

# Traumatic Brain Injury (TBI)– Data Brief

## Vermont Vital Statistics & Hospital Discharge Data

### Background

Traumatic Brain Injury (TBI) is caused by a bump, blow, jolt, or penetrating head injury that disrupts the normal function of the brain<sup>1</sup>. TBI has multiple causes (including firearms, motor vehicle traffic, falls, etc.) and multiple descriptions (including: open head wound, fracture of skull and facial bones, etc.). The severity of TBIs are difficult to determine in surveillance definitions. This data brief examines all causes, including contributing causes, of death related to TBI.

### TBI Mortality

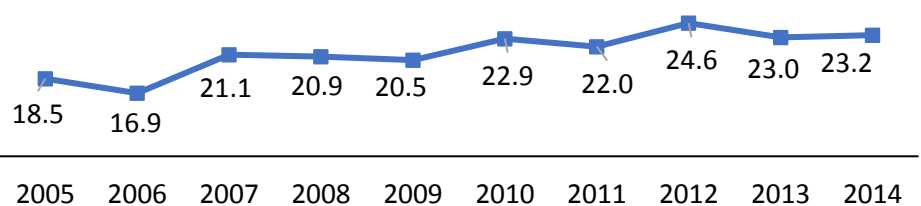
#### Primary Cause of TBI Death

Of the 815 TBI-related deaths from 2010-2014, all had a cause other than TBI listed as the primary cause of death. Of these, a third (35%) were due to firearms, three in ten (31%) were due to falls, and a quarter (24%) were due to motor vehicle traffic crashes. The remainder (10%) were made up of a variety of causes, each less than 2%, including drowning, machinery and being struck.

#### Trend

The rate of TBI related deaths among Vermont residents increased from 18.5 per 100,000 people in 2005 to 23.2 per 100,000 people in 2014. This increase was not statistically significant.

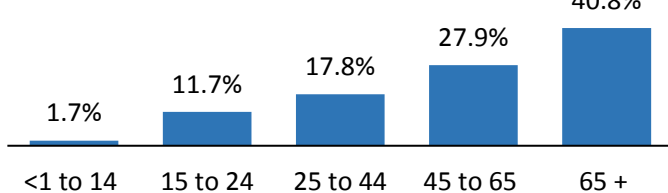
TBI- related Deaths rate among Vermont Residents, 2010-2014



#### TBI Mortality Intent

More than six in ten (62%) of TBI-related deaths were unintentional. About four in ten (38%) were intentional (34% suicide, and 3% homicide), and 1% was of undetermined intent. About 50% of deaths in all age groups are unintentional, the exception being those 65+ where nearly 80% are unintentional. Additionally, among those <1-14, 30% of TBI related deaths are the result of suicides.

Age Distribution of TBI-related Deaths among Vermont Residents, 2010-2014



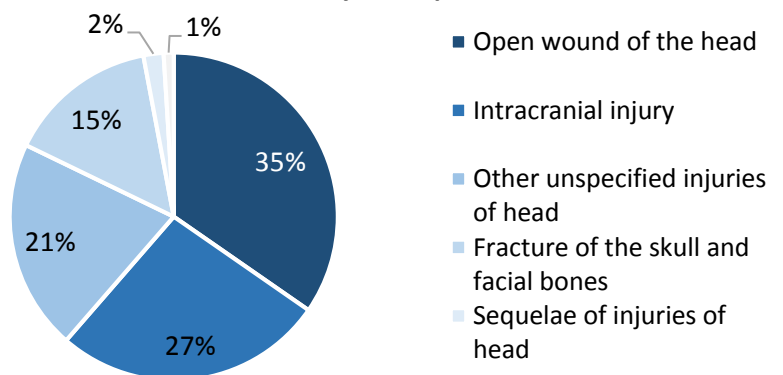
#### Sex & Age

From 2010-2014, three quarters (73%) of TBI-related deaths were among men compared to 27% among women. As age increases so does the likelihood of dying from a TBI-related cause. The highest percentage of TBI-related deaths were among those over the age of 65 (41%) and the lowest were among those under 15 years of age (2%).

#### TBI Mortality by Description

Over a third (35%) of TBI-related deaths were due to an open wound of the head, while about a quarter (27%) were due to intracranial injury. Two in ten (21%) resulted from unspecified injuries of the head (unspecified injuries of the face, ear or nose and injuries classifiable to more than one of the other descriptions) and 15% were due to fracture of skull and facial bones. Few were due to other TBI.

TBI-related deaths, by description 2010-2014



<sup>1</sup> Basic Information about Traumatic Brain Injury and Concussion. CDC. <https://www.cdc.gov/traumaticbraininjury/basics.html>

## TBI Morbidity

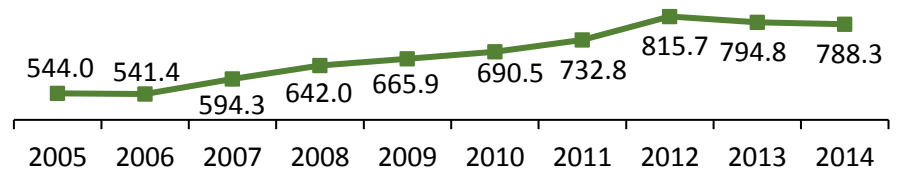
### Primary Cause of TBI Morbidity

From 2010-2014, nearly all (96%) TBI hospitalizations and ED visits also have an injury listed. Of these, 54% were due to falls, 22% were due to being struck by/against, 12% were due to motor vehicle traffic accidents, and 12% were related to some other type of injury.

### Trend

The rate of TBI related deaths among Vermont residents at Vermont hospitals increased significantly from 544.0 per 100,000 people in 2005 to 788.3 per 100,000 people in 2014.

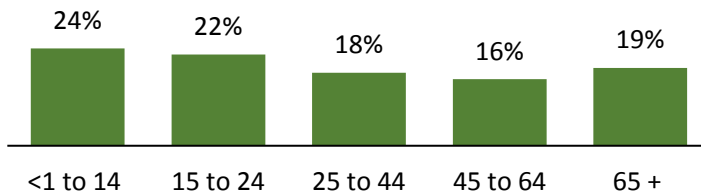
**TBI-related Hospitalizations & ED Visit rate  
VT Residents at VT Hospitals, 2010-2014**



### TBI Morbidity Intent

From 2010-2014, more than nine in ten (94%) of TBI-related Hospitalizations and ED Visits were unintentional. Six percent were intentional (<1% self-harm, and 6% assault).

**Age Distribution of TBI-related  
Hospitalizations and ED Visits  
VT Residents at VT Hospitals, 2010-2014**



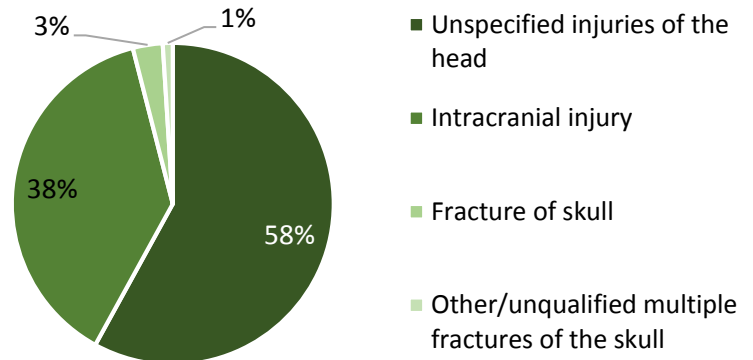
### Sex & Age

More than half (52%) of TBI-related hospitalizations and ED visits were among men, with 48% among women. TBI-related hospitalizations and ED visits were highest among those under age 15 (24%). The proportion decreases significantly through age 64, before increasing among those 65 and older (19%).

### TBI Morbidity by Description

Nearly six in ten (58%) TBI-related hospitalizations and ED visits were due to unspecified injuries of the head. About four in ten (38%) were due to intracranial injuries, including concussion, contusion, laceration and hemorrhage. Few, less than five percent were due to fractures of skull (3%), other/unqualified multiple fractures of the skull (1%), shaken baby syndrome (<1%), and injuries to the optic nerve and pathways (<1%).<sup>2</sup>

**TBI-related Hospitalization/ED Visits  
by description 2010-2014**



## Summary

The cause of the decrease in TBI-related deaths and increase in hospitalizations/ED visits is unclear, however, this pattern is similar to the US<sup>3</sup>. Decreases in fatal motor vehicle traffic crashes, increases in fall-related deaths<sup>4</sup>, as well as increased awareness around TBI injuries are all possible factors in the changes to the morbidity and mortality trends<sup>5</sup>.

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<sup>2</sup> This analysis is of the first listed cause of TBI. Few (224) people had multiple causes listed.

<sup>3</sup> Rates of TBI-related Emergency Department Visits, Hospitalizations, and Deaths — United States, 2001–2010. CDC. <https://www.cdc.gov/traumaticbraininjury/data/rates.html>

<sup>4</sup> [http://www.healthvermont.gov/sites/default/files/documents/2017/02/HSVR\\_Injury\\_Mortality.pdf](http://www.healthvermont.gov/sites/default/files/documents/2017/02/HSVR_Injury_Mortality.pdf)

<sup>5</sup> [https://www.cdc.gov/mmwr/volumes/66/ss/ss6609a1.htm?s\\_cid=ss6609a1\\_w](https://www.cdc.gov/mmwr/volumes/66/ss/ss6609a1.htm?s_cid=ss6609a1_w)