



# Hawaii

## Special Emphasis Report: Traumatic Brain Injury, 2010-2014

### Understanding TBI

Traumatic brain injury (TBI) is a serious public health problem and in the United States. A TBI is caused by a bump, blow, jolt, or penetration to the head that disrupts the normal function of the brain. Each year, traumatic brain injuries contribute to a substantial number of deaths and cases of permanent disability.

### Impact and Magnitude of TBI

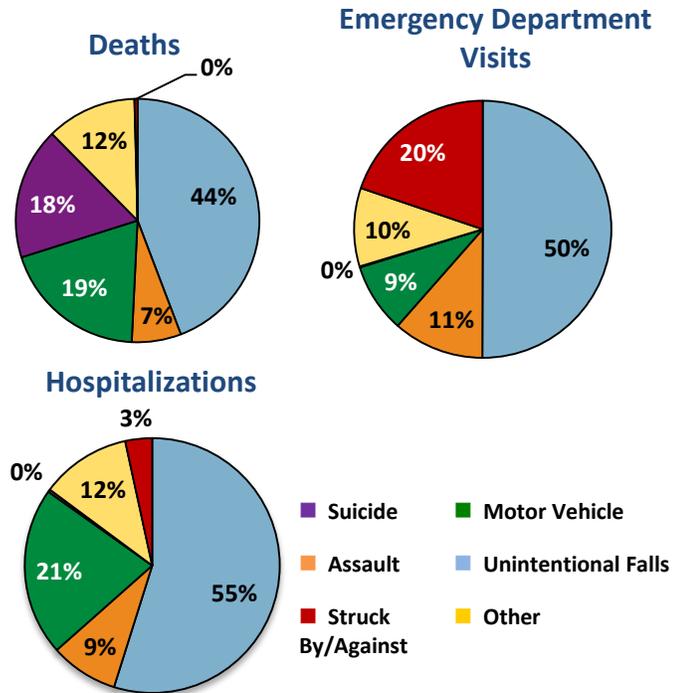
During 2010-2014, an average of 11,588 Hawaii residents sustained a TBI annually. Among those injured, 195 (12.4 per 100,000 residents) died where TBI was reported as a cause of death on the death certificate alone or in combination with other injuries or conditions. Another 1,227 (79.2 per 100,000), were hospitalized with a TBI, and an additional 10,167 (734.2 per 100,000) were treated and released from emergency departments (ED) with a TBI alone or in combination with other injuries or conditions. An unknown number of individuals sustained injuries that were treated in other settings or went untreated.

### Causes of TBI

Unintentional falls was the leading cause of TBI at each level of severity, accounting for more than half of the nonfatal injuries and 44% of deaths that involved a TBI. Most of the fatal falls (79%) and those requiring hospitalization (69%) occurred among senior-aged residents (those 65 years and older), while patients under 15 years of age comprised 36% of the fall-related TBI treated in ED settings. Motor vehicle crashes were common causes of fatalities and hospitalizations, while being unintentionally struck by or against something were a more prevalent cause of TBI-related ED visits. The average duration for hospitalizations was nearly 7 days and resulted in approximately \$43,230 in medical charges (\$53 million/year). Each TBI-related ED visit generated almost \$3,000 in medical charges (a total of \$30.3 million/year).

**Data sources:** Mortality data is from the death certificate database of the Hawaii Department of Health. Data on ED visits and hospitalizations is from the Hawaii Health Information Corporation (HHIC). Only HHIC records with an injury-related principal diagnosis were included. Records of patients who died in the hospital or who were transferred to another hospital were excluded.

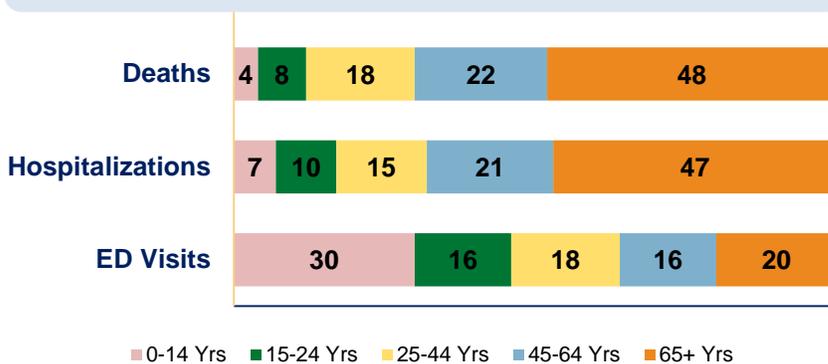
**Figure 1: Percentage of Annual TBI-Related Deaths, Hospitalizations, and Emergency Department Visits, by External Cause, in Hawaii, 2010-2014**



### TBI by Age

Nearly half of the TBI-related fatalities (48%) and hospitalizations (47%) occurred among residents 65 years of age or older. Patient age was more widely distributed among those treated in ED settings, as nearly one-third (30%) were under 15 years of age. Residents aged 75 years and older also had the highest rates of TBI-related deaths and hospitalizations, while those under 5 years of age had the highest rates of TBI-related ED visits.

**Figure 2: Percentage of Annual TBI-Related Deaths, Hospitalizations, and Emergency Department Visits, by Age, in Hawaii, 2010-2014**



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### TBI by Gender

Men were more likely to sustain a traumatic brain injury than women. The magnitude of this difference was greatest among those who died (70% were males) and those who were hospitalized (62% males). Among senior-age residents, however, women comprised a slight majority (55%) of hospitalized patients, and nearly two-thirds (64%) of those treated in EDs. Age-adjusted TBI-related fatality rates were three times as high among male residents (19 deaths/100,000) compared to female residents (6/100,000), and rates of TBI-related hospitalizations were twice as high among males compared to females (105 vs. 52/100,000, respectively). All-ages rates of TBI-related ED visits were 35% higher among males (836 vs. 619/100,000 for females), but females had significantly higher rates among senior-aged residents.



### TBI Prevention Strategies

CDC's National Center for Injury Prevention and Control (Injury Center) is committed to protecting people against preventable TBI by putting science into action.

- **State Injury Prevention Programs** - The Injury Center's Core Violence and Injury Prevention Program (Core VIPP) funds state health departments to estimate the impact of TBIs and define the groups most affected. [www.cdc.gov/injury](http://www.cdc.gov/injury)
- **Heads Up** – Injury Center campaigns with free tools for health care providers, school administrators, nurses, teachers, coaches, and parents to help them recognize and respond to a TBI. [www.cdc.gov/traumaticbraininjury](http://www.cdc.gov/traumaticbraininjury)
- **Motor Vehicle Safety** – Motor vehicle crashes are a leading cause of death, injury and TBI in the US. CDC's primary prevention focuses on child passenger safety, seat belt use and reducing impaired driving. [www.thecommunityguide.org/mvoi](http://www.thecommunityguide.org/mvoi) [www.cdc.gov/motorvehiclesafety](http://www.cdc.gov/motorvehiclesafety)

## Hawaii TBI Activities

### Prevention

The Kinesiology and Rehabilitation Science Department of the University of Hawaii at Manoa continues to be a leader in supporting the implementing [Act 197](#) in Hawaii's public schools by providing concussion testing and education, and serving as a clearinghouse of data and information. The Hawaii Department of Health Neurotrauma Fund supported the Kinesiology Department, which will be forming a coalition to help sustain efforts in schools.

The Hawaii State Department of Health (DOH) supported [Senate Bill 345-SD1](#) to raise the age of passengers permitted to ride in the bed of a pickup truck from twelve to under eighteen. Although the bill did not pass, it provided the opportunity to educate legislators on the need to increase the age. One-third of the 33 truck bed passengers killed in traffic crashes since 1996 were 18 years of age or younger.

The Fall Prevention Consortium coordinated by the DOH, EMS & Injury Prevention System Branch (EMSIPSB) supported initiatives in 2015 to reduce falls among older adults. Tai chi for health classes for seniors are increasing on all islands and have been incorporated by Kaiser Permanente and senior centers such as the Catholic Charities Lanakila Multi-Purpose facility. Activities and media coverage for the [2015 Senior Fall Prevention Campaign](#) included: medication reviews and balance testing offered by the 51 stores representing 7 major corporations. The public broadcast station and three of the four major networks covered fall prevention during the summer months, using nationally recognized messaging on the four pillars of fall prevention: medication review, vision screening, and exercise for strength and balance and home safety.

### Surveillance

TBI related deaths and hospitalizations are tracked on an annual basis by age group and gender as part of the CDC Indicator Report. The causes of TBI were examined in the [Injuries in Hawaii, 2007-2011](#) data book, and updated reports are available from the DOH, EMSIPSB.

Note: TBI-related cases were identified by first limiting the datasets to injury cases based on external cause of injury (deaths), primary diagnosis (hospitalizations), or both (emergency department visits). All fields were then searched for TBI diagnostic codes. Reference to any commercial entity or product or service on this page should not be construed as an endorsement by the Government of the company or its products or services.

Hawaii State Department of Health, Emergency Medical Services & Injury Prevention System Branch

<http://health.hawaii.gov/injuryprevention/>

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