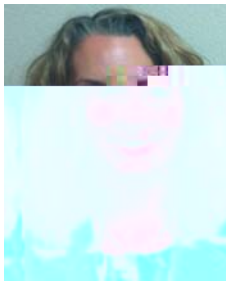
THE INSURANCE IMPLICATIONS OF TRAUMATIC BRAIN INJURY



[illegible], MSA, ACAS, MAAA
jcallaway@rgare.com

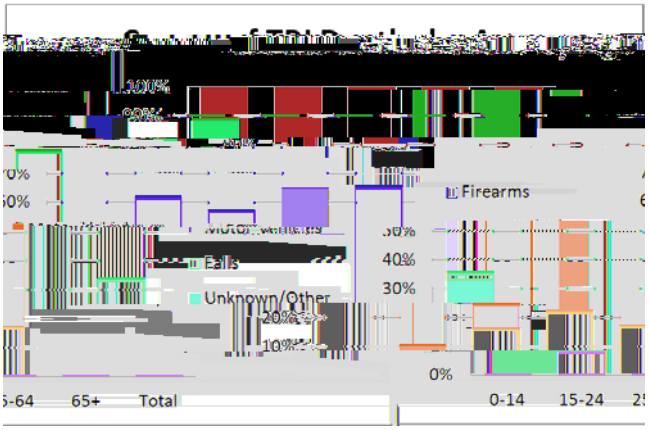
Michael Hill, FALU, FLMI, ARA, ACS
Senior Underwriting Consultant
RGA Reinsurance Company
Chesterfield, MO
mhill@rgare.com

Executive Summary

Figure 1

Source: [2]

Figure 2



Source: [4]

cling accident. Children should wear an appropriate helmet any time they are on a motorcycle, bicycle, skateboard, snowmobile, scooter, skates or an all-terrain vehicle.[4] The rate of injury from sports and recreation activity varies by age and gender. The most common activity resulting in a traumatic brain injury in 10- to 19-year-old US boys is football, while playground accidents are the cause of the most TBIs in all children under age 4. The chart at right [Figure 3] shows the five most common activities for boys and girls under age 19 resulting in a TBI-related ER visit. These activities in total account for over 60% of all TBI-related ER visits for children.[7]

The remaining 39% of annual emergency room TBI visits for children are due to a wide range of various other causes, each accounting for 0.1-4% of ER visits.

Each year, more than 300,000 people experience a sports-related TBI.[8] Use of protective equipment and adopting safety measures can minimize the number and severity of sports-related injuries. When a head injury has occurred, it is imperative that the symptoms are recognized and the player is removed from a game. Evaluation should consider concussion history because it can affect the severity and duration of symptoms. A player should only return to play after all symptoms have resolved and an evaluation with an experienced healthcare provider has determined it is safe for the player to return to the game. By

increasing awareness of TBI risks from sports and recreation, employing proper technique and protective equipment, and quickly responding to injuries, the incidence, severity and long-term negative health effects of TBIs among athletes can be reduced.[7]

Occupational injuries also pose a risk for traumatic brain injury. It is estimated that 20% of workplace traumatic brain injuries are caused by slips and falls.[9] Additionally, workers over the age of 65 are the most at risk to experience a fatal TBI. The occupations with

Males account for the majority of traumatic brain injuries in the US.[2] However, in sports in which both genders participate, women have a higher rate of injury.[20] Additionally, women have a longer recovery time than men. Studies have shown that women take longer for symptoms to resolve and are more likely to experience long-term cognitive difficulties.[11]

Concussion history also affects recovery. People with prior concussions take longer to recover and experience more severe symptoms compared with those without prior concussions. Additionally, a study that compared athletes without a history of concussion with those that had three or more previous concussions found that those with a history of concussion were 7.7 times more likely to have a drop in memory abilities a few days after a concussion.[21] Athletes with a history of concussions are more likely to experience a prolonged length of recovery as well as an increased likelihood of experiencing a subsequent concussion.[22]

Trends

Over the period from 1997 to 2007, the average annual death rate associated with TBIs declined by 8.2%, from 19.2 to 18.1 per 100,000 population. The TBI death rate decreased over this period for all causes of injury except falls. However, the overall decline was not consistent by age group. While TBI-related death rates decreased over 25% for people under age 25, they increased by 14% for older adults over age 65. This increase was especially high for those over age 85.[4]

While TBI-related deaths declined in recent years, especially for youth, the number of TBI-related ER visits for children related to sports and recreation accidents increased. From 2001 to 2007, the annual number of non-fatal sports and recreation TBI ER visits for children under age 20 increased 20%; the annual number of visits increased by more than 60% when comparing 2001 to 2009. Interestingly, the overall number of sports-related ER visits for children under age 20 from all types of injury declined from 2001 to 2009. In 2001, just over 5% of children seen in the ER for sports-related injuries had experienced a TBI; by 2009 that number had increased to almost 10%.[7] Also, over the same period, the annual number of deaths from TBI for children under age 20 declined by 18%.[4]

Additionally, from 2005 to 2009, the overall annual number of adolescents, aged 10-19, hospitalized due 1gro7ncreased by more thad 205. Teh rates of

Researchers are investigating the relationship between repeated head trauma and neurodegenerative diseases. Many people who experience multiple concussions develop diseases such as Alzheimer's, Parkinson's and ALS later in life. In a recent study, autopsies were conducted on brains of 85 people who had experienced repeated mild TBI. The study found that 80% of these people showed signs of chronic traumatic encephalopathy, (CTE).[25] Therefore, there is some evidence that suggests repeated minor impacts may have long-term neurological consequences.

On April 2, 2013, US President Barack Obama announced plans for an initiative, Brain Research through Advancing Innovative Neurotechnologies (BRAIN). The ultimate goal of the initiative is to identify ways to better understand neurological and psychiatric disorders in order to treat, cure and, perhaps, prevent brain disorders such as Alzheimer's disease, Parkinson's disease and traumatic brain injury.[26]

Insurance Implications

Millions of Americans experience traumatic brain injuries each year. While most expect a full recovery, many will experience long-term sequelae from their injury. Because the causes of TBI are diverse and affect people of all ages, the insurance implications of traumatic brain injury are far-reaching. While the numbers of deaths and hospitalizations have decreased in recent years, traumatic brain injuries continue to have significant implications for multiple product lines within the insurance industry. Life insurance and accidental death products are exposed to the 52,000 Americans who die annually as a direct result of a TBI. Further, some people who survive a traumatic brain injury may have a shortened life expectancy, thus resulting in an increase in mortality experience. Similarly, people who experience a TBI may have increased morbidity, impacting products such as long-term care, disability and critical illness.

Various occupations and avocations may be worth considering in the underwriting process, given the increased exposure risk involving specific activities. When underwriting a risk with a history of traumatic brain injury, the most important prognostic factors include age, mechanism of injury, post-resuscitation GCS (Glasgow Coma Scale) score, post-resuscitation pupillary reactivity, post-resuscitation blood pressures, intracranial pressures, duration of post-traumatic amnesia or confusion, sitting balance and intracranial pathology identified on neuroimaging.[27]

Although TBI currently represents a considerable risk to the insurance industry, increased public awareness, combined with the advancement of technology and research, will play a vital role in mitigating the risk of traumatic brain injuries in the future.

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