Team 10

Traumatic Brain Injury (TBI)

Spreading awareness of TBI

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Introduction

TBI

Traumatic Brain Injury

Brain Injury Awareness Month, observed each March, was established 3 decades ago to educate the public about the incidence of brain injury and the needs of persons with brain injuries and their families.

Traumatic Brain Injury (TBI) is caused by a bump, blow, or jolt to the head, or penetrating head injury which can lead to short- or long-term changes affecting thinking, sensation, language, or emotion.

The goal of this project is to **spread awareness for just how common TBIs are - both in civilian and military populations.**

What are TBI Symptoms?

Physical Symptoms

Headaches, dizziness, nausea, sensitivity to light/noise, vision changes.

Cognitive Symptoms

Memory problems, difficulty concentrating, confusion, speech issues

Seizures:

Some cases may lead to seizures.

Sensory & Motor Symptoms

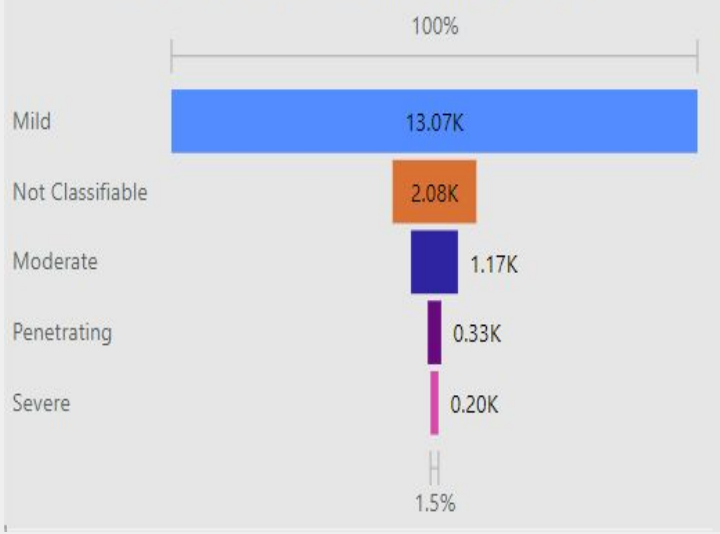
Loss of taste/smell, hearing problems, numbness, coordination issues.

Emotional & Behavioral Symptoms

Mood swings, irritability, anxiety, sleep disturbances, impulsivity.

What are the severity levels of TBI?

- There are different Levels of severity based off of loss of consciousness, length of memory loss and responsiveness after the injury.
- Mild TBI —commonly called concussions—are those that usually result in no persistent symptoms.
- Moderate and Penetrative have cognitive or behavioral risks eg prolonged period of confusion
- Most severe TBI can result in patients having significant impairment of cognitive or physical abilities i.e remaining in a coma or vegetative state



Effects of TBI

- **Cognitive Impact:**

Memory Loss, Attention Issues: Impairments affecting daily tasks and focus.

- **Physical Challenges:**

Motor Skills, Fatigue: Coordination problems, persistent tiredness affecting activities.

- **Emotional and Behavioral Changes:**

Mood Swings, Impulsivity: Emotional instability, difficulty controlling impulses.

- **Sensory Disturbances:**

Sensitivity, Vision/Hearing Issues: Heightened senses, blurred vision, ringing in ears.

- **Communication Challenges:**

Speech Problems, Social Difficulties: Difficulty speaking, challenges in social interactions.

- **Long-Term Consequences:**

Chronic Health Issues, Cognitive Decline: Increased risk of epilepsy, cognitive decline, and neurodegenerative conditions.

Causes of Traumatic Brain Injury

Unintentional falls are the leading cause of Traumatic Brain Injury

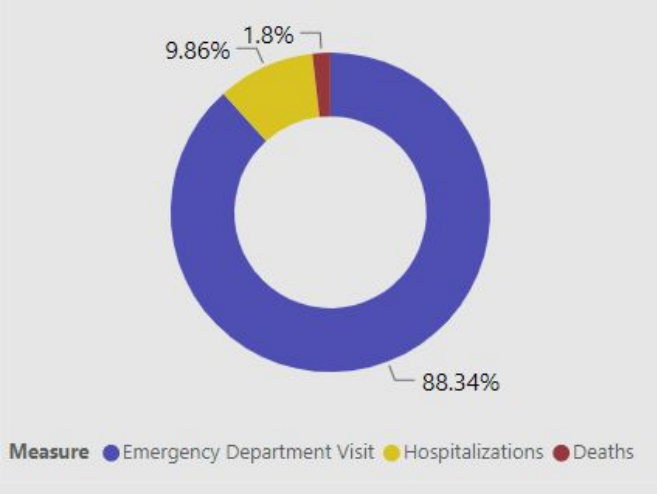
Injury Mechanism	Total number
Unintentionally struck by or against an object	980
Assault	9690
Unintentional Falls	96568
Motor Vehicle Crashes	931
Other unintentional injury, mechanism unspecified	859

Which Age Groups are at Risk?

- Adults 75 years and older and Children aged 0 - 4 years are most likely to sustain a TBI
- People aged 35 - 44 have lower rates of diagnosis of TBI as compared to other age groups
- Increased childhood activities and participation in sports contribute to more accidents, including TBIs, among young individuals.
- Reduced balance and mobility in the elderly lead to a higher risk of falls, a common cause of TBIs in this age group

Traumatic Brain Injury (TBI) Incidence

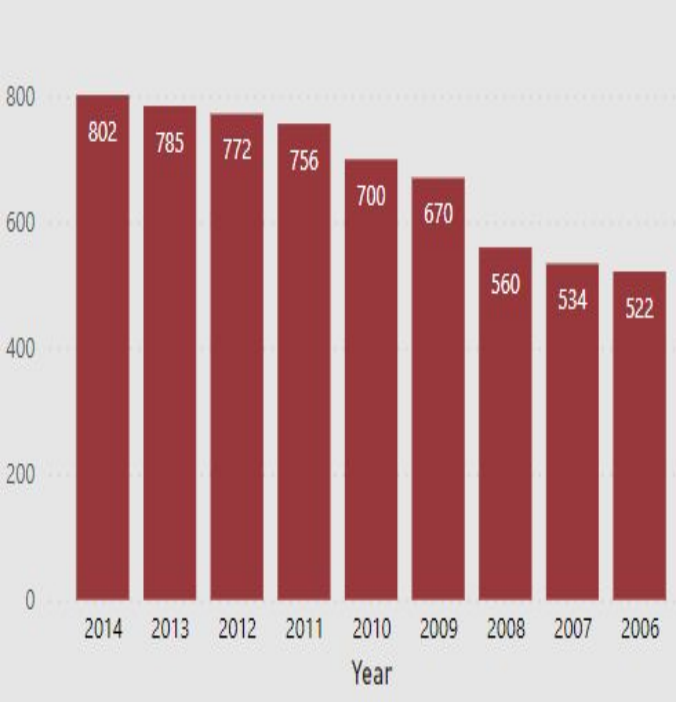
- 88.34% people with TBI are most likely to be treated in an emergency department
- 9.8% of people sustain a TBI severe enough to require hospitalization
- 1.8% Deaths caused by TBI



Diagnosis Rates in Different Years

The Increase of Diagnosis Rates of TBI from 2006 to 2014 has been attributed by:

- ★ Increased Awareness campaigns and education initiatives
- ★ Enhanced medical technology and updated diagnostic criteria
- ★ The overall increase in the population
- ★ Enhanced data collection methods and comprehensive reporting systems provided more accurate TBI case representation.
- ★ Lifestyle changes eg. Increased sports participation, and altered alcohol consumption patterns

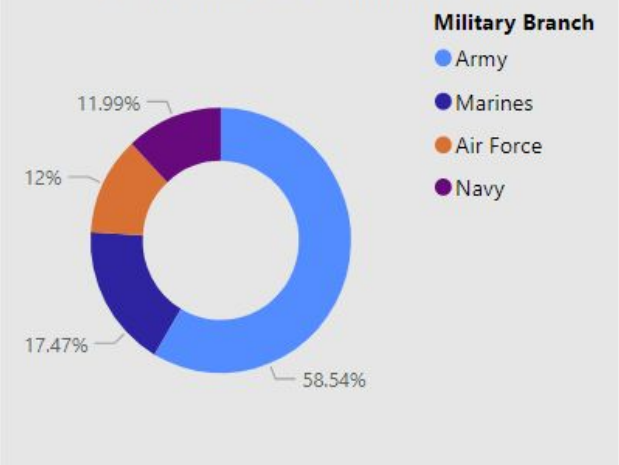


02

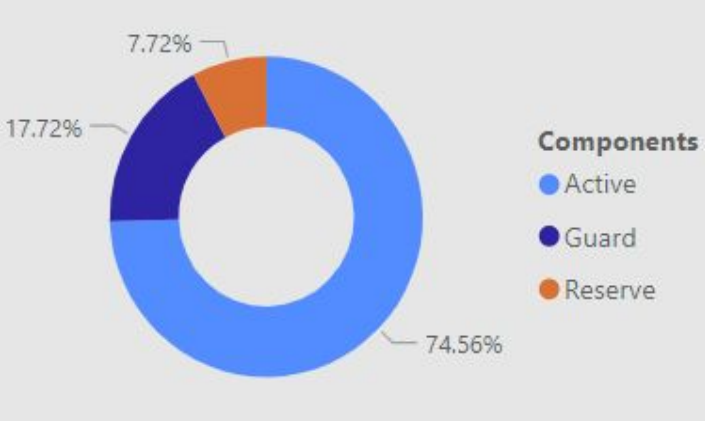
TBI in Military

Traumatic Brain Injury in Military

- Traumatic brain injury is a significant health issue that affects service members and veterans.
- The Army reports the highest rates to likely sustain TBI
- The rate of combat-related brain injuries in service members returning from the current conflicts in Iraq and Afghanistan is higher than in previous conflicts.
- **Blast injuries are a significant cause of TBIs in Military**



Which military Components are at risk?



Active

Due to its active combat duties and intense training exercises. Soldiers often face direct exposure to combat-related incidents, leading to a higher incidence of TBIs.

74.6%

Guard

Guard members balance civilian life with military duties, facing unique challenges.

17.7%

Reserve

This could be attributed to differences in deployment rates, specialized training, or effective preventive measures implemented within the Reserve.

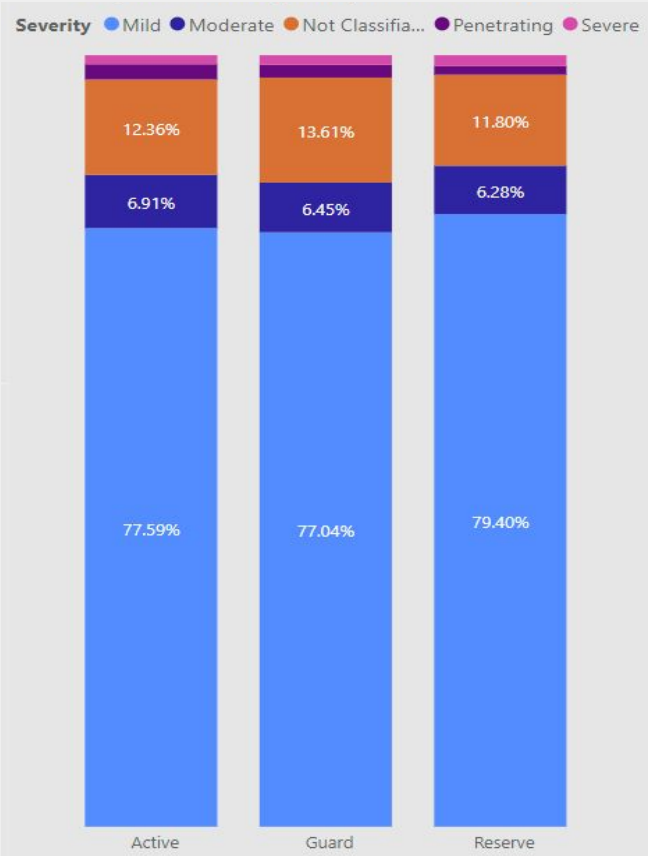
7.7%

Severity Levels in Different Military Components

- Army: Due to its active combat role, the Army might experience a broad range of TBI severities, including mild, moderate, and severe cases. Combat-related incidents and explosives contribute to these injuries.

- Guard: Guard members, balancing civilian and military duties, might experience mild to moderate TBIs. Training exercises, domestic emergencies, and deployments can be sources of these injuries.

- Reserve: The Reserve component, with a lower incidence of TBIs, might primarily experience mild TBIs due to training exercises and occasional deployments. Severe cases would be relatively rare.

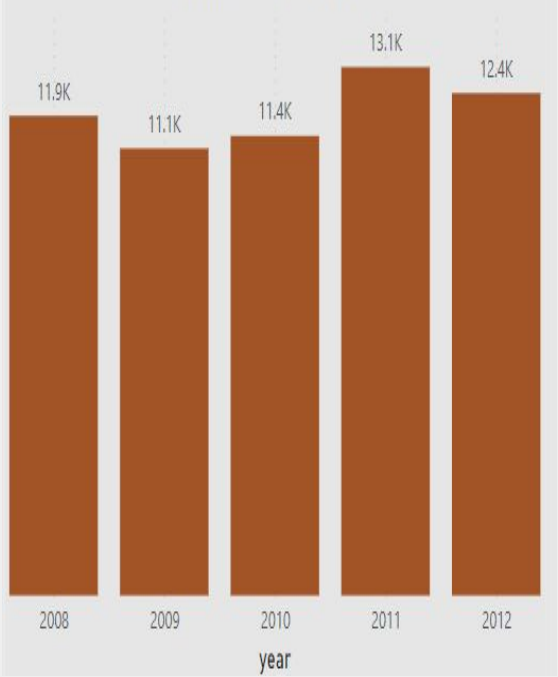


Diagnosis Rates in Different Years

Diagnosis Rates of TBI in Military is fluctuating as compared to the civilians.

This is attributed by:

- ★ Varying deployment rates lead to different levels of exposure to combat situations
- ★ The nature and intensity of military missions fluctuate yearly
- ★ Shifting military operations and engagement in different regions
- ★ Fluctuations in training programs and preparedness initiatives influence accident rates



Effective Care and Management of TBI

- **Early Diagnosis:** Prompt evaluation through imaging and neurological assessments is crucial for determining the severity of the injury.
- **Individualized Treatment:** Tailored interventions, including physical, occupational, and speech therapy, address specific symptoms and needs.
- **Pharmacological Support:** Medications manage symptoms such as headaches and seizures, enhancing the patient's overall well-being.
- **Psychotherapy and Support:** Counseling services and support groups assist in addressing emotional and psychological challenges faced by TBI patients.
- **Rehabilitation:** Physical therapy, along with assistive devices, aims to restore motor skills and aid in regaining independence.

Effective Care and Management of TBI

- **Family and Social Support:** Education for families, social reintegration efforts, and long-term monitoring ensure comprehensive care.
- **Regular Assessments:** Ongoing evaluations monitor progress, allowing adjustments to treatment plans for optimal outcomes.

Prevention of Traumatic Brain Injury (TBI)

Helmets:

- Essential Gear: Stress the importance of wearing helmets in various activities prone to head injuries.
- Specific Use: Highlight different helmet types for biking, sports, and motorcycling for tailored protection.

Safety Advocacy:

- Bicycle & Sports: Promote consistent helmet use, emphasizing proper fit and compliance with safety rules.
- Workplace & Motorcycles: Encourage strict adherence to helmet regulations in workplaces and on motorcycles, emphasizing certified, high-quality helmets.

Awareness Initiatives:

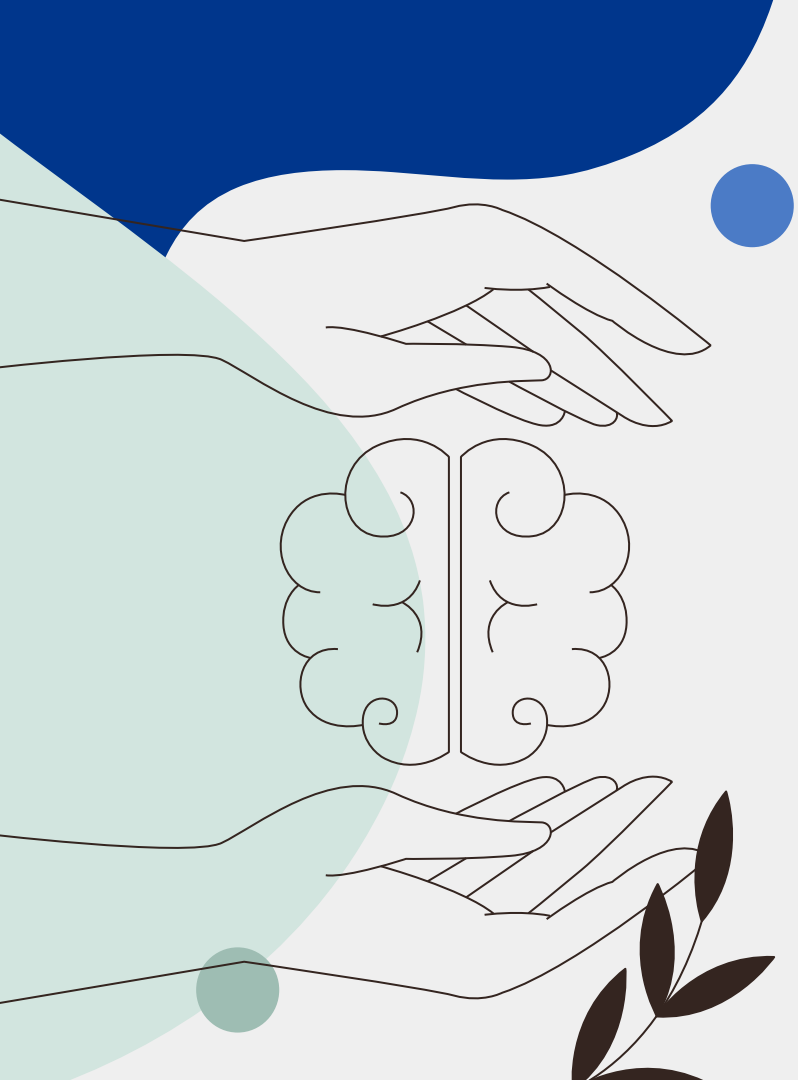
- Community Outreach: Organize workshops, school programs, and social media campaigns to educate on TBI risks and prevention.
- Role Modeling: Encourage influencers and leaders to wear helmets, leveraging positive peer influence within communities.

Transformative Technologies in TBI Management

- **Telemedicine and Remote Monitoring:** Enables virtual consultations and wearable devices for continuous patient monitoring.
- **Neuroimaging and Diagnostics:** Utilizes advanced imaging techniques like fMRI, CT scans, and PET scans for accurate diagnosis and monitoring brain abnormalities.
- **Cognitive Rehabilitation Apps:** Offers brain training games and speech therapy apps to enhance memory, attention, and communication skills.
- **Assistive Technologies:** Includes smart home devices and Brain-Computer Interfaces (BCIs) for improved independence and communication among TBI patients.
- **Virtual Reality (VR) Therapy:** Utilizes VR simulations for exposure therapy and motor rehabilitation, aiding in emotional and physical recovery.
- **Predictive Analytics and AI:** Employs AI algorithms for data analysis, predicting recovery paths and enabling early detection of complications.
- **Continued Advancements**: Ongoing research and innovation promise refined technologies, shaping the future of TBI management and care.

Enhancements and Future Plans

- **In-Depth Research:** Accessing the most recent studies and publications to ensure the information provided is up-to-date and accurate, especially in rapidly evolving fields like medical technology and treatments.
- **Localization**: Adapting the content to different regions or countries, considering regional variations in TBI prevalence, treatments, and preventive measures.
- **Regular Updates**: Establishing a system for regular updates to keep the content current with the latest research findings, medical advancements, and technological innovations related to TBI.



Protect your head, protect your future.

Thank You