

# The Brain-Wounded Veteran Brain Drain in Maryland



## *CARE FOR HIM WHO SHALL HAVE BORNE THE BATTLE*

~ Abraham Lincoln

Prepared for Senator Sarah K. Elfreth, and the State of Maryland Legislature

By

The TreatNOW Coalition, Eric Koleda (National Director – Legislative Efforts)

[www.treatnow.org](http://www.treatnow.org)

January 2022



## Executive Summary

The costs of the twenty-year wars in Afghanistan, Iraq, Syria, and Pakistan are staggering. According to a recent study, they have cost American taxpayers \$6.4 trillion.<sup>1</sup> In addition, the Watson Institute of International and Public Affairs report at Brown University finds that more than 801,000 people have died directly from fighting.<sup>2</sup> As of February 2, 2021, over 7,053 US personnel have been killed in Iraq and Afghanistan. Moreover, traumatic Brain Injuries, the “invisible wounds,” and the “signature injuries” to US service members are over eight hundred thousand, in addition to the tens of thousands of visibly wounded combatants.

Realistic estimates of TBI-related costs in the military are achieved through comprehensive long-term studies that have never been produced to our knowledge. Actual cost data at the level of individual patients is required. Variables included specific TBI characteristics, treatments, comorbidities, health consequences, rehabilitation needs, and long-term disability. Such a study must follow injured Veterans over a long period to collect accurate cost data for all services they receive. An investigation must also account for the effects of improvements in technology and treatment on costs to ensure compatibility of cost estimates from different periods. Information about the economic consequences of TBI-related mortality must be obtained from families of those Veterans who died from TBIs. Costs in this document were conservatively understated scaled as not to overstate the economic impact

Over 98 percent of the current pharmacologic treatment for TBI and PTSD are NOT FDA approved and off label. Yet, treating TBI with off-label drugs, processes, devices, and protocols not authorized by the FDA for TBI is a continuing formula for failure to prevent, much less reverse, the TBI Veteran suicide and opioid epidemic. In addition, failures of a growing number of psychological interventions have also proved ineffective in reversing the suicide epidemic. As a result, costs and suicides continue to escalate. In fact, by VA accounting, the national suicide rate has steadily increased since 2005.

***The current estimated annual societal economic impact by Maryland TBI veterans is \$584,586,024 (Table 1) that live with an untreated, undiagnosed, or misdiagnosed TBI. This calculated loss of economic activity is spread across a complex of known impacts. It includes Veteran caregiver cost, drug, and opioid-induced costs, including loss of state and federal income tax, loss of state and federal tax revenues from TBI suicides, pharmaceutical costs,***

---

<sup>1</sup> <https://abcnews.go.com/International/wireStory/counting-costs-americas-20-year-war-afghanistan-77414628>

<sup>2</sup> Watson Institute International & Public Affairs, Brown University Cost of War, Human Cost of Post 9/11 Wars: Lethality and Need for Transparency, November 2018, Neta C Crawford

unemployment, homelessness, incarcerations, loss of state sales taxes, state vehicle taxes, non-taxable VA and Social Security disability payments, incarceration state costs, and pharmaceutical costs. Therefore, a conservative approach to the total economic impact for each of the cost elements described herein is used in the following data.

Treating and healing brain wounds, now possible, can tip the scales to reverse the suicide epidemic among service members and break accelerating costs. The financial benefits to the VA and US Federal, State, County budgets are significant. The VA Mission Act of 2018, Public Law 116-171, S.785, the Commander John Scott Hannon Veterans Mental Health Care Improvement Act of 2019, The Executive Order on a National Roadmap to Empower Veterans and End Suicide support and provide for TBI Veterans accessing this treatment.

## 2021 Estimated Maryland TBI Veteran Economic Societal Cost Impact

Revenue Stream	Estimated Type Revenue	Total Estimated Cost
Total Veteran Caregiver Cost (CG)	TBI CG Cost Per Yr 21,780 x \$13,581	\$295,794,180.00
TBI Veteran Opioid Use Disorder	State Income Tax Revenue Loss	\$6,251,659.00
TBI Veteran Opioid Use Disorder	Federal Income Tax Revenue Loss	\$26,770,406.00
TBI Veteran Opioid Use Disorder	VA Disability Payments(non-taxable)	\$17,967,969.00
TBI Veteran Opioid Use Disorder	Social Security Disability (non-taxable)	\$19,382,400.00
TBI Veteran Pharmaceutical Cost	TBI Veteran Pharma Cost Per Yr Per Vet	\$8,621,111.00
TBI Veteran Suicide	State Income Tax Revenue Loss	\$678,114.00
TBI Veteran Suicide	Federal Income Tax Revenue Loss	\$2,903,773.00
TBI Veteran Suicide	Social Security Disability (non-taxable)	\$2,102,400.00
TBI Veteran Suicide	VA Disability Payments(non-taxable)	\$1,948,977.00
TBI Unemployed Veterans	Unemployed State Income Tax Loss	\$17,078,267.00
TBI Unemployed Veterans	Unemployed Federal Income Tax Loss	\$73,131,338.00
TBI Homeless Veterans	State Income Tax Revenue Loss	\$3,418,440.00
TBI Homeless Veterans	Federal Income Tax Revenue Loss	\$14,638,200.00
TBI Veteran Incarcerations	State Veteran Incarceration Cost	\$51,295,968.00
TBI Veteran State and Local Taxes	State and Local Property Tax Loss	\$13,228,965.00
TBI Veteran State Property Tax	State Vehicle Property Tax Loss	\$0.00
TBI Veteran State and Local Sales Tax	State and Local Sales Tax Loss	\$29,373,857.00
<b>Maryland Total Estimated Annual Cost Impact</b>		<b>\$584,586,024.00</b>

**Table 1**

Note: The cost analysis details for each of the above category sections appear in this report.

## TBI Veteran Caregiver Economic Yearly Cost

“The RAND Report reflects 41,163 households contacted, 28,164 (68 percent) of caregivers responded to complete the screener for the survey. Of this group, 1,129 military caregivers and 1,828 civilian caregivers participated, making this study the largest and only nationally represented survey of military caregivers to this date in 2013. The report goes on to indicate there are 5.5 million caregivers in the US, approximately 20 percent or 1.1 million who are caring for persons who served post 9/11.”<sup>3</sup> We used a conservative 1.1 million military caregivers as the basis for our analysis. We then used the Maryland percentage of Veterans to the total US Veteran population of 1.98 percent. We applied that same percentage to the US caregivers to estimate the total number of Veteran Caregivers in Maryland. That equates to an estimated 21,780 Maryland caregivers (1,100,000 x 1.98%).

<sup>3</sup> 2014 RAND Report, “Hidden Heroes, America’s Military Caregivers

Key findings include that 33 percent of all post-9/11 military caregivers are spouses of the care recipient, 25 percent are the care recipients' parents, for a total of 58 percent being either spouses or parents. In addition, the report identified 64 percent of post-9/11 military care recipients have a mental health or substance use disorder, nearly 50 percent of all post 9/11 military care recipients have depression. Finally, approximately 76 percent of post-9/11 military caregivers are in the labor force but, on average, miss one day of work per week or 52 days per calendar year.

“RAND estimated and assigned an economic value to an hour of family caregiving of \$11.16 per hour, 18 hours per week on average, multiplied by 52 weeks in 2013 cost”.<sup>4</sup> Using the US average 114 year average inflation rate of 3.24 percent, it equates to \$14.51 per hour in 2021, times 18 hours average per week and 52 weeks per year, or on average, \$13,581 per year, per caregiver. Using the estimated 21,780 Maryland military caregivers' times the \$13,581 estimated annual cost impact per caregiver equates to an estimated **\$295,794,180 million per year of unpaid Maryland labor for family TBI Veteran caregivers.**

## **TBI Veteran Suicide Epidemic (VSE) and Cost**

In the last four years, the official government estimate on the number of veterans who die by suicide has gone from 22 a day to 17 a day, according to the latest Veterans Affairs report. But the rate of suicides among Veterans didn't decrease over that span. Instead, how the VA calculated the figures by sorting and presenting did! Instead, outside experts note that the problem has worsened by many standards, particularly during COVID when suicides are up for all categories. The total number of suicides among Veterans has increased four of the last five years on record. From 2007 to 2017, the rate of suicide among Veterans jumped almost 50 percent. Veterans are 1.5 times more likely to die by suicide than Americans who never served in the military. For female Veterans, the risk factor is 2.2 times more likely. ***“Our takeaway from all this is that what we are doing is not working,” “Everyone has been focused on this, but we're not seeing results,”*** said Chanin Nuntavong, National Director of Veterans Affairs and Rehabilitation for the American Legion.

A significant study was published in 2016 that throws new light on the difficulty of differentiating between brain injuries caused by either PTSD or TBI. In what is being called a breakthrough study, Dr. Daniel P. Perl and his team at the Uniformed Services University of the Health Sciences in Bethesda, MO, USA [the medical school run by the Department of Defense], have found evidence of tissue damage caused by blasts alone, not by concussions or other injuries. The New York Times calls it the medical explanation for shellshock: preliminary proof of what medicine has been saying without proof for nearly 100 years -- blasts cause physical damage, and this physical damage leads to psychological problems, *i.e.*, PTSD.

Over one billion dollars was spent on research, treatments, and interventions that may or may not have contributed to the small number of infections and deaths. Yet the suicide epidemic and hundreds of thousands of veterans and active duty suffering from brain injuries, coupled with a

---

<sup>4</sup> The RAND Report, “Hidden Heroes, America's Military Caregivers” dated 2014, page 155-156, Potential Benefits and Costs to Society

suicide rate of 20 per day, for a total estimated at over 48,000 (nearly five combat divisions), has caused no sense of urgency and immediate use of therapies.

Evidence that the VA aims at symptom identification and resolution on a symptom-by-symptom basis – as opposed to holistic, integrated, patient-centered, precision medicine- can be found in the latest update to VA and DoD Clinical Practice Guideline the Management of Concussion-Mild Traumatic Brain Injury. In addition, evolving treatment protocols turn toward isolating individual symptoms and treating those symptoms of brain injury instead of focusing on the cause – the underlying brain injury.

There should be a call for action and change in a significant way. For example, a study of 273,591 veterans (16% with TBI history or 43,775) receiving care from the Department of Veterans Affairs reported a connection between TBI, PTSD, and suicide attempts. The authors found an increase in suicide attempts among those with deployment related TBI than those without TBI (hazard ratio 3.76, 95% CI 3.15 to 4.49).<sup>5</sup> Further analysis showed that psychiatric conditions mediated 83% of the association between TBI and attempted suicide, with PTSD having the most significant impact hazard. So, the November 2018 Defense and Veterans Brain Injury Center Research concluded population-level investigations have consistently found elevated rates of death by suicide, as well as suicide attempts and suicide ideation in individuals with a positive history of TBI.

A systematic review conducted by Bahraini supported an increased risk of suicide among persons with TBI history compared to those with no TBI history.<sup>6</sup> Some non-military studies have reported that the risk of death by suicide maybe three to four times higher for individuals with TBI than for the general population.<sup>7</sup> A surveillance study of 20 years of data from Canadian health and vital statistics databases found that persons with mTBI were three times more likely to die of suicide than someone in the general population.<sup>8</sup> Swedish researchers conducted a large longitudinal study and found that TBI patients are three times more likely to die by suicide when compared to matched controls from the general population without a history of TBI.<sup>9</sup> And the same rate of increase in suicide death one-year post-TBI was found in a study by Harrison-Felix et al.<sup>10</sup> “The DoD is reimbursing for off-label use of FDA Black Box labeled drugs that have been implicated in the marked suicide rate in our injured veterans. These drugs mask symptoms or act as chemical restraint, leaving untouched the underlying brain injury that is repaired by HBOT 1.5.”<sup>11</sup> There currently is “NOT” any of the approximately 100 medications routinely prescribed to TBI Veterans that are FDA approved; they are all “off-label” and experimental. How is it oxygen, an FDA-approved drug and not widely used for TBI when used in the medical capacity?

---

<sup>5</sup> Jennifer R. Fonda et al., A Methodology for Assessing Deployment Trauma and Its Consequences in OEF/OIF/OND veterans: The TRACTS longitudinal prospective cohort study, 2016

<sup>6</sup> Psycnet.apa.org, Suicidal ideation behaviors after traumatic brain injury: A systematic review. Bahraini, Simpson, Brenner, Hoffberg, & Schneider, 2013

<sup>7</sup> Pubmed.ncbi.nlm.nih.gov, Suicidality in people surviving a traumatic brain injury: prevalence, risk factors and implications for clinical management. Simpson & Tate, 2007

<sup>8</sup> Pubmed.ncbi.nlm.nih.gov Fralick, Thiruchelvam, Tien, & Redelmeier, 2016

<sup>9</sup> Fazel, Wolf, Pillas, Lichtenstein, & Langstrom, 2014

<sup>10</sup> Pubmed.ncbi.nlm.nih.gov, Harrison-Felix et al., 2009

<sup>11</sup> Dr. Paul Harch, Suicides in the U.S. Military Personnel, Veterans of War in Iraq and Afghanistan, and the Core Medical treatment for Mild-Moderate Traumatic Brain Injury & PTSD, June 22, 2010, report to Senate Armed Services Committee.

The VA 2005 to 2017 historical suicide report is a revelation. ***We have lost more than 78,000 veterans to suicide over the past 13 years by the VA accounting (Table 3 Page 11).*** That is, by CDC standards, a national epidemic. Approximately 7,300 Veterans have committed suicide each year over the past ten years (73,000), while the number of Veterans of wars declined by about 15 percent. The VA/DoD may not account for veteran suicides if they are not active duty or enrolled in the DoD/VA, so there is a variance in the VA accounting, with actual suicides reported. As recently as four years ago, VA leaders were referencing the “22 a day” statistic regarding Veteran suicide based on partial state death records data and internal estimates. “Between March and August 31, 2020, 144 active-duty Army soldiers killed themselves up from 88 in 184 days.”<sup>12</sup> “When Army reservists and national guardsmen have added the figure, it jumped to 200, compared with 166 for last year’s period. The rate of suicide currently among active-duty Army soldiers is 36 per 100,000 defense officials said, up from 25.9 deaths per 100,000 last year”.<sup>13</sup> The military leaders attribute the increase to Covid 19 induced isolation from families suffering from and dying of Covid 19, which has created additional stress and inability to travel.

www.VA.vetdata.gov reported from 2005 through 2017, 78,875 veterans have committed suicide, a thirteen-year average of 6,067 per year. Males accounted for 75,975 of those deaths or 96% of the total. Although the suicide rate in the US Army has traditionally been below the demographically matched civilian rates, it has climbed steadily since the beginning of the conflicts in Iraq and Afghanistan. During these tours, suicide rates among service members rose from 9.9 to 22.7 per 100,000.<sup>14</sup> The Army (53%) and Marines (18%) account for 71 percent of all TBI’s incurred by service members since the Iraq and Afghanistan conflicts.

“The number of veteran suicides has exceeded 6,000 every single year between 2008 and 2017, and in 2017, the suicide rate for veterans was 1.5 times the rate for non-veteran adults.”<sup>15</sup> The daily suicide rates continue to climb to over 30.5% over the 2005 rates. We can point towards ineffective treatments, program assessments, or the deluge of “more research,” or perhaps the symptom-based non-FDA-approved drug treatment protocol for causes. What is not being addressed is the actual root cause, ***that mTBI is a physical brain wound, and protocols prescribing black box off labeled, non-FDA approved drugs by the VA is impacting the suicide rate. The rate of suicides has continued to climb each year since 2005 unabated.***

“Since late 2001, US military forces have been engaged in conflicts around the globe, most notably in Iraq and Afghanistan. These conflicts have exacted a substantial toll on Soldiers, Marines, Sailors, and Airmen, which goes beyond the well-publicized casualty figures. It extends to the stress that repetitive deployments can have on the individual service member and their family. This stress can manifest itself in different ways—increased divorce rates, spouse and child abuse, mental distress, substance abuse—but one of the most troubling manifestations is suicides, which are increasing across the Department of Defense (DoD).”<sup>16</sup> Oddly, this is the

---

<sup>12</sup> Reported by Nancy Youssef from the Wall St. Journal

<sup>13</sup> Reported by Nancy Youssef from the Wall St. Journal

<sup>14</sup> DoD, 2011; ncbi.nlm.nih.gov, Logan, Bohnert, Spies, Jannausch 2013

<sup>15</sup> The January 23, 2020, article, “Veteran Suicide Rates Remain High Despite Year of Reform” on the [www.foxnews.com](http://www.foxnews.com) website

<sup>16</sup> Ramchand et al., The War Within: Preventing Suicide in the US Military

same period we deployed over 4 million troops, including second through fourth tours for our veterans, to Iraq and Afghanistan to combat terrorism, and the reported mTBIs escalated.

“VHA patients with mental health condition or Substance-Use-Disorder (SUD) diagnoses accessed mental health treatment services have higher rates of suicide than other VHA patients.”<sup>17</sup> The main finding reflected, “rates of suicide among users of VHA services have remained relatively stable in recent years.”<sup>18</sup> With no change in the suicide rates over fourteen years, how can the report reflect the conditions are stable? The suicide rate for VHA users in 2001 was 39.9; in 2014, it was 39.2. *Fourteen years of NO change or improvement in the VA treatment protocol are reflected in the data tracked but relatively stable.* Year over year, despite the carnage, there is homeostasis. He’s right, but the “facts” are morally bankrupt. Veterans ***who died by suicide were more likely to have sleep disorders, traumatic brain injury, or a pain diagnosis.*** “A study done by the Department of Veterans Affairs discovered that veterans are more likely to develop symptoms of PTSD for several reasons such as:

- Longer times at war
- A lower level of education
- More severe combat conditions
- Other soldiers around them killed
- ***Brain/head trauma***
- Female gender
- Life lasting physical injuries
- Military structure”

Brain/head trauma is the same as Traumatic Brain Injury (TBI) or concussions although there could be actual penetrating head injuries from explosions, hostile fire, etc.”<sup>19</sup>

## **What is the Relationship Between TBI and Suicides?**

Our country is currently experiencing a ***20-year epidemic*** of monumental proportions in the form of ***military suicides***. At 20 suicides per day, we have experienced an estimated 109,500 (15 years x 7,300) military suicides since 2005, and the number continues to grow.

“Veterans with multiple brain injuries are twice as likely to consider suicide, compared with those with one or none.”<sup>20</sup> A VA site comments: “A new study finds that post 9-11 Veterans with a history of repeated traumatic brain injuries-versus none-are at much greater risk for considering suicide.”<sup>21</sup> The study stemmed from interviews with more than 800 Veterans who held combat roles in Iraq and Afghanistan. About half of the Veterans in the study experienced at

---

<sup>17</sup> The August 3, 2016, VA Suicide Among Veterans and Other Americans 2001-2014 Report, Page 9

<sup>18</sup> The August 3, 2016, VA Suicide Among Veterans and Other Americans 2001-2014 Report, Page 15

<sup>19</sup> The “United States Military Veteran Suicide,” article on Wikipedia edited May 5, 2020

<sup>20</sup> Mike Richard, The VA Research News from the U.S. Department of Veterans Affairs reported on November 20, 2018, Study

<sup>21</sup> The VA Research News from the U.S. Department of Veterans Affairs reported on November 20, 2018, Study, the study was funded by the VA’s Mid-Atlantic Mental Illness Research, Education and Clinical Center (MIRECC), and appeared online in the journal Psychological Services in November 2018. Dr. Robert Shura, a neurologist at the W.G. (Bill) Hefner VA Medical Center in North Carolina led the study. The study was funded by the VA’s Mid-Atlantic Mental Illness Research, Education and Clinical Center (MIRECC), and appeared online in the journal Psychological Services in November 2018. Dr. Robert Shura, a neurologist at the W.G. (Bill) Hefner VA Medical Center in North Carolina led the study.

least one TBI. Of those, almost 20 percent had a history of multiple TBIs reported suicidal ideation, compared with 11 percent with one TBI and 9 percent with no history of TBI. The report also points out that 18 percent met the criteria for major depression disorder (MDD), a significantly related suicide ideation symptom. Roughly 40% reported some level of suicide ideation.

The “Relationship between traumatic brain injury history and recent suicidal ideation in Iraq and Afghanistan era Veterans reports of 838 Iraq and Afghanistan war-era Veterans. Approximately 50% reported a lifetime history of at least one TBI, and 17.9 percent met criteria for current major depressive disorder (MDD).”<sup>22</sup> “The report further states that current depression and poor sleep quality were consistently associated with recent suicide ideation.”<sup>23</sup> Increasingly across multiple studies since 2004, TBI has been directly linked to increased suicide ideation amongst Veterans. The current VA treatment protocol for TBI is a symptom-driven non-FDA-approved prescription drug that has continued to produce the same suicide rates for the past 14-years.

“The systematic review and meta-analysis found a 2-fold higher risk of subsequent suicide among more than 700,000 patients diagnosed with a concussion and or mild TBI, compared with more than 6.2 million individuals who had not been so diagnosed.”<sup>24</sup> One of the most critical findings from the extensive study review of 17 different studies indicated, “There are several possible mechanisms that may explain the association between concussion and or mild TBI and suicide. A recent meta-analysis of neuroimaging studies of patients with mild TBI reported abnormal activity on functional magnetic resonance imaging and abnormal structural connectivity in brain regions critical for cognitive and emotional processing.”<sup>25</sup> We know from our research the VA does not currently recommend imaging in their guidelines for the first 30-90 days of diagnosis. So, the veterans’ mTBI is not being diagnosed early or at all through imaging technology (fMRI, SPECT). The report goes on to report, “Our results suggest that compared with people with no history of concussion and or mild TBI, there is evidence of a heightened risk of suicide, suicide attempts and suicide ideation among individuals diagnosed with these conditions.”<sup>26</sup>

TBI Veteran suicides have not subsided in any meaningful way since 2005; in fact, they have continued to climb. The VA data beginning in 2018 reflects an average of 6,067 veterans committing suicide per year at a rate of 27.7 per 100,000; that is on average of 352 more per year than 2005 (5,787 to 6,139), and the rate per 100,000 has escalated 7.1 basis points (23.9 to 31.0) (Table 7) from 2005 to 2017. Over 13 years, the number of Veteran suicides per year has escalated 6.1 percent with no signs of improvement. The veteran population has decreased by over 5 million during this period. What is not accounted for in the statistics are Veterans not enrolled in the VA committing suicide. 20 Veteran suicides estimated per day, 7,300 per year represents an estimate of all Veterans inside and out of the VA.

---

<sup>22</sup> Posted on [pubmed.ncbi.nlm.nih.gov](https://pubmed.ncbi.nlm.nih.gov) on May 16, 2019

<sup>23</sup> Posted on [pubmed.ncbi.nlm.nih.gov](https://pubmed.ncbi.nlm.nih.gov) on May 16, 2019

<sup>24</sup> The American Medical Association 2018 article in the JAMA Neurology, “Association of Concussion with the Risk of Suicide, A Systematic Review and Meta-Analysis

<sup>25</sup> The American Medical Association 2018 article in the JAMA Neurology, “Association of Concussion with the Risk of Suicide, A Systematic Review and Meta-Analysis

<sup>26</sup> The American Medical Association 2018 article in the JAMA Neurology, “Association of Concussion with the Risk of Suicide, A Systematic Review and Meta-Analysis



Our research did not identify the link of how many Veteran suicides were PTSD misdiagnosed or actual TBI Veterans. However, previous industry research has identified a correlation between TBI/PTSD diagnosis and suicides. In our economic analysis, we used 20 Veteran suicides per day, or 7,300 per year, as the basis for identifying the overall state financial impact. The 20 per day number has been widely used and reported throughout the history of the VA until just recently, in 2020. The VA excluded reporting Guard and Reserve suicides along with active-duty numbers, essentially lowering the reporting numbers but not lowering the actual number of suicides occurring across the entire military spectrum.<sup>27</sup>

## Estimated 2021 TBI Veteran Suicide Epidemic (VSE) Societal Cost Impact

(A) States	(B) Estimated State Veteran Population See Note 1	(C) Percent of Total US Veteran Population See Note 2	(D) Estimated Veteran Suicides Per Year (C X 7300) Note 3	(E) 2017 Median Household Income See Note 4	(F) 2018 State Tax Rate Note 5	(G) State Tax (EXF) See Note 5	(H) Income over \$38,701 Note 6	(I) Federal Tax Rate/ 22% over \$4453 See Note 6	(J) Social Security Tax/ 6.2% per employee See Note 7	(K) Medicare Tax/1.45% per employee See Note 8	(L) Total Federal Income Tax Collected (I+J+K)	(M) Total Veterans VSE State Income Tax Impact (D X G)	(N) Total Veterans VSE Federal Income Tax Impact (D X L)	(O) Total Veteran VSE Disability Impact (D X \$13,349.16) Note 9	(P) Social Security Disability Payments (D X \$14,400) Note 10
Maryland	408,522	2.0%	146	\$80,776.00	5.75%	\$4,644.62	\$42,075.00	\$13,709.50	\$5,008.11	\$1,171.25	\$19,888.86	\$678,114.52	\$2,903,773.56	\$1,948,977.36	\$2,102,400.00

**Table 2**

Note 1: 2017 Veteran populations from [va.gov/vetdata/veteran\\_population.asp](http://va.gov/vetdata/veteran_population.asp)

Note 2: Individual state percent determined by taking the total veteran population of each state and dividing by total US population of 20,590,510 times 100

Note 3: 20 suicides per day x 365 equals 7,300 per year (August 28, 2019, VA Secretary Wilkie announcement at American Legion National Conference). 2019 VA National Veteran Suicide Prevention Annual Report, Page 3, 16.8 suicides per day in 2017, 2.5 suicides per day for Guard and Reserves equates to 19.3 per day, US Dept of VA, “Suicide Among Veteran and Other Americans 2001-2014” [Mentalhealth.va.gov](http://Mentalhealth.va.gov), June 1, 2019.

Note 4: 2017 median incomes from [en.wikipedia.org](http://en.wikipedia.org)

Note 5: Individual state income taxes account for 37% of state tax collections on average.

Individual state tax rates from [taxfoundation.org](http://taxfoundation.org), top state marginal personal income tax rates for 2018

Note 6: Federal income tax rate based on 2018 tables and include the following: 22%=\$38,701 to \$82,500, \$4453 plus 22% of the amount over \$38,701

Note 7: 2019 Social Security tax based on 6.2% for employee and employer or 12.4% total

Note 8: 2019 Medicare tax rate based on 1.45% for employee and employer or 2.9% total

<sup>27</sup> This was a concern in our research as close to 50 percent of the Guard and Reserves were deployed to Iraq and Afghanistan from 2001 through 2018. Reporting this data by states has been dubious and under reported. Consequently, we choose the conservative “20 per day number” as it more accurately reflects the number of military suicides occurring across America in all the active duty, reserves, and guard military services.

Note 9: For disability payments, we assumed 50% disability rating based on the presumption for service connection for all Veterans and states as the average stated by Hill & Ponton Disability Attorneys, 50% disability rating being married, with one child and one parent equates to 2020 VA.gov monthly payment of \$1,112.43 per month x 12=\$13,349.16 per year per Veteran.

Note 10: [www.Militarybenefits.info](http://www.Militarybenefits.info) reported that in 2016 the Social Security Administration (SSA) official site indicated more than 600,000 Veterans received daily payments at a range of \$800-\$1800 or an average of \$1200 per month per Veteran x 12 = \$14,400

The toll suicides are having on our Veterans, and their families impose an economic toll that can be calibrated with a higher degree of fidelity than the humanistic toll. The average Maryland economic impact of TBI Veteran suicides per year on lost state and federal taxes is estimated at **\$3,581,888 million per year** (\$678,114+\$2,903,773). The VA and Social Security disability annual impact is estimated to be **\$4,051,377 million** (\$1,948,977+\$2,102,400). The estimated annual fiscal impact is **\$7,633,265 million per year** (Table 2). These societal costs do not include prescription medications, hospitalizations, hospital or doctor medical visits, illegal drugs, community services charges, or the failed suicide attempts medical cost each Veteran undertakes each year. Consequently, the economic impact we have identified for suicides is a very conservative estimation.

The lost state income tax, federal income tax, VA, and social security disability payments from managing depression and suicidal ideation are taking their toll on our economy. In 2019, 45,390 Americans committed suicide, of which 6,139 were United States military Veterans – about 13.5 percent. Between 2005 and 2016, the suicide rate for Veterans had risen by 80 percent.

Suicide statistics for the US Veteran population indicate an average of 20 veterans per day committed suicide. Although Veterans account for only 8.5% of the US adult population, they disproportionately represent 17.9% of all deaths by suicide in US adults.<sup>28</sup> Additionally, it has been determined that Veterans receiving high doses of opioid painkillers are more than twice as likely to die by suicide than those receiving low doses.

Researchers with the University of Michigan and with the Serious Mental Illness Treatment, Resource and Evaluation Center, and the Center for Clinical Management Research at the VA Ann Arbor Healthcare System found in 2016 that Veterans receiving the highest doses of opioid painkillers were more than twice as likely to die by suicide, compared with those receiving the lowest amounts. The research team looked at nearly 124,000 Veterans who received VA care in 2004 and 2005. All had non-cancer chronic pain and received prescriptions for opioids. Using the National Death Index, the researchers identified 2,601 patients who died by suicide before the end of 2009.

---

<sup>28</sup> U.S. Department of Veterans Affairs, 2016

## VA Gov Data 2005-2017 Veteran Suicide Deaths

Year	Veteran Suicides	Veteran Population Estimate	Veteran Crude Rate Per 100,000
2005	5,787	24,240,000	23.9
2006	5,688	23,731,000	24.0
2007	5,893	23,291,000	25.3
2008	6,216	22,996,000	27.0
2009	6,172	22,603,000	27.3
2010	6,158	22,411,000	27.5
2011	6,116	22,061,000	27.7
2012	6,065	21,765,000	27.9
2013	6,132	21,415,000	28.6
2014	6,272	21,029,000	29.8
2015	6,227	20,560,000	30.3
2016	6,010	20,170,000	29.8
2017	6,139	19,803,000	31.0
<b>13 Year Total Suicides</b>	<b>78,875</b>	<b>22,005,769</b>	<b>27.7</b>
<b>Total Avg Per Year</b>	<b>6067</b>	<b>Total Average</b>	<b>Total Average</b>

**Table 3**

Note 1: The data was extracted from files prepared by the Department of Veteran Affairs Office of Mental Health and Suicide Prevention [mentalhealth.va.gov](http://mentalhealth.va.gov), National Veteran Suicide Date and Reporting Data Appendix - [https://www.mentalhealth.va.gov/suicide\\_prevention/data.asp](https://www.mentalhealth.va.gov/suicide_prevention/data.asp)

Note 2: The VA suicides recorded in Table 3 only include those veterans enrolled in the VA health care system. Approximately 10.2 million or 51 percent of Veterans are not enrolled in the VA, and suicides related to non-VA enrolled veterans were not accounted for in this chart. If you factor in the National Guard and Reserves components, it's another 3.3 suicides per day, and hence the VA estimate of 20 suicides per day or 7,300 per year were used in the cost analysis throughout this report

The US military has lost more troops to suicide than combat over the last two decades. Veterans Affairs Secretary Robert Wilkie informed the American Legion's national conference in Indianapolis on August 28, 2019, "20 Veterans a day kill themselves, about double the rate of the rest of the population". From 2006 through 2014, the DEA.gov website tracks all opioid drugs distributed across the entire US; the VA distributed over 847,000,000 million opioid pills. This accounting was from just 4 of 8 VA Consolidated Mail Outpatient Pharmacies (CMOPs) that account for approximately 80 percent of the prescription medications distributed yearly in the VA system. In Q42012, the VA indicated over **679,000 Opioid Use Disorder (OUD)** Veterans in the VA system. If 679,000 were prescribed opioids, that equates to approximately 155 opioid pills for every OUD Veteran. It was not just the number of opioid medications distributed; the dosage of the pills ranged from 40 to 400 mg per tablet. These high dosage opioid pills were a contributing factor in the 679,000 OUD Veterans.

Secretary Wilkie warned, "the VA can't do it alone, because 70 percent of those Veteran suicides never come to the VA in the first place". Presidential Executive Order on a National Roadmap to Empower Veterans and End Suicide states, "answering this call to action requires an aspirational, innovative, all-hands-on-deck approach to public health- not government as usual. To reduce the

Veteran suicide rate, the Federal Government must work side-by-side with partners from state, local, territorial, and tribal governments, as well as private and non-profit entities.” Twenty veterans per day are 7,300 veterans per year, and if 51% are not enrolled in the VA, that is 3,723 Veteran suicides outside the VA medical arena. The number may be under-reported. Many have underlying mental health conditions or substance use disorders aggravated by their military TBIs, increasing their risk. “Research Review on September 2018 Traumatic Brain Injury and Suicide deployment-related TBI, 14.0% to 23.0% screened positive for TBI during their deployment, and almost all TBIs were mild.<sup>29</sup> It’s estimated 51 percent of service members deployed to Iraq and Afghanistan were National Guard and Reserves.

## **The TBI Veteran Opioid Epidemic**

Chronic pain is more common in Veterans than in the non-Veteran US population, more often severe and in the context of comorbidities. Pain severity with mental health comorbidities results in high impact pain with a substantial restriction of participation in work, social, and self-care activities. The VHA has found 1 in 5 Veterans report persistent pain, 1 in 10 Veterans say severe constant pain, and 1 in 3 diagnosed with chronic pain.<sup>30</sup> “The most frequently identified risk factor among Veterans who died by suicide was pain.”<sup>31</sup> This pain migration leaves most combat Veterans at high risk of opioid medication addiction. The VA/DoD approach for pain management from 2006 through 2017 of prescribing opioid pills to veterans has been devastating. According to data extracted from the DEA website, over 847 million opioid medicines were prescribed and distributed to veterans through the VA Consolidated Mail Outpatient Pharmacies from 2006 through 2014. Data points towards the VA self-inflicting its own Opioid Use Disorder (OUD) over this period by prescribing low and high dosage opioid pills for pain.<sup>32</sup> The long-term economic impact on TBI Veterans is profound. An estimated 25-41% of patients on prescription opioids meet the criteria for Opioid Use Disorder. Although the VA began to make strides in late 2013 through 2017 to reduce the number of veterans being prescribed opioids, the epidemic had already gained a foothold. Veterans were dying at an epidemic rate. The number of veterans on long-term opioid therapy Q4 FY 2012 had surpassed 438,000. There is a strong correlation between this regimented prescription protocol and the instances of TBI veterans succumbing to overdose and or committing suicide during this time. The VA approach to long-term pain management for the symptoms of TBI/PTSD Veterans has escalated into a national opioid and suicide epidemic that, to this day, is continuing with no end in sight.

---

<sup>29</sup> Terrio, H., Brenner, L.A., Ivins, B.J., Cho, J.M, Helmick, K., Schwab, K., Scally, K., Bretthauer, R. & Warden, D. (2009). Traumatic brain injury screening: Preliminary findings in a US Army Brigade combat team. *Journal of Head Trauma Rehabilitation*, 24, 14-23

<sup>30</sup> Hsr.d.research.va.gov, Trends in Veterans Reporting Chronic Pain from 2008 to 2016: A National VA Study, Evan Carey

<sup>31</sup> The Behavioral Health Autopsy Report. 2015

<sup>32</sup> See for example: Art Levine, “How the VA Fueled the National Opioid Crisis and is Killing Thousands of Veterans,” NEWSWEEK, October 12, 2017

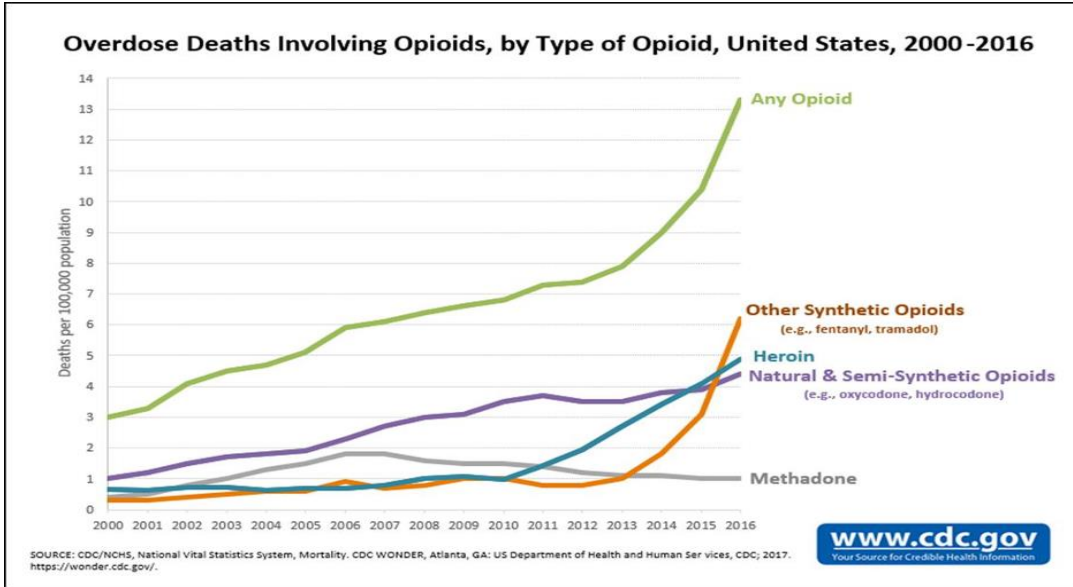


Figure 1

Chart taken from Department of Veteran Affairs, The VA Opioid Safety Initiative-How Did We Get Here and What is Ahead? By Friedhelm Sandbrink, MD and Von Moore, Pharm D, HSRD.research.va.gov

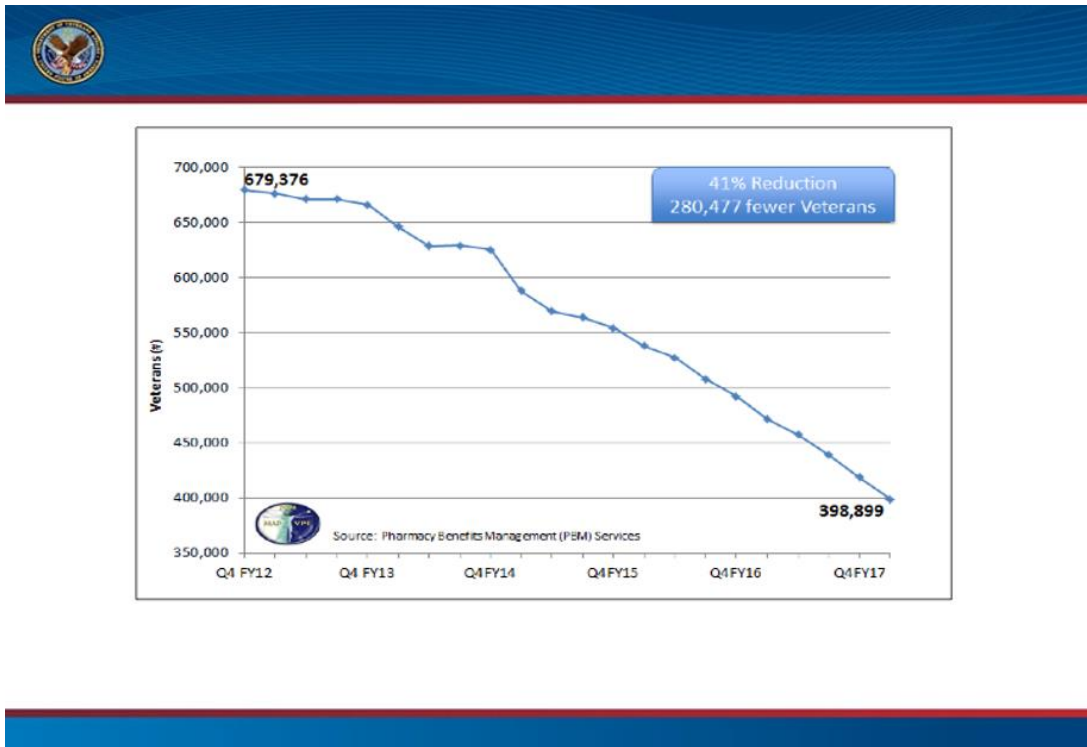


Figure 2

Chart taken from Department of Veteran Affairs, The VA Opioid Safety Initiative-How Did We Get Here and What is Ahead? By Friedhelm Sandbrink, MD and Von Moore, Pharm D, HSRD.research.va.gov

The TBI symptom-based approach by the VA and DoD resulted in many Veterans being either over opioid prescribed for their symptoms or abusing the system in getting the VA and outside medical doctors to prescribe simultaneously. The economic impact had migrated beyond simply the lost tax wage incentive when over 3.5 veterans died daily from OUD.

The Drug Enforcement Administration (DEA) website DEA.gov reflects that over 847,002,681 opioid pills were delivered to the VA from 2006 through 2014, equating to 105,875,335 opioids per year (847,002,681/8). The VA accounting of **679,376 OUD** (Figure 2) Veterans in FY Q42012 equates to 156 opioids issued to each OUD Veteran per year. There is a strong correlation between this regimented prescription protocol and the instances of TBI veterans succumbing to overdose and or committing suicide during this time. It is interesting to note, Veterans receiving prescription opioids through the VA CMOP's were simultaneously receiving opioids from their medical doctors outside the VA. There were no checks and balances in place during this time to prevent Veterans from receiving double prescriptions and dosing, further inflaming addictions and suicides with TBI Veterans. Opioid pill distribution to the VA through 2020 could not be identified in our research on the DEA.gov website.

Our conservative estimate is 1,346 Opioid Use Disorder TBI Veterans in Maryland or .33 percent of the state Veteran population (408,522/20,590,510=0.0198% x 68K= 1346 OUD Veterans in Maryland). **The economic impact on state tax revenue is estimated at \$6,251,659 and the federal income tax at \$26,770,406 per year. When we couple disability payments of \$17,967,969 and Social Security payments of \$19,382,400 together, it equates to \$37,350,369. All total an estimated \$70,372,434 yearly economic impact (\$6,251,659+\$26,770,406+\$17,967,969+\$19,382,400).** See Table 4 below.

### TBI Veteran 2021 Estimated Opioid Use Disorder (OUD) Cost Impact

(A) States	(B) Estimated State Veteran Population See Note 1	(C) Percent of Total US Veteran Population See Note 2	(D) Estimated Veteran Opioid Use Disorder (C X 68K) Note 3	(E) 2017 Median Household Income See Note 4	(F) 2018 State Tax Rate	(G) State Tax (EXF) See Note 5	(H) Income over \$38,701	(I) Federal Tax Rate/ 22% over \$38,701+\$4 453 See Note 6	(J) Social Security Tax/ 6.2% per employee See Note 7	(K) Medicare Tax/1.45% per employee See Note 8	(L) Total Federal Income Tax Collected (I+J+K)	(M) Total Veterans OUD State Income Tax Impact (D X G)	(N) Total Veterans OUD Federal Income Tax Impact (D X L)	(O) Total Veteran OUD Disability Impact (D X \$13,349.16) NOTE 9	(P) Veteran Social Security Disability Payments (D X \$14,400) Note 10
Maryland	408,522	1.98%	1346	\$80,776.00	5.75%	\$4,644.62	\$42,075.00	\$13,709.50	\$5,008.11	\$1,171.25	\$19,888.86	\$6,251,659.00	\$26,770,406.00	\$17,967,969.00	\$19,382,400.00

**Table 4**

Note 1: 2017 Veteran populations from: [https://www.va.gov/vetdata/veteran\\_population.asp](https://www.va.gov/vetdata/veteran_population.asp)

Note 2: Individual state percent determined by taking the total veteran population of each state and dividing by total US population of 20,590,510 times 100

Note 3: 20 suicides per day x 365 equals 7,300 per year (August 28, 2019, VA Secretary Wilkie announcement at American Legion National Conference). 2019 VA National Veteran Suicide Prevention Annual Report, Page 3, 16.8 suicides per day in 2017, 2.5 suicides per day for Guard and Reserves equates to 19.3 per day, US Dept of VA, "Suicide Among Veteran and Other Americans 2001-2014" Mentalhealth.va.gov, June 1, 2019.

<https://www.mentalhealth.va.gov/docs/2016suicidedatareport.pdf>

Note 4: 2017 median incomes from en.wikipedia.org

Note 5: Individual state income taxes account for 37% of state tax collections on average. Individual state tax rates from taxfoundation.org, top state marginal personal income tax rates for 2018

Note 6: Federal income tax rate based on 2018 tables and include the following: 22%=\$38,701 to \$82,500, \$4453 plus 22% of the amount over \$38,701

Note 7: 2019 Social Security tax based on 6.2% for employee and employer or 12.4% total

Note 8: 2019 Medicare tax rate based on 1.45% for employee and employer or 2.9% total

Note 9: For disability payments, we assumed 50% disability rating based on the presumption for service connection for all Veterans and states as the average stated by Hill & Ponton Disability Attorneys, 50% disability rating being married, with one child and one parent equates to 2020 VA.gov monthly payment of \$1,112.43 per month x 12=\$13,349.16 per year per Veteran.

Note 10: Militarybenefits.info reported in 2016 the Social Security Administration (SSA) official site indicated more than 600,000 Veterans received daily payments at a range of \$800-\$1800 or an average of \$1200 per month per Veteran x 12 = \$14,400

## **TBI Veteran 2021 Pharmaceutical Economic Impact**

The average cost per TBI Veteran for annual prescription cost was determined by escalating the VA quoted 2012 cost of \$723 per Veteran per year. We escalated this cost by the US historic yearly inflation rate of 3.24 percent for each year through 2021 to arrive at a conservative estimate of \$971 per Veteran per year. With an estimated 17,409 Maryland TBI Veterans,<sup>33</sup> it's estimated to be \$16,904,139 annual pharmaceutical cost. If only 49% of the Veterans are enrolled in the VA, it equates to an estimated \$8,283,028 annual pharmaceutical cost to the VA (\$16,904,139 x 49%) and the remaining \$8,621,111 (\$16,904,139 x 51%) to Maryland for subsidized pharmaceutical coverage through Medicare.

Medical examinations entail four main elements, history of symptoms, physical examination, provisional or differential diagnosis, and testing. When long-term pain was identified as a "fifth" element, it appears TBI Veterans were on the receiving end of the pharmaceutical opioid-driven pain management protocol. Veterans reduce approximately 50 percent of their medications after alternative HBOT treatment, and it represents a potential \$4,141,514 (\$8,283,028/2) economic reduction to the VA CMOP's budget and \$4,310,556 (\$8,621,111/2) reduction in taxpayer impact annually from Maryland alone. ***Over ten years, that's an estimated \$41.4 million (\$4,141,514 x 10) financial cost reduction to the VA pharmaceutical budget and \$43.1 million (\$4,310,556 x 10) to the state of Maryland.***

---

<sup>33</sup> State Vet TBI Estimate 4.261429% (Rand & VA derived) x 2016 Vet State population (Maryland 408,522) = 17,409

## TBI Veteran Economic Tax Impact

### TBI Veteran 2021 State and Local Sales Tax Estimated Economic Impact

State	(A) 2019 Sales Tax Rate	(B) 2019 Avg Local Sales Tax Rate	(C) 2019 State Combined Sales Tax Rate	(D) 2017 State Median Household Income	(E) State Tax	(F) Total Federal Taxes (Federal, Social Security, Medicare)	(G) Total Net Income (D-E+F)	(H) 50% Net Income X Combined Sales Tax Rate (C)	(I) State Veteran TBI Estimate	(J) Lost TBI Veteran Sales Tax (H X I)
Maryland	6.00%	0.00%	6.00%	\$80,776.00	\$2,406.15	\$10,207.25	\$68,162.60	\$2,044.88	17409	\$29,373,857.52

Table 5

Note 1: Sales tax sources were Sales Tax Clearinghouse, Tax Foundations calculations, State Revenue Department website

Note 2: Non-table income includes child support, certain Veteran benefits such as disability payments, welfare payments, insurance reimbursements, healthcare benefits, alimony payments

Note 3: State and local sales taxes apply with some exemptions to all goods and specific services to include tobacco, alcohol, certain foods, and motor fuels

Note 4: 411,683 Colorado Veterans x 4.261429% = estimated 17,544 TBI Veterans. State veteran TBI estimate of 4.26% is based on national estimate of 23% TBI of 2.7 million=631K who served in Iraq and Afghanistan. Veterans who served at least twice is 1.5 million x 77%=1,115,000 x 23%=256,450 + 621K=877,450/20,590,510 total US veterans=4.26% of total veteran population by state National estimate of TBI Veterans is 877,450 which was arrived at by 23% X 2.7M service members=631K service members. Two tour Veterans is over half of 2.7M an additional 1.5M service members x 77% (100-23% so we don't double count first group) =256,450 +621K=877,450 TBI Veterans in America/20,590,510 total Veterans=4.26% of total Veteran population are TBI. We applied the 4.261429% x Maryland state Veteran population to get the estimated TBI Veterans in the state.

State sales tax is based on Veterans being gainfully employed and paying taxes on goods and services. **Our estimate is \$29.3 million yearly Maryland lost sales tax revenue from TBI Veterans unemployed (Table 5).**

### Maryland TBI Veteran 2021 Estimated Homeless and Unemployed Cost

(A) State	(B) 2017 Median Household Income (See Note 3)	(C) 2018 State Tax Rate (See Note 1)	(D) State Tax X (C) (See Note 1)	(E) Income over \$38,701	(F) Federal Tax Rate/ 22% over \$4453 (See Note 5)	(G) Social Security Tax/ 6.2% per employee (See Note 6)	(H) Medicare Tax/ 1.45% per employee (See Note 7)	(I) Total Federal Income Tax Collected (F+G+H)	(J) 2016 Veteran Population (See Note 2)	(K) Estimated 2019 Number of Homeless Vets 37,085 (See Note 4)	(L) State Veteran TBI Estimate 4.261429% X (J) (See Note 8, 8A, 9, 9A)	(M) 2019 State Veteran Unemployment Rate (See Note 8B, )	(N) Unemployed Veterans Per State (J X M)	(O) Homeless Vets Lost State Revenue (D X K)	(P) Homeless Veterans Lost Federal Revenue (I X K)	(Q) TBI Vets Lost Federal Income (I x L)	(R) TBI Vets Lost State Revenue (D x L)	(S) Unemployed Vets Lost State Revenue (D x N)	(T) Unemployed Vets Lost Federal Revenue (I X N)
MD	\$80,776.00	5.75%	\$4,644.62	\$42,075.00	\$13,709.50	\$5,008.11	\$1,171.25	\$19,888.86	408,522	736	17409	0.90%	3677	\$3,418,440.32	\$14,638,200.96	\$346,245,163.70	\$80,858,189.58	\$17,078,267.74	\$73,131,338.22

Table 6

Note 1: Individual state income taxes account for 37% of state tax collections, individual state tax rates from taxfoundation.org top state marginal personal income tax rates for 2018



Note 2: Veteran populations from [va.gov/vetdata/veteran\\_populations.asp](http://va.gov/vetdata/veteran_populations.asp)  
 Note 3: 2017 household median incomes from [en.wikipedia.org](http://en.wikipedia.org)  
 Note 4: 2019 Veteran homeless data from VA.gov Point-In-Time (PIT) homeless headcount of 37,085 Column K numbers calculated by dividing state Veteran population by the total US Veteran population to attain percent times 37,085  
 Note 5: Federal income tax rate based on 2018 tables and include the following: 22%=\$38,701 to \$82,500, \$4453 plus 22% of the amount over \$38,700  
 Note 6: 2019 Social Security tax rate based on 6.2% for employee and employer or 12.4% total  
 Note 7: 2019 Medicare tax rate based on 1.45% for employee and employer or 2.9% total  
 Note 8: State Veteran TBI estimate of 4.261429% based on national estimate of 23% TBI of 2.7M=621K who served in Iraq/Afghanistan, 2<sup>nd</sup> tour Veterans 1.5M x 77%=1,115,000 x 23% TBI=256,450+621K=877,450/20,590,510=4.261429%  
 Note 8A: Estimated 19.5% TBI returning OEF/OIF Veterans + 3.5% (1/2 of 7% with mental health or TBI) =23%, RAND.org, Invisible Wounds, Mental Health and Cognitive needs of Americas Returning Veteran, 2008, Page 2  
 Note 9: Mild TBI is considered one of the signature wounds of the wars in Iraq and Afghanistan, with as many as 23% of US Veterans who served in these conflicts reporting at least one mTBI during the military service) American Journal of Epidemiology, TBI and Attempted Suicide Among Veterans of War in Iraq and Afghanistan, Volume 186, Issue 2, July 15, 2017, Pages 220-226.

If you calculate the estimated Maryland TBI Veterans homeless (736), estimated TBI Veterans total (17,409), and total Veterans unemployed (3,677), it equates to 21,822 (736+17,409+3,677) or approximately 5.34 percent of the total state Veteran population (408,522). **Maryland TBI Veterans state tax revenue loss is estimated to be \$80,858,189 annually. The federal income tax loss is estimated to be \$346,245,163 or total of \$427,103,352 (\$80,858,189+\$346,245,163). Maryland TBI Veteran homeless state income tax loss is estimated to be \$3,418,440 and federal income tax loss of \$14,638,200 for total of \$18,056,640. The total Maryland state TBI Veteran unemployed state income tax loss is estimated to be \$17,078,267 and lost TBI Veteran unemployed federal income loss of \$73,131,338 for total of \$90,209,605. Total loss from TBI Veteran homeless, TBI Veterans and TBI Veterans unemployed is \$535,369,597 (\$427,103,352+\$18,056,640+\$90,209,605) Table 6**

### TBI Veteran 2021 Vehicle Property Tax Economic Impact

(A) States	(B) Vehicle Tax Rate	© Annual Taxes on \$25K Car	(D) State Veterans with TBI Estimate	(E) Estimated TBI Veterans Non-Car Owners (30%) (D X 30%)	(F) Estimated Annual Loss of Vehicle Taxes TBI Vet Non-Car Owner (C x E)
Maryland	0.00%	\$0	17409	5223	\$0.00

Table 7

Note 1: Walletbub.com list \$24,970 is the value of a Toyota Camry LE four-door sedan as of 2/1/20, the highest-selling automobile in 2019

Note 2: Estimated TBI Veteran non-car owners calculated by taking estimated Maryland TBI Veterans 17,409 x 30% =5,223 and multiplying by estimated tax per vehicle of \$0 to arrive at a zero economic impact.

Vehicle ownership is at the core of American employment. Transportation is an essential element for veterans to attain and sustain employment. Dependency on public transportation in many cases may limit the type and location of employment, work hours, and place of domicile. Of the 877,450 estimated TBI Veterans in America, 30 percent equated to an estimated 263,235 Veterans who do not own vehicles. Of the 20,590,510 Veteran total population in America used in our analysis, Veterans not owning cars equated to a mere 1.28 percent of the total population, a very conservative estimation for this cost analysis.

In summary, TBI Veterans who don't own vehicles can be attributed to a combination of issues ranging from; need, type, and amount of prescription drugs, drug and or alcohol-related offenses. In addition, other medical conditions affect the ability to seek and attain a driver's license, i.e., unemployment, homelessness, and suicidal ideation, to name a few. This analysis did not investigate the reasons or number of Veterans not owning vehicles as the focus is conservatively estimating the economic tax impact of non-ownership by TBI Veterans. **Our conservative estimate is zero cost impact for Maryland tax revenue from non-vehicle ownership.**

### TBI Veterans 2021 Real Estate Property Tax Loss

(A) State	(B) Real Estate Tax Rate	(C) Annual Taxes on \$205K Home	(D) State Veteran TBI Estimate	(E) Estimated OEF/OIF Veterans Home Ownership (D X 34%)	(F) Estimated Annual Loss of Property Taxes TBI Vet Non-Homeowner (C x E)
Maryland	1.09%	\$2,235	17409	5919	\$13,228,965

Table 8

Note 1: Wallenthub.com depicts \$204,900 as the median home value in the US, 2018

Note 2: Column E, 2017 average Veteran homeownership, 18–34-year-olds is 34% as reported in the 2017 American Community Survey

Note 3: Data was not available at the time of this report on the exact number of TBI Veterans who own homes (It is probably more significant than shown)

Note 4: The estimated real estate tax impact of Maryland TBI Veterans was calculated by counting the number of TBI Veterans owning homes times the average annual taxes paid on \$205K residence.

We assumed that most veterans leave the service at the state median income levels, especially if they are disabled. Based on the data, we elected to be conservative in our cost assessment and use the US national median home value of \$205,000 versus the individual state median home values. The actual 2018 actual home median value was \$204,900.

column E of Table 8, the 2017 average Veteran homeownership for 18-34-year-olds is 34 percent based on the 2017 American Community Survey. This is the lowest Veteran age group that reflects homeownership on the survey. This is on the low end of Veteran age groups who own homes and is used as a conservative approach to not overstate the property tax estimate impact on TBI veterans. Second, the 18–34-year-old veteran groups are most likely to be deployed into Iraq and Afghanistan from 2001-2018, most at risk of experiencing TBIs during combat deployments. **Maryland TBI Veteran property tax loss estimate is \$13,228,965 annually.**

### **TBI Veteran 2021 Incarceration Cost Impact**

While the prevalence and impact of TBI in the prison population have not been well recognized, its influence is unmistakable.<sup>34</sup> According to the Department of Justice (DOJ) report, approximately 2.3 million people are currently being held in US prisons and jails. Of that number, the rate of TBI is high and ranges from 25% to 87% of incarcerated individuals.<sup>35</sup> In contrast, the rate of TBI in non-incarcerated adults is estimated to be lower than 8.5%.

According to the CDC, “prisoners who have had head injuries may also experience mental health problems such as severe depression and anxiety, substance use disorders, difficulty controlling anger, or suicidal thoughts and or attempts.”<sup>36</sup>

At the end of 2019, there were 1,435,500 incarcerated inmates in the US Using 8 percent as Veterans, that is 114,840 total Veterans incarcerated. The CDC indicated that 25% to 87% of inmates in prison experienced a TBI; the average equates to 56 percent. Fifty-six percent of 114,840 is 64,310 veteran inmates estimated with TBI. 64,310 incarcerated TBI Veterans x 2.0% equates to estimated 1,286 TBI Veterans. **Our conservative estimate of Maryland incarcerated TBI Veterans’ cost is \$51,295,968 per year.**

### **2015 Maryland State Prison Cost Per Inmate Per Year**

<b>(A) States</b>	<b>(B) Prison Poulation</b>	<b>(C ) Prison 2015 Reported Expenditures</b>	<b>(D) 2015 Avg Cost Per Inmate (C /B)</b>	<b>(E) 2021 Estimated Avg Cost Per Inmate (D x 3.24% x 5)</b>
Maryland	24,028	\$1,071,682,231	\$44,601	\$52,585.41

Table 9

Note1: Statistics provided <https://www.prisonpolicy.org/profiles/CO.html> & [www.vera.org](http://www.vera.org)

Note 2: US historical inflation rate is 3.24%

<sup>34</sup> Slaughter, B., Fann, J.R., & Ehde, D. (2003). Traumatic brain injury in a county jail population: Prevalence, neuropsychological functioning and psychiatric disorders. *Brain Injury*; Wald, Helgeson & Langlois, n.d.

<sup>35</sup> CDC Traumatic Brain Injury in Prisons and Jails, n.d.; Wald et al., n.d.

<sup>36</sup> CDC Traumatic Brain Injury in Prisons and Jails, n.d

Note 3: States not included in the cost per inmate statistics include Maine, Nebraska, New Hampshire, Wyoming, and Mississippi

### 2021 Maryland Estimated TBI Veteran Incarceration Cost

	(B) Estimated State Veteran Population Note 2	(C) Percent of Total US Veteran Population	(D) Total Estimated Incarcerate d Veterans Per State (C X 64,310)	(E) 2021 Average Cost to Incarcerate Veterans Per Year (D X \$39,888)
State				
Maryland	408,522	2.0%	1286	\$51,295,968.00

Table 10

Note 1: Veteran population from [va.gov.vetdata/veteran\\_population.asp](http://va.gov.vetdata/veteran_population.asp)

Note 2: The cost estimates are based on state and local inmate costs. Federal inmate costs are not included. 2% of 64,310 equals 1,286 estimated Maryland incarcerated TBI Veterans times the national average of \$39,888 per inmate per year

Note 3: Maryland average incarceration cost per year extracted from [vera.org](http://vera.org) prison spending in 2015 by state equated to \$52,585 escalated at US average inflation rate of 3.24% per year for five years which equates to \$61,674 per inmate per year.

Note 4: 64,310 is the estimated total TBI Veterans incarcerated across the US

Note 5: The national estimated average cost to incarcerate an inmate in state prison in 2020 dollars is \$39,888 which is taken from 45 state costs and averaged

### TBI Veteran 2021 HBOT Estimated Treatment Costs

There is a wide range of hyperbaric oxygen treatment costs based on the facility, civilian or military, private clinic, private or public hospital, or Wound Care Center. Additionally, 13 FDA-approved treatment protocols, each with Medicare or personal insurance coverage rates. Other considerations include the length of procedure time in the chamber and pressure used, the number of treatments required, needed medical assistance pre- and post-treatment, etc. Therefore, we did not attempt to capture all the varying treatment costs across all the variations to estimate total treatment costs for the cost analysis. Instead, we used a flat rate of \$250.00 per hyperbaric oxygen treatment hour in mono-place chambers based on varying treatment cost estimates observed and shared from private clinics across the country. The estimated cost per session decreases with economies of scale and when multi-place chambers are used. For example, if 30 people are treated at once in an enormous multi-chamber, the approximate cost is \$100 per hour.

The RAND Corporation estimates that in 2010 by investing in more evidence-based treatment, defined as *“treatments that have been proven to work*, the costs associated with PTSD and major depression would pay for itself within two years. Moreover, those treatments were even without including the costs related to substance abuse, homelessness, family strain, and other indirect consequences of mental health conditions.” Brigadier General Richard Thomas may have defined it best, “What’s been happening for a long period is that we’ve been admiring the

problem. But unfortunately, we haven't affected behaviors to get these (soldiers) the treatment they need.”<sup>37</sup>

We used an average distribution cost of \$250 per hour per hyperbaric oxygen chamber one-hour use as a mean average cost, with an average of 40 (1 Hour) HBOT dives per Veteran, which equates to \$10,000 per Veteran (\$250 x 40). With an estimated 17, 409 Maryland TBI Veterans, it's estimated to be \$174,090,000 for one-time treating 100 percent of the Maryland TBI Veterans. The current annual reoccurring Maryland cost is \$584,586,024. On a 40-year reoccurring cost basis to treatment cost, it's less than ¾ of a percent. This approach is a sound financial business case for taking the more economical approach to treating brain injury versus treating with pharmaceuticals over a veteran's lifetime.

### **Maryland Estimated 2021 Annual Reoccurring TBI Economic Societal Cost**

<b>(A) Maryland Estimated Annual TBI Impact Cost for 17,409 Veterans</b>	<b>(B) 10 Year Reoccurring Cost Impact (10 X A)</b>	<b>(C) 20 Year Reoccurring Cost Impact (20 X A)</b>	<b>(D) 30 Year Reoccurring Cost Impact (30 X A)</b>	<b>(E) 40 Year Reoccurring Cost Impact ( 40 X A)</b>
\$584,586,024.00	\$5,845,860,240.00	\$11,691,720,480.00	\$17,537,580,720.00	\$23,383,440,960.00

### **2021 Estimated HBOT Treatment Cost as Percent of Yearly Economic Cost**

<b>Total Estimated Treatment Cost for 17,409 TBI Veterans</b>	<b>Percent of Treatment Cost to 10 Yr Reoccurring Cost</b>	<b>Percent of Treatment Cost to 20 Yr Reoccurring Cost</b>	<b>Percent of Treatment Cost to 30 Yr Reoccurring Cost</b>	<b>Percent of Treatment Cost to 40 Yr Reoccurring Cost</b>
\$174,090,000.00	2.97%	1.48%	0.99%	0.74%

Table 11

### **Conclusion**

The data in this report tells a story about the economic impact of TBI veterans in Maryland. The economic impact and the humanistic toll it's having on our TBI Veterans, their families, caregivers are enormous. Calculating these total costs is outside the scope of this document. We did not consider the ripple effect costs in this review. We did not capture social security costs of families needing to enter mental health programs, secondary TBI effects given to wives and children, mental health services in the private sector, family costs to cover accidents, legal fees for divorce, child protection, civil and criminal defense, property dissolution, spouses working as caregivers, etc.

Nevertheless, the available data allows our trusted public officials to understand better the costs of failing to adequately confront the physical damage caused by untreated Traumatic Brain Injuries. Moreover, the fiscal price is only a segment of the total impact on Maryland taxpayers.

<sup>37</sup> <http://www.army.mil/-news/2011/05/01/55479-could-be-more-than-a-headache/>

“The VA estimates that the 10-year cost of caring for post-9/11 veterans with traumatic brain injury (TBI) alone will be more than \$2.4 billion from 2020 to 2029.”<sup>38</sup> Historically, TBI Veterans are more prone than their peers to suffer drug and alcohol dependencies, require caregiver support, or succumb to homelessness or incarceration.

This is not to say all TBI Veterans suffer in the same way. The point is that untreated physical brain injuries, whether diagnosed or not, cause incalculable damage. TBI Veteran costs are continuing to escalate each year substantially. The VA 2021 and 2022 submitted budget proposals reflected just how the cost is escalating every year. VA mental health, suicide, homeless program, suicide, and opioid treatment program budgets alone are escalating at a combined 107.2 percent per year or a 2021 cost of \$14.1 billion annually. In any typical business environment, the cost escalation is not sustainable or acceptable. An old tested and tried business approach states, “*what gets measured gets fixed.*” The cost analysis is designed to bring transparency and allow business discussions on how best to mitigate these enormous cost escalations. The takeaway from this report should be we can treat Maryland TBI Veterans at a fraction of the impact cost and, over a sustained period, see a significant health impact cost reduction and increase in state revenue as a result.

There is a strategic cost as well. Readiness is a term regularly applied to the United States’ ability to produce, deploy, and sustain military forces that will perform successfully in combat. Readiness is directly impacted negatively when active-duty service members cannot deploy or are deployed with degraded capabilities such as brain wounds. In our experience, combat veterans who have been exposed to IEDs, concussions, heavy artillery, shoot-room instructing, EOD, high-caliber weapons, and repetitive breaching have endured brain wounding. Since every brain wound is unique, it makes total sense that every combat veteran receives Hyperbaric Oxygenation as part of their rotation, restoration, rehabilitation, just as any weapons system goes through refurbishment.

The highly decorated TBI Veterans below tell their own stories on what path we should follow. The life cycle incurred by too many TBI/PTSD veterans is lamentable. As one Veteran put it: “The cycle is **Deny, Delay, Deceive, Drugs, Depression, and Death, the 6 D’s.**” A large fraction of our combat veterans sustain invisible injuries; they return home to the DoD and then turn to the VA for help. **The testimonials below of Veterans and their families speak for themselves; we need to listen to their compelling stories of survival and treat them with HBOT.**

[US Army BG <http://tinyurl.com/m97x4jp>]; A VA disability rating is assigned;  
[USMC GYSGT <https://bit.ly/2RYqJ4D>]; a round of pharmacology, cognitive, physical, and mental health interventions commence;

---

<sup>38</sup> Department of Veterans Affairs. (2019). Volume II, *Medical Programs and Information Technology Programs*, p. VHA-150, <https://www.va.gov/budget/docs/summary/fy2020VAbudgetVolumeIImedicalProgramsAndInformationTechnology.pdf>.

[US Army Major, <http://tinyurl.com/jts2jv3>]; drugs are prescribed;  
[USMC and US Army Lt., <https://bit.ly/3foowHU>]; caregiver family support ensues  
[MOH recipient <https://tinyurl.com/s67ryzfu>]; changing doctors and doses of drugs, including opioids, continue.  
[Navy SEAL, <https://youtu.be/kZ3TFGjbptA>]; the Veteran is unemployable  
[Mother of Army Sgt, <https://tinyurl.com/y6jaxzbx>]; prescriptions and talk therapy continue  
[SGT US Army, <https://youtu.be/DBm3k63Qhkc>]; medication problems ensure  
[USAF Ph.D., <https://tinyurl.com/4kp9d9ux>]; hospital and ER visits occur  
[SGM USMC, <https://tinyurl.com/wybes8k8>]; marriages disintegrate  
[Army Ranger, <http://tinyurl.com/hf3czmw>]; veterans become homeless  
[USAF SGT, <https://tinyurl.com/a3f9up73>]; followed, too often by either incarceration or death  
[US Army Ranger wife, <https://tinyurl.com/26ayccmy>];

**The cost-benefit analysis we developed may have duplicated TBI Veteran head counts throughout the report.** Based on the TBI/PTSD cases above, many veterans may have been counted in multiple scenarios to include unemployed, opioid use, pharmaceutical use, suicide ideation, disabled, homeless, incarcerated, and medically retired as described in the report over the decades in the progression of the symptom-based treatment protocol as described by the veteran and family testimonials

## **RECOMMENDATIONS: What must be done!**

Congress must force alignment of spending with brain-wound healing and reduce continual funding of unproven, harmful, and expensive palliatives. Instead, the law and intention must prescribe treatments with scientifically proven data, such as HBOT and other safe and effective therapies. Our solution uses existing medical facilities outside the VA to meet the needs of a medical treatment program for the hundreds of thousands of veterans suffering from brain wounds. Solutions speak directly to the current Executive Branch focus on health care, infrastructure, and efforts to end the suicide and opioid epidemics. Our recommendations include:

1. ***Employ a much less expensive, rapid, and immediately available treatment in HBOT for brain wounds that will produce positive results of “success” within months. Begin in the seven states (OK, AZ, TX, IN, KY, NC, FL) which have positively addressed the need to Treat the brain-wounded Veterans with Hyperbaric Oxygen Therapy and other Functional Medicine protocols to arrest suicides and heal wounded Veterans. Enact state legislation and fund treatments for your state TBI Veterans and seek reimbursement from the DoD/V.A. for effectively treating the Veterans***
2. ***Request the President and VA Secretary to issue an Executive Order requiring VA Administrators in each VA hospital and clinic to immediately sub-contract out for HBOT services within their communities. HBOT is already an FDA-approved protocol for Diabetic Foot Ulcers (DFU’s) and wound-healing treatment (and 14 other medical conditions), so the V.A./DoD requirement for HBOT services is already in place but not currently being deployed. The VA does over 6,000 DFU Lower Limb Amputations***

*(LLA's) annually; an estimated 50-70% could be avoided if treated with HBOT. In addition, The VA Mission Act of 2018 funds should be used to provide HBOT for TBI care since the VA does not offer HBOT care for brain wounds. [Ironically, the VA does not have HBOT chambers for Diabetic Foot Ulcers or any other 14 FDA-approved insults even though they are already on the label.*

3. **Private sector infrastructure exists to begin treating brain-wounded veterans immediately.** *Cost savings in the first year will offset high reoccurring TBI medical costs, as shown in this report. The VA should directly contract with local hospitals and clinics through a national RFP and attain Medicare pricing for HBOT treatments state by state.*
4. **Operational Service Readiness and Preparedness for all the military service branches is a national security priority.** *Unfortunately, readiness is imperiled by TBI and suicides. Suicides among active-duty and veteran service members destroy lives, cost millions of wasted dollars, sap morale, and degrade readiness. Fifty-one percent of Veterans deployed to Iraq and Afghanistan were Guard and Reserve services. They returned home to their civilian status only to be hindered by TBI/PTSD, directly impacting state tax revenues and medical costs. Treating with HBOT is medically and financially the sound business decision.*
5. **There are currently seven states which have enacted HBOT Legislation to treat TBI/PTSD Veterans.** They are OK (HB 1604), AZ (HB1512), TX (HB 271), IN (S.96), KY (HB 64), NC (HB 50), FL (HB 501), and WY (HB Resolution). States should not be required to enact State legislation to care for our TBI/PTSD Veterans. The US Veterans' Bureau War Risk Insurance Act of 1924 allows the Veterans Administration to make provisions to care for our brain-wounded Veterans. National legislation is required to require the VA to treat and fund these treatments for our wounded Veterans. Until it occurs, Governors should enact legislation and seek medical reimbursement from the V.A./DoD through existing enacted legislation.