

MARYLAND

Traumatic Brain Injury Advisory Board



2014

Annual Report

November 25, 2014

c/o Mental Hygiene Administration
Spring Grove Hospital/ Dix Building
55 Wade Avenue
Catonsville, MD 21228

The Honorable Martin O'Malley, Governor
State House - 100 State Circle
Annapolis, Maryland 21401 - 1925

Thomas V. Mike Miller, Jr., President of Senate
State House, H-107
Annapolis, Maryland 21401 - 1991

Michael Erin Busch, Speaker of House of Delegates
State House, H-101
Annapolis, Maryland 21401 - 1991

Dear Governor O'Malley, Senator Miller, and Delegate Busch:

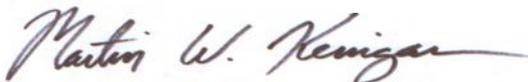
To quote a 2013 report to Congress, Brain Injury "is one of the highest priorities in public health and medicine because of its magnitude, cost, and consequences (e.g., death and disability), and because it is often preventable."

The State of Maryland must address this public health issue by improving prevention efforts and access to appropriate treatment and services. The Maryland Traumatic Brain Injury Advisory Board is required to issue an annual report to the governor and the General Assembly by § 13-2105(6) of the Health General Article in accordance with § 2-1246 of the State Government Article.

The enclosed report contains five recommendations which the Advisory Board believes represent the needs of individuals with brain injuries, their families, and communities in the state of Maryland. It is critical that the State of Maryland implement these essential recommendations, which will lead to better outcomes for individuals with brain injuries, their families and their communities and will ultimately save the state of Maryland money.

If you have any questions or require additional information, please contact me through Stefani O'Dea, Chief of Long Term Care, Behavioral Health Administration at (410) 402- 8476, or by email to stefani.odea@maryland.gov

Sincerely,



Martin Kerrigan, Chair

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Note to the Reader

We are mothers, fathers, sons, daughters, brothers, sisters, wives, husbands, employers, employees. We wear many hats. We represent every race, religion, political affiliation, and socio economic background. Some of us are young, some old, some middle aged. While we all have many differences, we all share one thing in common, brain injury! Our lives have been disrupted and altered by this event, some permanently. This event that we never thought could, or would, happen to us, until it did. What matters is that part of us was taken away when that injury happened. A brain injury can happen to anyone, at any time. It could happen to you or someone you love.

We live in a State that has some of the best medical care on the planet. Maryland's world renowned hospitals, emergency departments and doctors save lives every day, sometimes against incredible odds. If you or your loved one suffer a brain injury, Maryland hospitals increase the chances you will survive.

However, we also live in a State that still does not have a coordinated system of care to support individuals with brain injuries and their families. As a result, a disproportionate share of the long term care expenses related to brain injury fall to our state's Medicaid system. Limited rehabilitation benefits, community based supports, care coordination, and employment supports result in a higher likelihood that you or your loved one with a brain injury will reside in a nursing facility regardless of your age. There is a high rate of divorce, unemployment, substance abuse, and legal offenses following brain injury. Individuals with brain injuries are disproportionately represented in our jails and prisons. This is especially true when access to adequate and timely information and services is not available.

Individuals with brain injuries, family members and state agency and service provider representatives from around the state come together to comprise the Maryland Traumatic Brain Injury Advisory Board, and we are charged with writing an annual report that speaks to the needs of Marylander's living with brain injuries and their loved ones. While this report is certainly not all encompassing, it does represent what we believe are the most pressing issues that face Maryland and its citizens affected by brain injury. The recommendations made in this report will not make everything better for all Marylander's affected by brain injury, but it will improve life for many and it will save taxpayers and the state money.

While not all brain injuries can be prevented, the impact of many can be lessened with the implementation of these recommendations. Let's keep Maryland as one of the greatest states in the Union by making sure all of its citizens, especially those affected by brain injury, have access to the best care and services available!

Problem	Solution
Brain Injury is life altering and unexpected.	Prevention is effective
Brain Injury is complicated	Case Management/ care coordination is crucial
Brain Injury is Expensive	Timely access to rehabilitation and specialized services improves outcomes and reduces long term costs.

Increased Awareness

“Between the battlefield and the athletic field, the topic of Traumatic Brain Injury (TBI) has been much in the news in recent years. America's protracted wars in Iraq and Afghanistan, according to figures compiled by the Defense and Veterans Brain Injury Center, contributed to roughly 60,000 deployment-related diagnoses of TBI, from blasts and other causes, in US military personnel since 2000. (And that number represents only about 20 percent of the roughly 300,000 overall cases of TBI in the military during that period, due to vehicle accidents, training mishaps, and other incidents).

In the sporting world, American football has also come under scrutiny for its hazards to players old and young--from the cumulative damage of multiple concussions over a long professional career to, as the New York Times recently reported, fatal brain injuries to teenage players.

Even apart from the manifestly hazardous worlds of soldiers and contact-sport athletes, TBI represents a significant health problem in the general population. All told, workplace and household accidents, automobile crashes, assaults, and other causes account for more than 2 million emergency-room visits and contribute to upwards of 50,000 deaths per year in the USA alone.” (Huffington Post, Science, October 30, 2014 http://www.huffingtonpost.com/christopher-king/increased-public-awarenes_b_6069998.html)

Traumatic Brain Injury Data

Maryland Traumatic Brain Injury Incidence

According to the Department of Health and Mental Hygiene's Core Violence and Injury Prevention Program incidence data, during 2012:

- 706 Marylanders died as a result of a TBI
- 5,231 Marylanders were hospitalized as a result of a TBI
- 38,128 Emergency Department visits in Maryland were attributed to TBI related injuries.

Persons age 85 and older were more likely to die as a result of a TBI. Individuals age 15-24 were more likely to be hospitalized or visit an emergency department as a result of a TBI.

Unintentional falls were the leading cause of injury among those who were hospitalized with a TBI alone or in combination with other injuries or conditions. Unintentional falls were also the leading cause of injury among those who were treated and released from emergency departments with a TBI alone or in combination with other injuries or conditions. Firearm related injuries were the leading cause of TBI related death.

According to the CDC, the national annual costs associated with TBI is estimated to be \$76.5 billion. (Centers for Disease Control and Prevention, www.cdc.gov)

The average lifetime health care costs for TBI are roughly \$85,000 but can exceed \$3 million depending on severity of injury and other factors. (UAB-TBIMS, TBI INFORM 2000)

STAGGERING INCIDENCE AND TRENDS IN BRAIN INJURY IN OUR OWN BACKYARD

Traumatic Brain Injury (TBI) Medicaid costs are rising in Maryland

According to a 2012 Medicaid claims data analysis conducted by the Hilltop Institute at University of Maryland Baltimore Campus (UMBC):

- The number of Medicaid beneficiaries with TBI **increased** by 37% between 2007 and 2011, with an average of 7,287 Medicaid beneficiaries per year.
- 89% were not enrolled in any Home and Community Based Services (HCBS).
- 61% of the beneficiaries with TBI were under age 50.

Students with TBI may be under or misidentified and under served in Maryland Public Schools

- According to Maryland hospital data over 6,500 children, and youth between the ages of birth and 21 were hospitalized for a traumatic brain injury (TBI) between 2005 and 2009.
- Additional unknown numbers of children sustained TBI but were not admitted to the hospital.
- Yet, only 242 children, less than .23% of the total population of students aged 3 – 21 receiving Special Education services in Maryland are currently identified as TBI under the IDEA in 2013

There is high Prevalence of Brain Injury in Maryland Nursing Facilities

According to the July 2013 study titled, *Medicaid Expenditures for Persons with Traumatic Brain Injury while residing in Maryland nursing facilities: A follow-up Study*, the Hilltop Institute at UMBC found:

- Approximately 3,000 Maryland Medicaid beneficiaries with a history of brain injury had nursing facility (NF) stay during the Fiscal Year (FY) 2010 to FY 2012 study period.
- The prevalence rate of Medicaid beneficiaries with BI in Maryland nursing facilities was 13 percent in FY12.
- FY12 Medicaid costs for persons with a TBI and/or Anoxia diagnosis while residing in a NF were \$16,000 higher per person than those of their non-TBI diagnosed counterparts
- For nursing facility patients with TBI who had longer stays (>11 months), the average per person total annual costs were \$91,443. Higher annual costs were associated with higher non-NF costs (e.g., inpatient hospital, emergency department services, medicine). For individuals with lower annual costs, most costs are nursing facility costs.
- In FY 2012, the ratio of persons under age 65 to those 65 and older for persons with a TBI diagnosis was nearly even at 5:5; the same ratio for nursing facility users with no TBI diagnosis was 2:8. This implies that individuals with brain injury enter nursing facilities at a much younger age than individuals who have not sustained a brain injury.
- On average 16 percent of individuals who transitioned from FY 2010 to FY 2012 through Maryland's Money Follows the Person Demonstration Program had a history of TBI and/or Anoxia.

This study in its entirety can be found on the Hilltop Institute's website <http://www.hilltopinstitute.org/publications/MedicaidExpendituresForPersonsWithTBI-FollowupAnalysis-July2013.pdf>

The incidence and prevalence of TBI remains staggering and the costs associated with treatment, long term supports and indirect costs continue to rise. Advancement in medical technology and practice has resulted in greater numbers of people surviving catastrophic injuries and living with resulting deficits, disabilities, and co-morbid medical and behavioral health conditions. Falls are on the rise, especially in the growing senior population. Maryland can reduce long term state costs through prevention and timely access to effective treatment and supports.

Maryland TBI Advisory Board Recommendations

Based on available epidemiological data, Medicaid claims data, and current trends in health care and public policy, the Maryland Traumatic Brain Injury Advisory Board strongly recommends the following action steps in Maryland to address the needs and gaps in services for Marylanders with Brain Injury. The order of the recommendations does not reflect the importance of the issue. The Board feels that all recommendations are equally important.

- *Appropriately identify, assess, and provide services for children and youth with brain injuries.*
- *Expand Access to the Home and Community-Based Waiver for Individuals with Brain Injury.*
- *Expand the capacity of the Maryland licensed Chronic Hospitals, Nursing Facilities, and Home and Community-Based Services to address the neurobehavioral needs of Marylanders with brain injury.*
- *Fund the State of Maryland Dedicated Brain Injury Trust fund to support a statewide care coordination/ case management system for Marylanders with Brain Injury.*
- *Implement brain injury screening protocols with Maryland's behavioral health services, Veteran's initiatives, and home and community based services*

Appropriately identify, assess, and provide services for children and youth with brain injuries.

FACTS: In Maryland, over 6,500 children, and youth between the ages of birth and 21 were severely injured enough to be hospitalized for a traumatic brain injury (TBI) between 2005 and 2009. This total does not include the thousands of children that were seen by a medical professional, such as a pediatrician, an urgent care facility, and so forth, but were not admitted to the hospital. Despite this significant number of brain injuries in Maryland's school aged population, the Maryland State Department of Education (MSDE) reports only 242 children, less than .23% of the total population of students aged 3 – 21 receiving Special Education services in Maryland under the Individuals with Disabilities Education Act (IDEA), were receiving those services under a TBI classification code.

RECOMMENDED ACTION:

TBI can manifest itself differently in each individual. Because of this, it is often times misdiagnosed as another disability such as emotional disturbance, learning disability, or intellectual disability. Complete and appropriate screening and assessments are essential to ensure appropriate school services. Maryland is recognized as a leader in public education and its' public schools consistently rank as some of the best in the country. Other states such as Pennsylvania and Colorado have already begun implementing programs that specifically address the needs of students with brain injuries and their families. In order for Maryland schools to stay at the top, it has to take steps to address the needs of all its' students, including those with brain injuries. This board recommends that funding be added to allow the Maryland State Department of Education (MSDE) to increase public and professional awareness of brain injury, its causes and its consequences, in children and youth including the possible adverse effects on learning and behavior through improved identification and professional training. The Board suggests:

Identification/Screening:

- Include a question regarding any form of "head trauma" or loss of consciousness suffered at any time by a student during all screening processes and on required yearly School Health Forms and to develop a process or protocol for school health personnel to inform school IEP teams of students with a positive response to that question.
- Require schools to follow up with students and families at regular intervals following a concussion or suspected concussion.
- Institute mandatory sign off from a qualified medical professional on screening questionnaire that is required for all high school athletes in Maryland. The screening is currently based on self-reporting.

Professional Training:

- Provide training and information to families, students, and school personnel, throughout the state, related to brain injury utilizing resources such as the Specialized Health Needs Interagency Collaboration project already supported by MSDE. Increase the awareness of moderate and mild TBI including concussions and their prevalence in school aged children, and increase dissemination of concussion awareness trainings to school athletic departments, coaches, and trainers throughout the State educational system.
- Incorporate/emphasize “Return to Learn” as well as “Return to Play” in trainings.
- Incorporate required education regarding brain injury for teachers through staff development opportunities, continuing education, and/or during pre-service week.
- Incorporate brain injury awareness and education into parent/teacher/student association meetings.
- Create a "Brain Injury Specialist" position within MSDE to serve as liaison between MSDE, local school systems, and the medical community. This would be a pilot position that is focused in a few select counties. Duties of this position would include providing technical assistance, support, and training to the MSDE as well as to local education agencies.
- Institute a standardized system of reporting concussions, brain injuries, and suspected brain injuries to be used throughout the state. This will create a consistent protocol when a student transitions from one district to another and from one school to another.

JUSTIFICATION:

TBI can have a significant impact on classroom performance and behavior in children and youth. Recognizing this, Congress added TBI as a category for special education eligibility in 1991, and the term, as defined by the U.S. Department of Education, is codified at 34 C.F.R. § 300.8(12). Despite the existence of this category there is a significant discrepancy between TBI incidence data and data from MSDE regarding the number of school aged individuals that incur a TBI every year and the number of students currently identified as requiring educational support in schools due to a TBI. Since TBI survivors may exhibit symptoms that lead to IDEA codes of emotional disturbance, specific learning disability (SLD), or even intellectual disability, it is critical that TBI be fully understood by all involved in developing programs for students with disabilities so that all appropriate assessments, especially neuropsychological assessments, are obtained. Without proper identification and assessment, students with a diagnosis of TBI cannot be identified or served appropriately. The discrepancy between the number of known TBI cases and students with disabilities coded as TBI begs the question whether TBI is under-identified as the reason for students’ learning difficulties and, if so, why. Their ability to be successful in school and successfully transition to adulthood is compromised, and the likelihood of consuming valuable State resources in the future increases.

Expand Access to the Home and Community-Based Waiver for Individuals with Brain Injury.

FACTS: There are over 7,000 Maryland Medicaid beneficiaries living with a brain injury. Fewer than 800 of those beneficiaries are enrolled in Medicaid Home and Community Based Services. Approximately 3,000 Medicaid beneficiaries with brain injury receive services in a Maryland nursing facility each year. Total enrollment in the Maryland Brain Injury Waiver is fewer than eighty (80). Low enrollment is due to narrow technical eligibility and limited access to the program. The brain injury (BI) waiver access is limited to individuals transitioning out of four (4) state operated chronic hospital/ nursing facility settings and five (5) state psychiatric hospital settings. In Fiscal Year 2014, only nine (9) individuals have been enrolled from Western Maryland Hospital Center and five (5) additional people accessed waiver from community placement funded by the Behavioral Health Administration.

RECOMMENDED ACTIONS:

Require the Department of Health and Mental Hygiene (DHMH) to:

- Change the Brain Injury Waiver technical eligibility to a neurobehavioral needs based set of criteria rather than facility based access.
- Increase capacity through recruitment of additional specialized providers.

JUSTIFICATION:

The Brain Injury Waiver was created in response to a class action law suit against the Department of Health and Mental Hygiene because individuals with brain injury were stuck in state psychiatric hospitals due to lack of access to community based services. Eleven years later, many Marylanders with brain injury continue to experience unnecessary institutionalization but now it is commonly in nursing facilities.

Since 2007, The Department of Health and Mental Hygiene has expanded access to the BI waiver via Maryland's Money Follows the Person Project. In fact, the State of Maryland's 2008 MFP Operational Protocol declared that, "in accepting the Money Follows the Person (MFP) award, Maryland reinforced its ongoing commitment to serving individuals in the most integrated setting." However, despite this declaration, the narrow eligibility requirements have created significant barriers to the services of the BI Waiver for most Marylanders with brain injury. There are currently many otherwise qualified individuals with brain injury, who are not able to access Maryland's BI waiver services simply because their *Medicaid-paid stay* is in a nursing facility that is not state owned. A 2013 study by the Hilltop Institute at the University of Maryland, Baltimore Campus (UMBC) concluded that over 3,000 Marylanders with BI currently reside, and receive long term care services, in private nursing facilities. FY12 Medicaid costs for persons with a BI diagnosis while residing in a nursing facility (NF) were \$16,000 higher per person than those of their non-BI diagnosed counterparts. Research shows that people with brain injuries and strokes treated in inpatient rehabilitation settings had better long-term clinical outcomes than those who only receive treatment in a skilled nursing facility.

While some of the 3,000 people in the study may transition to other Home and Community Based services, many residents with brain injury will be forced to remain in institutional settings most of which are ill-equipped and ill trained to cope with their brain injury. By shifting the BI waiver technical eligibility criteria from a state-owned facility based criteria to a set of needs based criteria, qualified individuals wishing to live in the community will gain access to the specialized services offered through the BI Waiver. Access to these community based services including residential services, coordination of specialty medical care and rehabilitation services, and increased vocational supports will not only create a more cost effective method of care but also lead to a greater likelihood of improved outcomes and results.

Expand the capacity of the Maryland licensed Chronic Hospitals, Nursing Facilities, and Home and Community-Based Services to address the neurobehavioral needs of Marylanders with brain injury.

FACTS: Up to ten percent (10%) of individuals who sustain a severe brain injury require long term, intensive supports as a result of their neurobehavioral issues (BIAA/McMorrow), and those experiencing significant neurobehavioral or neuropsychiatric episodes require specialized brain injury treatment programs to ensure their safety and the safety of the communities in which they live. Maryland currently does not have a coordinated healthcare system in place to adequately meet the complex neurobehavioral needs of these extremely vulnerable individuals. As a result:

few discharge options after hospitalization/rehabilitation exist for individuals with significant medical and/or behavioral issues for younger individuals with TBI who require long term care;

there is extremely limited access to care in the months to years post injury, particularly when violent neurobehavioral issues are coupled with other conditions such as alcohol or drug addiction;

absence of care coordination within the continuum means that individuals with educated families advocate for access to best care while everyone else gets moved around within the system, do not have access to optimal care, and so experience poorer outcomes; and finally,

limited crisis intervention and clinical consultation to prevent institutionalization or promote care in least restrictive environment.

The lack of these types of specialized services increases costs for Maryland Medicaid, hospitals in Maryland with Emergency Departments, City and County Law Enforcement Systems, and the Maryland Department of Public Safety and Correctional Services, because the unmet needs result in inappropriate state paid services, unnecessary hospitalizations, and incarceration.

RECOMMENDED ACTION:

Develop a brain injury neurobehavioral level of care and specialty designation in Maryland licensed chronic hospital(s) and/ or nursing facility(s).

Create regional Neurobehavioral Centers of Excellence modeled on the current military Centers of Excellence initiative. These designated hospitals, treatment centers, or programs shall receive specialized training and enhanced reimbursement rates to provide short term, multidisciplinary intensive neurobehavioral, neuropsychiatric, and/or drug and alcohol dependency treatments for Marylanders with brain injuries showing extreme medical and/or behavioral issues.

Implement the recommendations of the Money Follows the Person Behavioral Health Committee related to improving the capacity of Home and Community-Based Services (HCBS) to support Medicaid beneficiaries with brain injury and other behavioral health issues.

JUSTIFICATION:

The behavioral changes and subsequent challenges resulting from a severe brain injury are a major impediment to the brain injury recovery process and impact an individual's ability to engage in rehabilitation, return home to family, return to work, maintain personal safety and transition out of long-term care institutional settings. Common behavioral challenges include verbal and physical aggression, agitation, limited self-awareness, altered sexual functioning, impulsivity and social disinhibition (*NASHIA, 2006*). Within one year of sustaining a brain injury, agitation and aggression typically develops in 20-49% of children and in 25-33% of adults. (*Kim et. al. 2007 & Baguley, Cooper, Flemingham 2006*). The most extreme cases have typically failed out of multiple services systems/developmental disability/TBI waiver placements, been removed from numerous skilled nursing facilities, continuously exhibited dangerous behaviors that are not re-directable and are resistant to medication treatment and behavioral interventions or had excessive numbers of emergency department visits. Those who reach this level of need have almost always depleted any personal resources they or their family may have and are reliant upon publicly funded programs, or are incarcerated as a result of their behavioral challenges.

Through development of a specific Brain Injury Neurobehavioral Level of Care, Maryland providers serving those individuals suffering severe behavioral changes/psychological challenges resulting from a brain injury will be adequately compensated for addressing all of the critical needs of these individuals in crisis. Absent this compensation, treatment will be provided, if at all, in a piecemeal, disjointed manner, resulting in incomplete recovery and prolonged and more expensive use of services.

Absent development of this level of care, people will remain "stuck" in jails, prisons, emergency departments and community hospitals because appropriate and safe discharge options are not available. Absent this level of care, Maryland has been forced to resort to paying for specialized services out of state ranging in price from \$800-\$1,200 per day (more than double average State waiver rate) for the few who manage to access those services. This solution runs counter to the Money Follows the Person philosophy of returning individuals to the community, and counter to

the fiscally responsible ideal that Maryland tax dollars serving Marylanders should remain in Maryland.

Fund the State of Maryland Dedicated Brain Injury Trust fund to support a statewide care coordination/case management system for Marylanders with Brain Injury.

FACTS: On May 16, 2013, Governor Martin O'Malley signed S.B. 632 (Chapter 511), creating the State Brain Injury Trust Fund into law. The fund is to be administered by the Department of Health and Mental Hygiene and is to be used to support services for Maryland's residents with brain injuries.

RECOMMENDED ACTION:

Recognizing that the trust fund covered services are broadly defined in legislation in regards to the scope and array of potential available services it can fund, the board strongly recommends that the Governor, the General Assembly and the Maryland Department of Health and Mental Hygiene (DHMH) allocate state general funds in the Trust Fund to support a brain injury case management program.

JUSTIFICATION:

In 2013, the Maryland Traumatic Brain Injury Trust Fund was created. While the creation of the Trust Fund was a huge accomplishment, funding and a sustainable revenue source are still needed in order for the fund to be able to pay for needed services and supports for Marylanders with brain injury as it was intended. An initial general fund allocation will allow DHMH to create a brain injury care coordination/case management program. This is one of the highest priorities of the Advisory Board as it is a well documented best practice in the field of brain injury rehabilitation as it facilitates timely access to appropriate services and supports and has the potential to reduce long term cost associated with a brain injury related disability. Case management models have been implemented by workers compensation industry and the Department of Defense for these reasons.

The benefits of case management for individuals with brain injury

- Close coordination and utilization of existing resources
- Identifying obstacles to delivery of quality, cost-effective care
- Maximizing private insurance benefits
- Accessing various community-based funds to assist with services and equipment
- Right care at the right time
- Help make "best" decisions when families and individuals with brain injury are overwhelmed
- Reduction in medical complications due to close management (wounds, behavioral health, etc.)
- Closer oversight of medical personnel improves quality of care and contains costs

- Uses their vast knowledge of existing services to meet the broad needs of the population
- Improved functional outcomes: facilitates return to community, work, ability for self-care, etc.
- Timely intervention helps contain costs and facilitates improved functional outcomes

Despite the high incidence of TBI in our state, the growing trends of TBI among our aging population, and the increased burden on the Medicaid system as a result, there is no case management system in Maryland for individuals with brain injury. Even though multiple case management programs exist in Maryland, a diagnosis of brain injury does not qualify for any of these programs thereby limiting access to this needed and cost effective service. The average cost of targeted case management per person is \$2,000 per annually.

Implement brain injury screening protocols with Maryland’s behavioral health services, Veteran’s initiatives, and home and community based services.

FACTS: John Corrigan, P.hD of the Ohio Valley Brain Injury Program at Ohio State University recently reported at a national conference of brain injury policy and rehabilitation professionals that according to recent data, including a meta analysis of 19 studies conducted by Shiroma et. al, (in press) a history of brain injury, severe enough to result in hospitalization is found among what Corrigan characterizes as “needy populations” including adults with disabilities, veterans of Operation Enduring Freedom and Operation Iraqi Freedom, incarcerated individuals, the homeless and individuals served in psychiatric and substance abuse programs. Most alarming is recent research that suggests that a history of childhood traumatic brain injury doubles the likelihood of psychiatric disorders by early adulthood. Corrigan also shared the results of a large population based study of TBI among adults in Colorado found that compared to *adults without head injuries* those with at least one TBI with a loss of consciousness were:

- 1.7 times more likely to be misusing alcohol
- 1.5 times more likely to experience mental health problems

Service Members Sustain High Rates of TBI

- From 2000 through the first quarter of 2012, at least 244,217 service members sustained a traumatic brain injury (TBI) according to the Defense Department.
- The Department of Veterans Affairs (VA) estimates that approximately 20% of the 2.3 million service members who have been deployed since September 2001 have sustained a TBI.
- In Maryland, 31,927 active duty military personnel and 12,221 reservists have been deployed since September 11, 2001. Applying the 20% incidence rate means that Maryland is currently home to 8,830 veterans and/or service members living with the effects of a TBI.
- About 45 percent of US veterans of the Iraq and Afghanistan wars who suffered traumatic brain injury are unemployed, a new report shows. (Journal of Head Trauma Rehabilitation: Post Author Corrections: October 13, 2014 Associations Between Traumatic Brain Injury,

Suspected Psychiatric Conditions, and Unemployment in Operation Enduring Freedom/Operation Iraqi Freedom Veterans)

Offender Population

- Approximately **30%** of juvenile offenders have sustained a previous TBI. (Farrer, T.J., Frost, R.B., & Hedges, D.W. Journal of Child Psychology 2013)
- Estimated prevalence of TBI in overall offender population, **60.25%**. (Shiroma, E.J., Ferguson, P.L., Pickelsimer, E.E. In Journal of Head Trauma Rehabilitation 2012)

Domestic Violence

- Greater than **90%** of all injuries secondary to domestic violence occur to the head, neck or face region(Monahan & O’Leary 1999)*Adapted from The Alabama Department of Rehabilitation Services DV Training*
- One study found that of 167 individuals treated for domestic violence related health issues, 30% experienced a loss of consciousness on at least one occasion and 67% reported residual problems that were potentially TBI related (Corrigan et.al. 2003)
- Another study demonstrated that 57 of 99 battered women interviewed had brain injured related symptomatology (Valera and Berenbaum 2003)

Behavioral Health

- Depression is the most common Axis I psychiatric disorder after TBI followed by alcohol abuse, panic disorder, specific phobia and psychotic disorders (Gordon et. al 2004)
- Between 37-51% of individuals hospitalized for TBI were intoxicated at the time of injury & have a history of alcohol misuse (Parry & Jones 2006)

RECOMMENDED ACTIONS:

Appropriate brain injury screening protocols should be incorporated into its behavioral health services, home and community based services and veteran’s initiatives. Brain injury screening is also highly recommended to better support victims of domestic violence, individuals who are homeless, and individuals who are incarcerated. When professionals working in these settings are made aware of a history of brain injury, they are then able to understand the behavior of the individual and accommodate treatment and interventions leading to more successful outcomes.

JUSTIFICATION:

Policy makers as well as clinicians need to be aware of the incidence of brain injury and the impact brain injury can have in order to ensure better outcomes and reduce costs associated with ineffective treatment. Analysis of our federal TBI Model Systems data finds “excess mortality” due to significantly increased rates of chronic health conditions and behavioral health disorders disproportionately borne by those living with brain injury. Brain injury is often not a visible disability and yet a history of a brain injury can result in significant deficits that can impact clinical outcomes, social functioning, employment, and mental health. Many individuals who have sustained a brain injury are not aware of the impact of their injuries and are unlikely to report the history of brain injury. For these reasons’ it is crucial that service providers conduct a brain injury screening with the individuals they serve. Additional information and resources can be found at the Ohio Valley Center for Brain Injury Prevention and Rehabilitation <http://ohiovalley.org/tbi-id-method/>.

Maryland Traumatic brain Injury Advisory Board- History and State Accomplishments

The Maryland Traumatic Brain Injury (TBI) Advisory Board was established in 2005 and charged with advising the State Legislature and the Governor on the impact of brain injury on the State. The Board is responsible for writing an annual report with recommendations regarding needed services and supports for individuals living with brain injury as well as prevention efforts. The Board consists of individuals with brain injury and family members, experts in the field of brain injury, professionals who work with individuals with brain injuries, representatives from state agencies, advocacy organizations, and caregivers of individuals with brain injuries. A list of Advisory Board members is attached as Appendix A.

The Board has established one standing committee, SAFE (Survivors and Families Empowered). The SAFE committee was created as a place for the members of the Maryland Traumatic Brain Injury Advisory Board who are living with a brain injury or who are family members of individuals with brain injuries, to feel support and to foster a sense of unity in board matters. One of the main goals of the committee is to ensure that individuals with brain injury and family members are active participants in Board meetings and activities.

Maryland Accomplishments:

Since the establishment of the Maryland TBI Advisory Board some progress has been made to improve the system of services and supports available to Marylanders with brain injury. Through active participation in a multitude of committees, workgroups and task forces, the Board has successfully advocated for important policy changes and decisions, including:

- Senate **Bill 632 passed unanimously in the 2013 legislative session** and was signed into law by Gov. Martin O'Malley on May 16, 2013, resulting in the creation of the Maryland Brain Injury Trust Fund. The bill passed without an identified revenue source and the established fund is not yet able to pay for needed services and supports as intended. In response to a recommendation contained in the 2011 report, DHMH agreed to modify the definition of brain injury of brain injury that is used in the Home and Community Based Services Waiver for Adults with TBI to a broader acquired brain injury definition.
- On May 19, 2011, Governor **Martin O'Malley signed a concussion bill** mandating the implementation of concussion-awareness programs throughout the state and requiring student athletes who demonstrate signs of a concussion to be removed from practice or play. An August 2013 press release highlighted new recommendations from the Maryland State Department of Education (MSDE), prompted by regulations adopted by the Maryland State Board of Education in the Spring of 2013, limiting the number of contact practices in collision sports. MSDE also recommends improved instruction by coaches in contact sports and defines interscholastic sports by types: collision, contact, limited contact, and non-contact.
- For years, **MSDE has provided scholarship opportunities** for educators and other school personnel to attend the annual Brain Injury Association of Maryland conference.
- **Board members have successfully advocated against the repeal of Maryland's motorcycle helmet law.** Multiple states have repealed only to reinstate all-rider helmet laws due to the significant increase in motor cycle deaths (Louisiana, Texas, Arkansas, Florida).

APPENDIX A Maryland TBI Advisory Board Membership

Grace Anyadike

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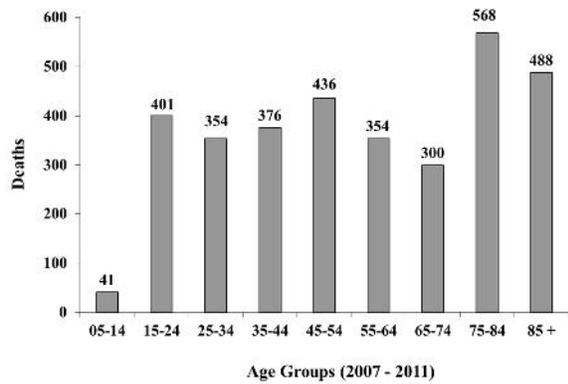
APPENDIX B Maryland TBI Incidence Data

TBI-related Fatalities, Maryland Residents, 5-year experience, 2007-2011

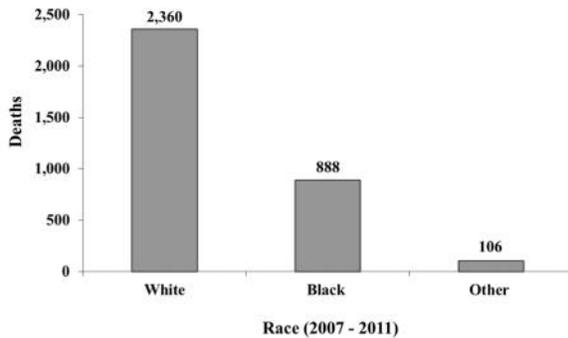
Years

	2007	2008	2009	2010	2011	07-11
Number of Deaths	730	701	715	601	610	3357
	2007	2008	2009	2010	2011	07-11
Age of Decedents*						
05-14	11	10	12	xx	8	>41
15-24	104	78	97	69	53	401
25-34	78	86	67	66	57	354
35-44	99	72	86	60	59	376
45-54	84	104	98	83	67	436
55-64	79	59	80	57	79	354
65-74	59	61	61	58	61	300
75-84	117	120	107	105	119	568
85 +	90	106	98	95	99	488

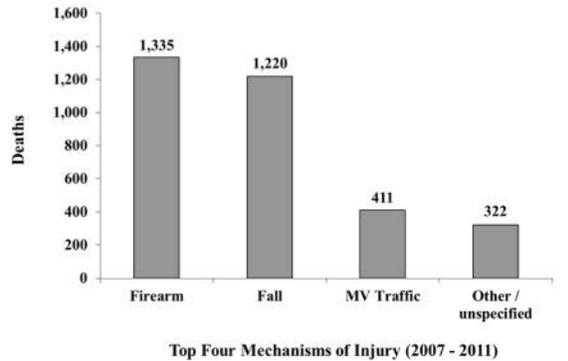
xx= cell counts suppressed to preserve confidentiality



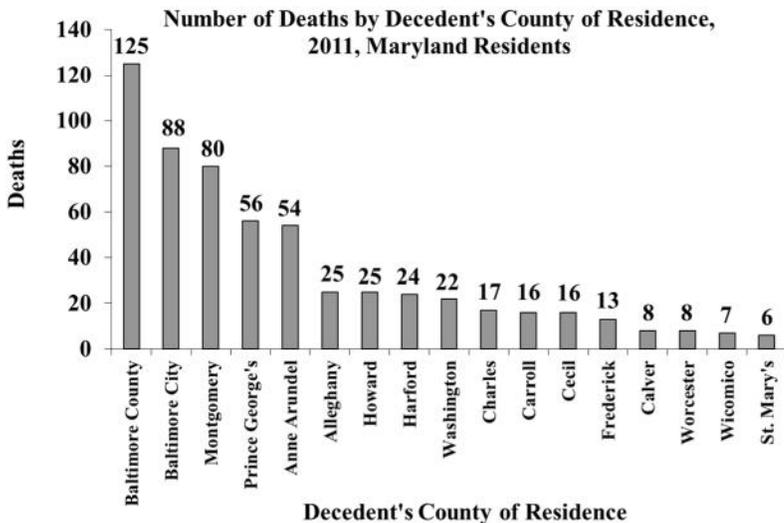
	2007	2008	2009	2010	2011	07-11
Gender of Decedents						
Female	194	202	186	148	181	911
Male	536	499	529	453	429	2446



	2007	2008	2009	2010	2011	07-11
Race of Decedents*						
White	508	493	482	430	447	2360
Black/African	205	188	199	154	142	888
Other Race	17	20	31	17	21	106



	2007	2008	2009	2010	2011	07-11
Top Four Mechanisms of Injury						
Firearm	280	282	287	233	250	1335
Fall	244	246	239	231	253	1220
MV Traffic	108	94	103	60	46	411
Other/unspecified	87	68	62	60	45	322

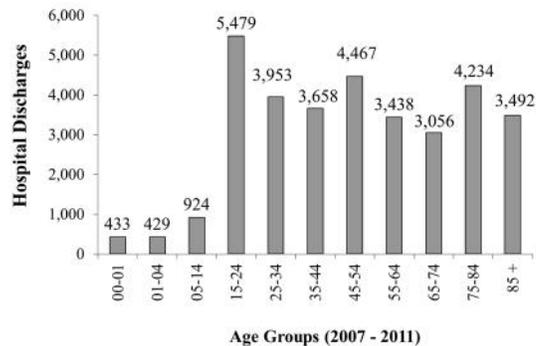


Note- The following counties had cell counts <6 and are therefore not included in the graph to preserve confidentiality: Caroline, Dorchester, Garrett, Kent, Queen Anne's, Somerset, Talbot.

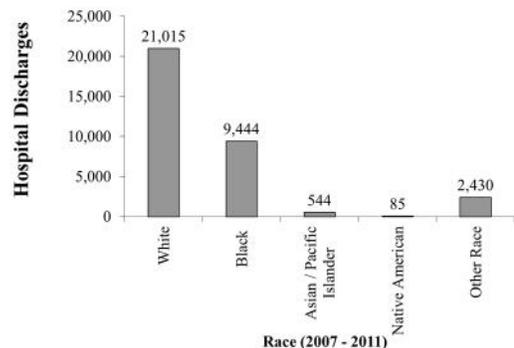
**TBI-related Inpatient Hospital Discharges (non-fatal), Maryland Residents / Maryland Hospitals,
5-year experience, 2007– 2011**

Years

	2007	2008	2009	2010	2011	07 - 11
Number of Hospital Discharges^{1,2}	7,039	7,056	6,946	5,668	6,862	33,571
Age of Injured^{1,2}						
00-00	99	95	107	67	65	433
01-04	97	93	96	68	75	429
05-14	251	191	194	148	140	924
15-24	1,322	1,238	1,045	920	954	5,479
25-34	868	878	770	700	737	3,953
35-44	877	805	750	596	630	3,658
45-54	882	944	957	755	929	4,467
55-64	640	674	710	642	772	3,438
65-74	571	605	658	508	714	3,056
75-84	827	871	898	666	972	4,234
85 +	605	662	761	596	868	3,492

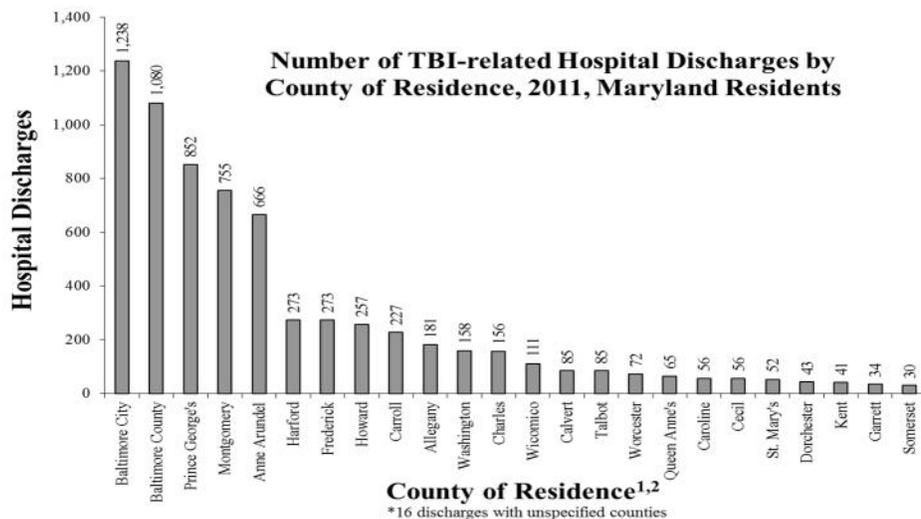
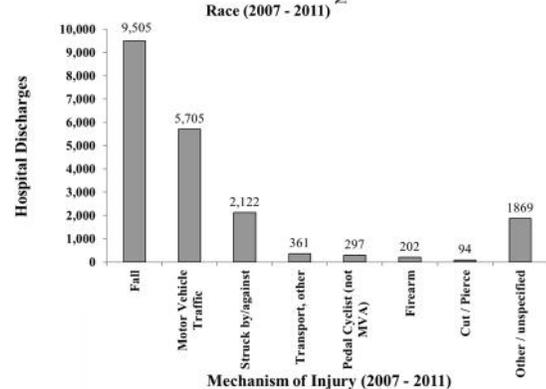


	2007	2008	2009	2010	2011	07 - 11
Gender of Injured^{1,2}						
Male	4,411	4,397	4,258	3,620	4,201	20,887
Female	2,625	2,655	2,688	2,047	2,658	12,673



	2007	2008	2009	2010	2011	07 - 11
Race of Injured^{1,2}						
White	4,417	4,433	4,308	3,491	4,366	21,015
Black/African	1,981	1,938	1,975	1,627	1,923	9,444
Asian/Pacific Islander	109	113	121	94	107	544
Native American	13	10	21	16	25	85
Other Race	498	551	513	437	431	2,430

	2007	2008	2009	2010	2011	07 - 11
Mechanism of Injury^{1,3}						
Fall	1,776	1,824	1,964	1,925	2,016	9,505
Motor Vehicle Traffic	1,427	1,256	1,100	1,022	900	5,705
Struck by/against	440	472	453	374	383	2,122
Transport, Other	92	70	68	69	62	361
Pedal Cyclist (not MV)	66	61	61	63	46	297
Firearm	35	21	34	46	66	202
Cut/pierce	31	19	9	23	12	94
Other/unspecified	404	482	427	216	340	1,869



¹All cases are discharges of persons who survived to discharge. Any hospital stay during which the victim died is not included.

²Based on cases where TBI diagnosis was identified anywhere among the several diagnoses associated with the patient's hospitalization.

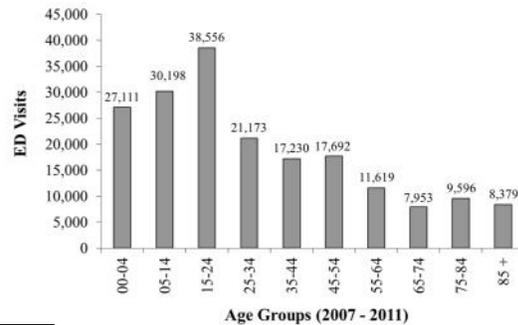
³Table is limited to case where a TBI diagnosis was the Principal Diagnosis - clearly the main reason for the hospital stay. A valid External Cause code found in the primary 'E-Code' position of the discharge record indicates the mechanism. If no valid E-Code was found, then the record was classified to the 'Other/Unspecified' category.

**TBI-related Emergency Department Visits (non-fatal), Maryland Residents / Maryland Hospitals,
5-year experience, 2007 - 2011**

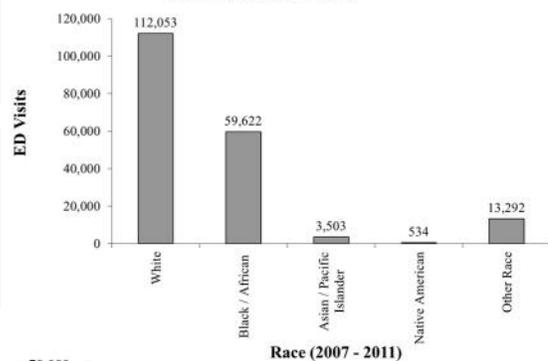
Years

	2007	2008	2009	2010	2011	07- 11
Number of Emergency Dept. Visits¹	30,867	31,980	40,725	41,472	44,472	189,516

	2007	2008	2009	2010	2011	07 - 11
Age of Injured¹						
00-04	4,667	4,718	6,128	5,714	5,884	27,111
05-14	4,907	4,921	6,641	6,465	7,264	30,198
15-24	6,461	6,601	8,216	8,404	8,874	38,556
25-34	3,361	3,596	4,451	4,690	5,075	21,173
35-44	3,042	3,086	3,668	3,658	3,776	17,230
45-54	2,726	2,909	3,779	3,988	4,290	17,692
55-64	1,684	1,833	2,521	2,676	2,905	11,619
65-74	1,216	1,238	1,683	1,790	2,026	7,953
75-84	1,547	1,671	1,983	2,108	2,287	9,596
85 +	1,246	1,410	1,654	1,979	2,090	8,379

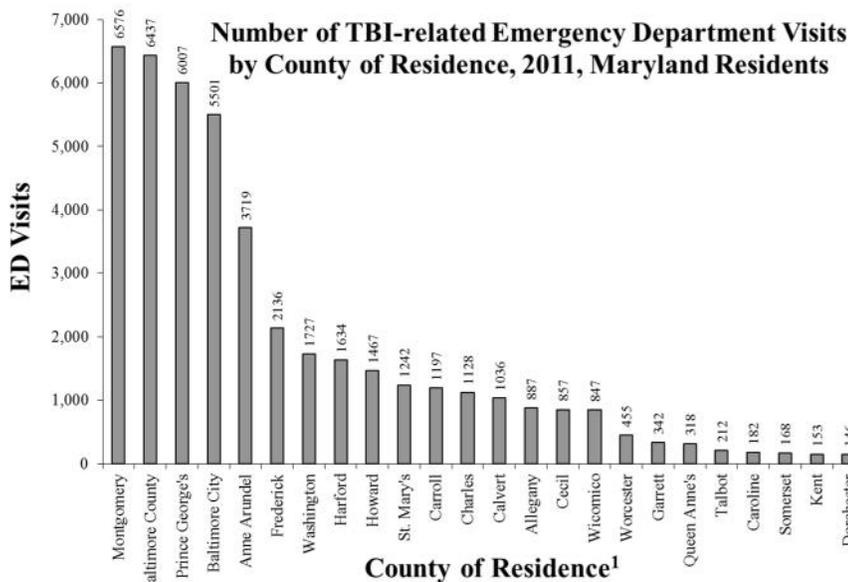
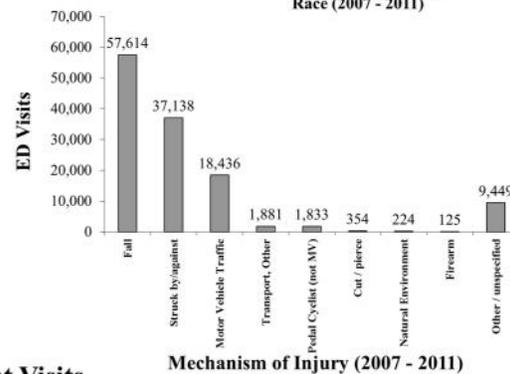


	2007	2008	2009	2010	2011	07- 11
Gender of Injured¹						
Male	17,238	17,487	21,627	21,959	23,351	101,662
Female	13,618	14,489	19,088	19,512	21,119	87,862



	2007	2008	2009	2010	2011	07- 11
Race of Injured¹						
White	18,574	18,854	24,250	24,111	26,264	112,053
Black/African	9,494	10,089	12,600	13,399	14,040	59,622
Asian/Pacific Islander	547	589	775	781	811	3,503
Native American	87	86	87	83	191	534
Other Race	2,052	2,299	2,895	2,992	3,054	13,292

	2007	2008	2009	2010	2011	07 - 11
Mechanism of Injury²						
Fall	8,940	9,253	12,910	12,987	13,524	57,614
Struck by/against	5,957	5,992	8,356	7,958	8,875	37,138
Motor Vehicle Traffic	3,084	3,142	4,010	3,924	4,276	18,436
Transport, Other	351	329	400	407	394	1,881
Pedal Cyclist (not MV)	296	333	447	349	408	1,833
Cut/pierce	50	79	60	91	74	354
Natural Environment	34	38	51	51	50	224
Firearm	38	20	29	19	19	125
Other/unspecified	2,028	1,984	2,513	1,595	1,329	9,449



¹*98 ED visits with unspecified counties

¹ Based on cases where a TBI diagnosis was identified anywhere among the several diagnoses associated with the patient's visit AND a specific Emergency Department service charge was recorded in the outpatient ambulatory care record.

² Table is limited to cases where a TBI diagnosis was the Principal Emergency Diagnosis – clearly the main reason for the visit. A valid External Cause code found in the primary 'E-Code' position of the discharge record indicates the mechanism. If no valid E-Code was found, then the record was classified to the 'Other/Unspecified' category.