

COSTS of Untreated Brain Injuries Caused by Traumatic Brain Injury (TBI)

[These summations are taken from "Untreated Brain Injury: Scope, Costs, and a Promising New Treatment", available on request. The reference citations can be found in that document]

Brain Injury Facts

Military

- The latest published DoD estimate for TBIs alone for the period of 2000-2010 is over 202,481. [6]. The RAND report estimated that **about one-third of all returning vets** (541,200 as of 2008) reported symptoms of some mental health or cognitive condition. [7] Other estimates range up to 600,000+.

Civilian

- CDC estimates approximately **1.7 million brain injuries** occur in the United States **every year**. [5]
- 75% of those injuries are in the forms of concussions or mild TBI. [5]
- Out of the 1.365 million TBI-related emergency room visits each year, approx. 230,000 require hospitalization, 52,000 die and about 20% (340,000) are left with some form of lingering disability [7,11,12,13]
- At least 5 million Americans currently have a long-term or lifelong need for help to perform activities of daily living as a result of a TBI (1999 CDC estimate) [3]

Psychiatric Sequelae

- In civilian TBI, psychiatric disorders following TBI have been observed in 48% to 61% of patients with major depression being the most common. [17] Other observed disorders include anxiety, negative affect and suicidal ideation. [16]
- AHRQ estimates the rate of depression in TBI individuals at 30% versus 10% in uninjured counterparts [19]

Effect on Employment

- In civilians with a lingering disability, studies show about a **45% drop in employment one year post injury** (avg. from 5 studies)
- According to the BLS, the **unemployment rate in returned veterans** (14.1%) is **nearly double that of their non-veteran peers** (7.3%)[56]. Many attribute that difference to high rates of PTSD, depression and other TBI consequences in the veteran population [58].

TBI and Homelessness

- Several studies report incidence rates of head injury/TBI well over 50% in the homeless population [7, 27,28].
- Veterans make up 8% of the total US population, but comprise 23% of the adult homeless population despite a higher education level (85% with high school diploma or GED equivalent versus 56% for the non-vet homeless) [59]. The vast majority of the homeless vets served our country valiantly and well. 89% received an honorable discharge[59].
- The VA estimates that approximately 154,000 veterans were homeless in 2007, 131,000 in 2008, and 107,000 in 2009 [60].
- A study of hospital admissions of homeless people in Hawaii found that 1,751 adults were responsible for \$4 million in admission costs during the two-year study period, about \$2,280 each. Further, the rate of psychiatric hospitalizations was more than 100 times greater than their non-homeless cohort [30].
- U.S. government spent \$3.5B on issues pertaining to homeless veterans in 2010. The VA is now asking for \$4.2 billion in 2011 for issues related to homeless veterans [63].

TBI and Incarceration:

- Approximately 2.3 million people are currently being held in U.S. prisons and jails. Of that number, the rate of TBI is high and ranges from 25% to 87% of incarcerated individual [32,34] In a recent survey using the Traumatic Brain Injury Questionnaire (TBIQ) on 998 Minnesota male state prisoners, 82.8% reported having had one or more head injuries during their lifetime [35]
- The TBI rate in non-incarcerated individuals is estimated at less than 8.5%.
- A growing number of state and criminal courts are solely devoted to U.S. war veterans returning from Iraq and Afghanistan. These courts have emerged in response to the increasing number of soldiers showing up as defendants with a "special set of problems." [66]
- If we extrapolate from 2004 BJS statistic that approximately 20% of the prison population report prior military service holds true for today, getting veterans with mental health issues appropriate treatment could yield a savings of \$1.9 billion annually if only 10% (or half) of veterans could be treated and kept out of the criminal justice system [36].

Costs Directly Attributable to Brain Injury

Veterans

- In testimony before the House VA Committee, the cost of treating brain-injured service members with drugs and keeping them in Warrior Transition Units was stated to be up to \$60k/year (in addition to the costs of finding a replacement).
- The RAND report [7] estimated that the two-year costs (costs incurred within the first two years after service members return home) on a per-case basis for PTSD were approximately \$5,904 to \$10,298, depending on whether or not lives lost to suicide were included.
- The two-year per-case costs associated with depression were approximately \$15,461 to \$25,757 and for co-morbid PTSD and depression, the costs were \$12,427 to \$16,884. [7]
- Overall, RAND estimated the total two-year costs of PTSD and depression in 2007 could range from \$4.0 to \$6.2 billion. Approximately 55 to 95% of total costs can be attributed to loss of productivity making it a key cost driver for PTSD and major depression.
- RAND estimates the one-year cost for service members who had accessed the healthcare system and received a diagnosis of TBI to range from \$27,259 to \$32,759 (2007 dollars). For moderate to severe cases, the costs ranged from \$268,902 to \$408,519 (2007 dollars). **Applying the RAND costs for mild TBI to the current DOD estimated number of 202,481 yields a projected one-year cost of \$5.5B to \$6.6B**

Civilian TBI

- According to the CDC the direct (e.g., medical) and indirect costs (e.g., loss of productivity) of TBI in the United States totaled an estimated **\$76.5 billion annually** in 2010 dollars [7]
- Survivor costs account for \$31.7B annually [14]
- Lifetime costs for one surviving TBI individual can reach \$4 million [14]
- Using data from the CDC, NINDS, and studies on TBI and unemployment, the **annual total for loss of tax revenue and increase in societal and cost-of-care expenditures from TBI-related civilian unemployment** is estimated to be **\$37.5 Billion**.
- Workers suffering from depression cost employers as much as \$44 billion dollars a year [20]
- Many individuals suffering from a TBI will experience frequent re-hospitalizations in the years following their injury, further adding to the direct costs of TBI [21].

Conclusion:

Being conservative, if we assume a population of persons of only 200,000 brain-injured to the point where they are on disability, it can be shown that the probable cost-to-society just on the basis on disability expenses and of lost tax revenues only (not including the collateral costs of homelessness, broken families, incarceration, suicide, etc.), will be **\$ 288.7 Billion** over 50 years to continue with the status quo, where safe and effective treatments are denied. With HBOT treatments, again, being conservative, we can say that the cost to treat and heal those 200,000 veterans will be **\$5 Billion** [this is not factoring in economies of scale that can be realized when volume will drive the costs down enormously.] **Simply put, for less than 1.7% of the status quo costs, we can treat and help in the healing of hundreds of thousands of the wounded and injured with a safe therapy that thus far has enabled approximately 80% of those treated to return to work, school or duty. Left out of this calculation, of course, is the intangible benefit to the wounded and to their families of getting their lives back.**

Selected Acronyms:

AHRQ	Agency for Health Research and Quality
BJS	Bureau of Justice Statistics
CDC	Communicable Disease Center
NINDS	National Institute of Neurologic Disorders and Stroke