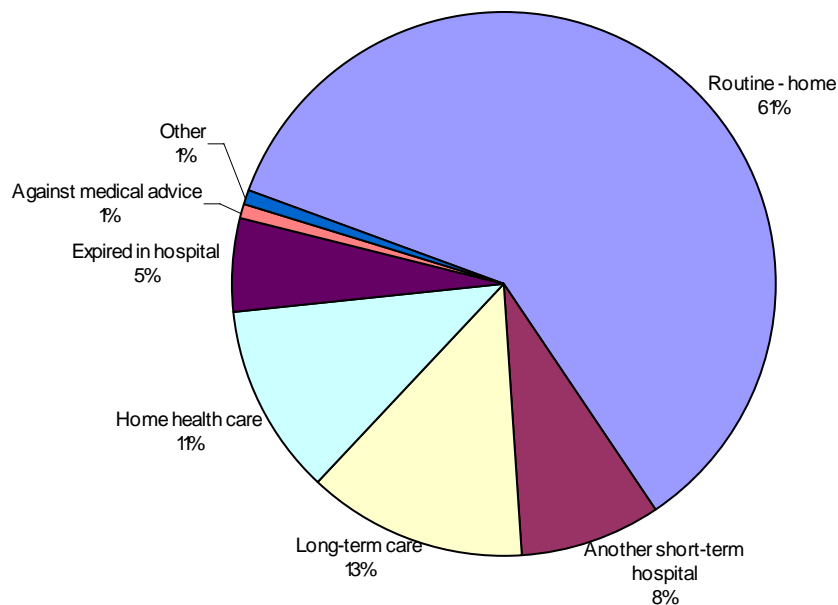
Traumatic Brain Injury Hospitalizations in Delaware

According to the CDC, TBIs are the type of injury most likely to cause death or permanent disability. Approximately 1.4 million TBIs occur each year, resulting in 235,000 hospitalizations and 50,000 deaths¹. Those TBIs requiring hospitalization are generally more severe and carry higher risks of serious and long-term complications.

To assess the impact of TBIs in Delaware, inpatient hospital discharge data from the state's acute-care hospitals were analyzed. From 2003 to 2007, there were 4,847 TBI-related hospital stays of Delaware residents, resulting in a five-year age-adjusted rate of 113 discharges per 100,000 population and a total hospital bill of \$120.9 million. Nearly all of these patients were admitted through the emergency department (ED), and they spent an average of 7 days in the hospital, for a median bill of \$11,252 per stay.

The majority of patients hospitalized for a TBI were discharged home, 11 percent were discharged under the care of a home health services organization, 8 percent were sent to another hospital, 13 percent went to a long-term care or similar facility, and 5 percent of patients admitted for a TBI died in the hospital, versus 2.4 percent of all non-TBI patients.

Figure 1. TBI Patient Disposition Status, Delaware Hospitals, 2003-2007



Source: Delaware Health Statistics Center

Patient Characteristics in 2003-2007

New Castle County residents had the highest TBI discharge rate at 125.8 per 100,000 population, followed by Kent and Sussex counties, at 106.4 and 87.1 discharges per 100,000.

Over half of all patients hospitalized for a TBI-related injury were males.

The race distribution of TBI patients was similar to that of the general population; white patients accounted for 73 percent of all TBI hospitalizations, while black patients made up 18 percent of the discharges.

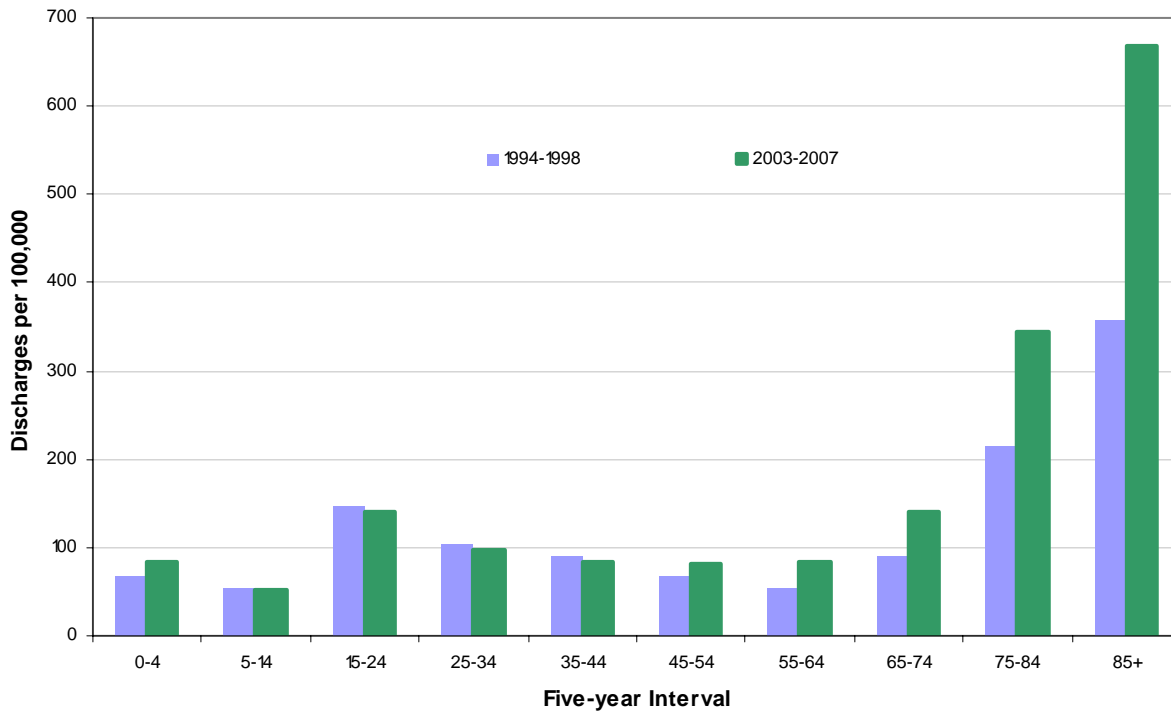
As would be expected of an injury diagnosis, nearly all (94 percent) TBI associated hospitalizations were admitted from the emergency department.

Eleven percent of all hospital stays were children 0-14; teens and young adults ages 15-24 accounted for 17 percent of all stays, while older adults 65 and over accounted for 33 percent of all stays.

The highest TBI hospitalization rates occurred among adults in the 75-84 and 85 and older age groups, at 344 and 669 discharges per 100,000 population

From 1994-1998 to 2003-2007 in Delaware, TBI hospitalization rates increased for patients 0-4 and those 45 and older. The largest rate increases occurred in the 75-84 and 85+ age groups.

Figure 2. Five-year TBI Hospital Discharge Rates of Delaware Residents by Age Group Delaware Hospitals, 1994-1998 and 2003-2007



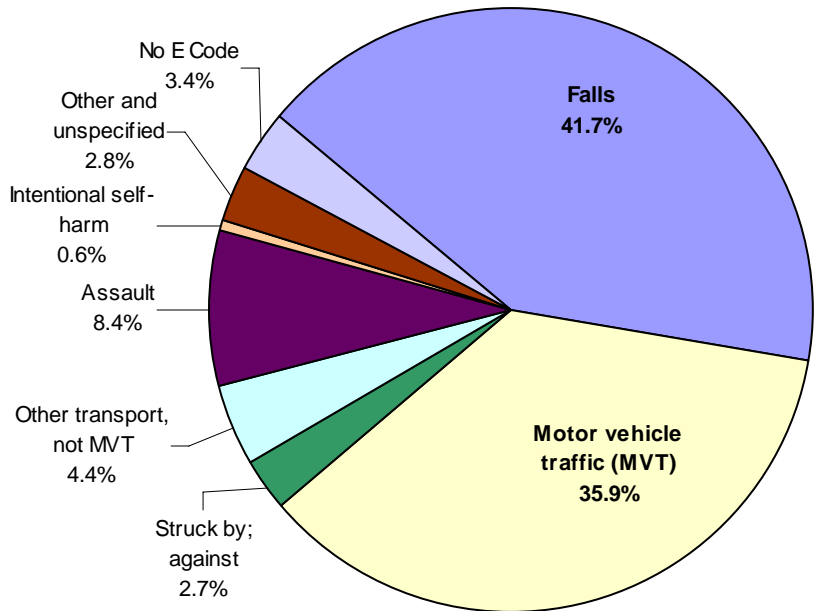
Notes:

Each hospital discharge record has one primary and up to eight secondary diagnoses. TBI-related discharges were identified if any one of the 9 diagnosis fields contained the set of ICD-9-CM (International Classification of Diseases, Ninth Revision, Clinical Modification) codes for TBI, as established by the Center for Disease Control's National Center for Injury Prevention and Control².

Source: Delaware Health Statistics Center

Figure 3. Percent of TBI-Related Hospitalizations by External Cause Delaware, 2003-2007

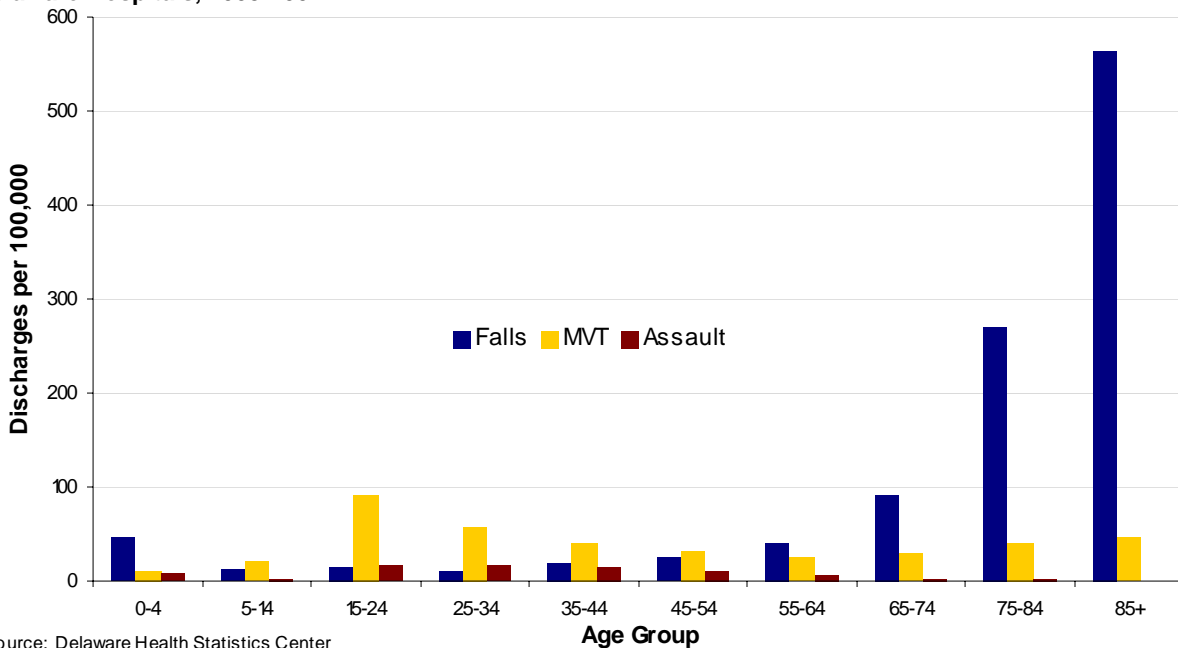
Falls, motor vehicle traffic crashes, and assault were the leading causes of TBIs in 2003-2007. Together, these three external causes comprised 86 percent of all TBI-related hospital stays. Other transport accidents, which include pedal cyclist and pedestrian injuries, accounted for 4 percent. Unintentional struck by/against injuries, which result from being struck accidentally by a falling object, striking against, or being struck accidentally by an object or person, were responsible for 3 percent of all TBIs.



Source: Delaware Health Statistics Center

The rate of fall-related TBIs was highest among adults 65 and older; rates doubled with each increase in age group, beginning with patients 55-64. The 15-24 age group had the highest rates of motor vehicle traffic-related TBIs, while those age groups between 15 and 34 had the highest rates of assault-related TBIs.

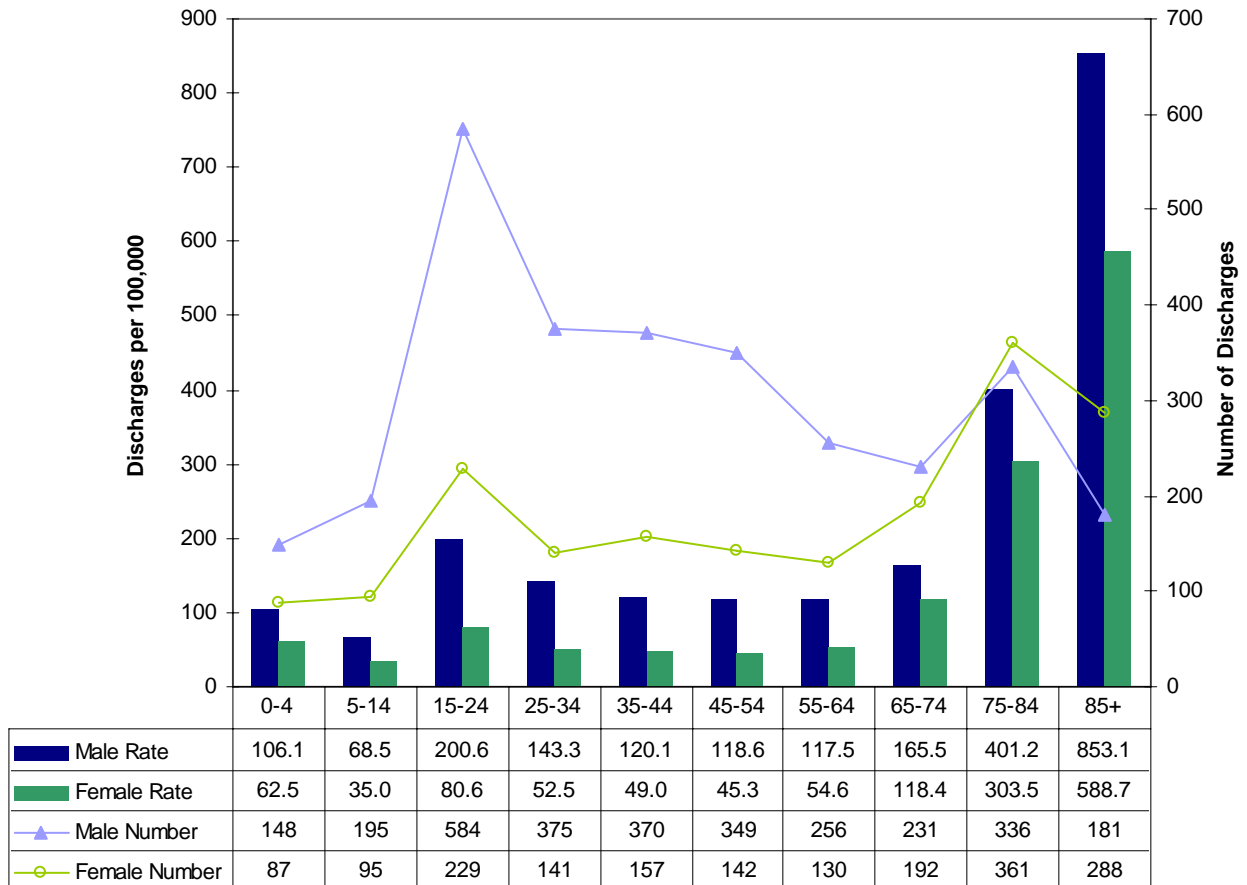
Figure 4. Five-year TBI-Related Hospitalization Rates by External Cause and Age Group Delaware Hospitals, 2003-2007



Source: Delaware Health Statistics Center

Males accounted for 62 percent of TBI associated discharges. TBI hospitalization rates for males were nearly twice that of females; the largest differences were in the 25-34 and 45-54 age groups where the male to female ratios were 2.7 and 2.6.

Figure 5. Five-year TBI Hospital Discharge Frequencies and Rates of Delaware Residents by Age Group and Gender, Delaware Hospitals, 2003-2007



Source: Delaware Health Statistics Center

References:

1. **Facts about Traumatic Brain Injury.** Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Available from: http://www.cdc.gov/ncipc/tbi/FactSheets/Facts_About_TBI.pdf. Accessed on: 9/3/2008.
2. Injury Surveillance Workgroup. **Consensus Recommendations for Using Hospital Discharge Data for Injury Surveillance.** Marietta (GA): State and Territorial Injury Prevention Directors Association; 2003.
3. Johnson RL, Thomas KE, Sarmiento K. **State Injury Indicators: Instructions for Preparing 2005 Data.** Atlanta (GA): Centers for Disease Control and Prevention, National Center for Injury Prevention and Control; 2007.
4. Langlois JA, Rutland-Brown W, Thomas KE. **Traumatic Brain Injury in the United States: Emergency Department Visits, Hospitalizations, and Deaths.** Centers for Disease Control and Prevention, National Center for Injury Prevention and Control; 2006.
5. Johnson RL, Thomas RG, Thomas EK, Patel N, Sarmiento K. **State Injury Indicators Report, Third Edition—2004 Data.** Atlanta (GA): Centers for Disease Control and Prevention, National Center for Injury Prevention and Control; 2007.



DELAWARE HEALTH AND SOCIAL SERVICES

Division of Public Health

If you have comments, suggestions, and/or questions, please contact the Delaware Health Statistics Center at (302) 744-4541.

Reported by Barbara Gladders