Health-General § 13–2105—
State Traumatic Brain Injury Advisory Board Annual Report (MSAR #10380)

Submitted to the Maryland Department of Health

PREFACE

Every brain is different. Every brain injury is different. Every brain injury recovery is different. Therefore, it is vital to listen to various voices when determining what recommendations should be forwarded to Maryland's Governor and other policymakers. The views in this report reflect a broad range of experiences, including those of individuals with brain injuries, family members of those with brain injuries, professional healthcare providers, educators, lawyers, law enforcement members, state government representatives, and non-profit advocacy groups.

The 36 voting members each volunteer their time, energy, and expertise to the State Traumatic Brain Injury Advisory Board (TBIAB), which was initially introduced in 2005 by Senate Bill 395, Chapter 306 of the Laws of Maryland. Board members review available data and publications as well as promising practices from other states throughout the country. The TBIAB values the input of individuals who are living with traumatic brain injury (TBI)-related disability and family members who are supporting individuals with TBI. The information and recommendations in this report are intended to educate policy makers and influence state policy and do not necessarily reflect the current views of the state agencies involved.

The TBIAB is charged with investigating the needs of citizens with TBI and identifying gaps in services to citizens with traumatic brain injuries. The Board is asked to facilitate collaboration among Maryland agencies that provide services to individuals with traumatic brain injuries, and encourage community participation in program implementation.

The Maryland Annotated Code's Health-General Article (HG) § 13–2105(6) requires the TBIAB to submit an annual report summarizing the actions of the TBIAB and containing recommendations for:

1. providing oversight in acquiring and utilizing state and federal funding dedicated to services for individuals with traumatic brain injuries;
2. building provider-capacity and provider training that address the needs of individuals with traumatic brain injuries; and
3. improving the coordination of services for individuals with traumatic brain injuries.

HG § 13–2105(6) also requires the TBIAB to include information concerning the services provided and the number of individuals served in the preceding fiscal year, which is discussed in the Maryland Department of Health's (Department) report on the State Brain Injury Trust Fund under HG § 13–21A–02.

EXECUTIVE SUMMARY

Brain injury is the leading cause of injury-related death and disability in the United States. There are two categories of acquired brain injury: **traumatic or non-traumatic injury.** Each year traumatic brain injuries result in more than 3,000 hospitalizations and 11,000 emergency department visits for Marylanders of all ages.[1]

Maryland has an array of services available to individuals with disabilities; however, few are specialized for the needs of individuals living with brain injury. There is limited access to case management and misdiagnosis or under-identification of brain injury by educators and human service professionals. There are clinical service gaps to support individuals who experience neurobehavioral issues following a brain injury.

The TBIAB's recommendations for Maryland are intended to address these service gaps and reduce the public health burden of brain injury through appropriate resource linkage, training, effective screening practices, and availability of specialized services. The recommendations are as follows:

I. Appropriately identify children and youth with brain injuries.
II. Implement brain injury screening protocols and offer treatment accommodations to individuals receiving behavioral health services (mental health and substance use disorders) and to those charged with a crime and/or incarcerated in jails and prisons.
III. Expand and improve services offered through the Maryland Brain Injury Waiver.
IV. Increase funding to allow implementation of the Maryland Brain Injury Trust Fund program.
V. Establish a central, publicly available repository of TBI surveillance data to ensure that Marylanders who sustain these injuries and their families are provided information and linkage to available resources and assistance.

[1] Data Source: Health Services Cost Review Commission Maryland Department of Health Center for Environmental, Occupational, and Injury Epidemiology, Traumatic Brain Injury (TBI)-related Emergency Department (ED) Visits and Hospitalizations: Maryland 2016–2021 (Aug 22, 2023). Data Source: Health Services Cost Review Commission

UNDERSTANDING BRAIN INJURY

WHAT IS AN ACQUIRED BRAIN INJURY?

An ABI may occur from a traumatic injury or a non-traumatic injury or disease and affects individuals of all ages. A non-traumatic brain injury may be caused by strokes, infections of the brain such as viral encephalitis, brain tumors, and loss of oxygen to the brain which may be caused from a heart attack, choking, near drowning, drug overdose, carbon monoxide poisoning or other anoxic or hypoxic conditions.

WHAT IS A TRAUMATIC BRAIN INJURY?

A Traumatic Brain Injury (TBI) is caused by external forces to the brain including motor vehicle crashes, motorcycle and scooter crashes, falls, assaults, sports injuries, explosive blasts, gunshot wounds to the head, objects falling on the head, and sharp objects penetrating the skull.

CAUSES OF BRAIN INJURY

The human brain can be injured in many ways.

Most people are aware of brain injuries caused by:

- Contact sports
- Blast injuries that occur during military conflict.

Brain injury can also be caused by:

- Penetrating gunshot wounds to the head,
- Motor vehicle crashes and bicycle crashes both driver and pedestrian.
- Falls, a significant problem among our growing aging population.

Some of the underrecognized causes of brain injury include those resulting from:

- Intimate partner violence,
- Childhood physical abuse,
- Lead poisoning,
- Drug overdose(s),
- Long-term neurocognitive and neuropsychiatric complications from the coronavirus disease 2019 (COVID-19) outbreak, or Long Covid[2].

SEVERITY OF INJURY

"Severity of injury" refers to the degree or extent of brain tissue damage. Brain injury may be classified as mild, moderate, or severe, depending on the individual's neurologic signs and symptoms.[3] The degree of damage is estimated by measuring the duration of loss of consciousness and coma, length of amnesia (memory loss), and brain scans.[4]

---

[2] Manukyan P, Deviaterikova A, Velichkovsky BB, Kasatkin V. The Impact of Mild COVID-19 on Executive Functioning and Mental Health Outcomes in Young Adults. Healthcare (Basel). 2022 Sep 28;10(10):1891. doi: 10.3390/healthcare10101891. PMID: 36292338; PMCID: PMC9601355.
Monje M, Iwasaki A. The neurobiology of long COVID. Neuron. 2022 Nov 2;110(21):3484-3496. doi: 10.1016/j.neuron.2022.10.006. Epub 2022 Oct 7. PMID: 36288726; PMCID: PMC9537254.

[3] Model System Knowledge Translation Center, online at https://msktc.org/.

[4] Brain Injury Association of America, online at https://www.biausa.org/brain-injury/about-brain-injury/basics/injury-severity.

Table. Degree of Damage to the Brain

Severity of Injury	Percentage Affected	Signs and Symptoms
Mild TBI or concussion	80% of all brain injuries-characterized by no loss of consciousness or a loss of consciousness (LOC) of less than 30 minutes and/or a period of confusion referred to as post traumatic amnesia (PTA) of less than 60 minutes	• Vomiting,dizziness, lethargy • Memory loss for the period immediately, before and after the injury and difficulty attending to and learning new information during this time period (PTA)
Moderate TBI	10–13% of all brain injuries-characterized by LOC of 30 minutes to 24 hours, and PTA of 1–24 hours	• Signs of brain injury including bleeding, contusions • Period of time (PTA) where memory and learning are impacted is longer than after a mild TBI • Signs of brain injury evident on a CAT scan or other neuroimaging assessments
Severe TBI	7–10% of all brain injuries-characterized by LOC and PTA greater than 24 hours	• Unconsciousness (coma) for over 24 hours, can last days, weeks, months, or years • No sleep/wake cycle during period of coma • Signs of brain injury evident on a CAT scan or other neuroimaging assessments

The majority of individuals who present with a "mild" traumatic brain injury or concussion recover within two weeks. However, some individuals with mild brain injury experience a complicated course of recovery. A complicated recovery is especially true when individuals have incurred **multiple** mild brain injuries. The populations where multiple mild brain injuries are common include those who have served in the armed forces, athletes, victims of intimate partner violence,[5] and children who are exposed to abuse. Although it is rare for individuals to have long term negative consequences of a single mild TBI, multiple mild traumatic brain injuries can result in increased levels of disability with each mild injury incurred, especially if they occur within close proximity to each other.[6]

SYMPTOMS & RECOVERY

Each individual's presentation of symptoms and recovery varies widely despite the severity of brain injury. Therefore, it is essential to note that the functional deficits in the areas of cognition, physical abilities, and behavioral health vary from person to person depending on

[5] Clendenen, Partner-inflicted brain injury: recognizing invisible injuries and finding hope for healing (March 19, 2020), online at https://www.futureswithoutviolence.org/Partner-Inflicted+Brain+Injury.

[6] Vynorius, Paquin, Seichepine, Lifetime Multiple Mild Traumatic Brain Injuries Are Associated with Cognitive and Mood Symptoms in Young Healthy College Students (October 31, 2016), online at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5086577/.

a variety of factors, including; age at the time of injury, appropriate and timely access to medical care, and access to support and services.

Brain injury symptoms can consist of impaired mobility, coordination, dexterity, memory, learning, attention, sleep, and sense of sight, hearing, vision, taste, and/or smell. Additional reported symptoms are headaches, fatigue, mood disorders, and post-traumatic epilepsy. Approximately twenty percent of individuals with a history of TBI develop a post TBI seizure disorder, which in turn worsens behavioral outcomes.[7]

PREVENTING TRAUMATIC BRAIN INJURY

The TBIAB exists to ensure effective treatment and rehabilitative services for those affected by TBI. However, it is equally as important from a public health perspective, to identify and decrease risk factors to prevent TBI and its associated disability. Prevention strategies to reduce the likelihood of sustaining a brain injury include, but are not limited to wearing a seatbelt when driving or riding in a motor vehicle; securing children ages zero to eight in a child safety seat;and wearing a helmet or appropriate headgear when playing contact sports, biking, motorcycling, snowmobiling or riding a scooter.

Additionally, older adults should talk with their physician about evaluating their risk for falling, assess their home for fall-related hazards, have regular eye exams. and have their pharmacist review their medications for fall risk.

For young children, it is important to ensure play areas are safe , install window guards to keep young children from falling out of windows, use safety gates at the top and bottom of stairs, and choose playgrounds with soft material underneath. For more information on preventing TBI please visit the Centers for Disease Control and Prevention (CDC) website.[8]

While not commonly associated with reducing brain injury, other prevention efforts are equally important such as substance abuse and overdose prevention, intimate partner violence resources, infection prevention, pedestrian safety awarenss, and suicide prevention efforts. Individualizing practices within the behavioral health profession to screen for a lifetime history of brain injury as well as targeted prevention and outreach to individuals with brain injury would reduce the rate of substance abuse among individuals with brain injury, and reduce the chance of overdose related brain injuries.

---

[7] Semple, Zamani, Rayner, Shultz, Jones, Affective, neurocognitive and psychosocial disorders associated with traumatic brain injury and post-traumatic epilepsy (2019), online at https://research.monash.edu/en/publications/affective-neurocognitive-and-psychosocial-disorders-associated-wi.

[8] CDC Traumatic Brain Injury & Concussion, Prevention (last reviewed Dec 5, 2023), online at https://www.cdc.gov/traumaticbraininjury/prevention.html.

BRAIN INJURY INCIDENCE DATA

NATIONAL INCIDENCE DATA[9]

Brain injury is a preventable public health issue. It is the leading cause of injury-related death and disability in the United States. According to the Center for Disease Control and Prevention:

- 214,110 TBI-related hospitalizations in 2020 (586 per day).
- 69,473 TBI-related deaths in 2021 (190 per day).
- People aged 75+ had the highest rates/numbers of TBI-related hospitalizations and deaths, accounting for 32% and 28% of TBI-related hospitalizations and deaths, respectively.
- Males are two times more likely to be hospitalized and three times more likely to die than females. Children (birth to age 17) had 16,070 TBI-related hospitalizations in 2019 and 2,774 TBI-related deaths in 2020.
- These data do not include TBIs treated in emergency departments, primary care, urgent care, or those that are untreated.

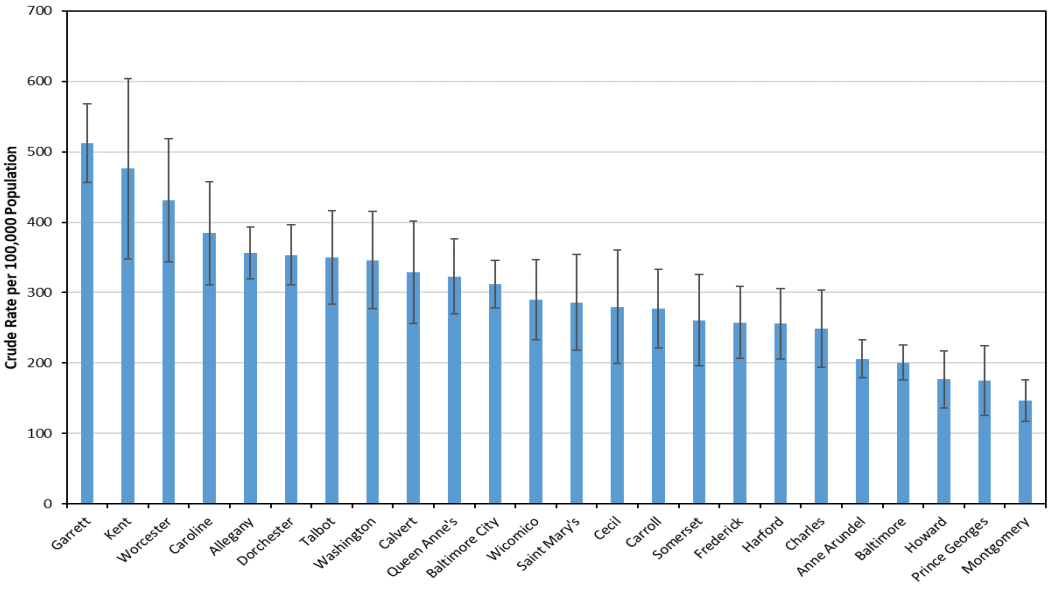
MARYLAND INCIDENCE DATA[10]

According to the Maryland Department of Health (MDH) Center for Environmental, Occupational, and Injury Epidemiology, in Maryland in 2021, there were: 3,481 TBI related hospitalizations and 11,962 TBI related ED visits.

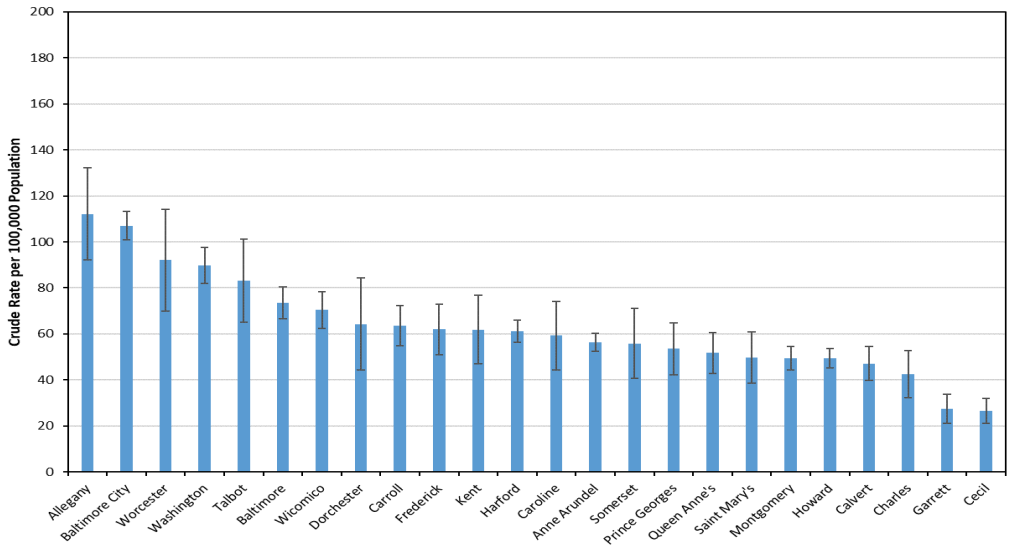
[9] https://www.cdc.gov/traumaticbraininjury/data/

[10] Maryland Department of Health Center for Environmental, Occupational, and Injury Epidemiology, Traumatic Brain Injury (TBI)-related Emergency Department (ED) Visits and Hospitalizations: Maryland 2016–2021 (Aug 22, 2023). Data Source: Health Services Cost Review Commission

Mean annual rate[11] of TBI related ED visit by county of residence, Maryland 2016-2021



Mean annual rate of TBI related hospitalizations by county of residence, Maryland 2016-2021



Number and rate of TBI related emergency department visits and hospitalizations by age group, Maryland 2021

- The highest rate of emergency department visits occur for 15-24 year olds while the highest rate of hospitalizations occur for 75-84 year olds

[11] Age-adjusted rate (per 100,000 population).

- Sixty-three percent of TBI related hospitalizations in Maryland occur for individuals 55 and older, while 73% of TBI related emergency department visits occur for Marylanders under the age of 55.

Age group (years)	*2021 Maryland TBI related* ***ED visits***	*2021 Maryland TBI related* ***Hospitalizations***
	n (rate)	***n (rate)***
<1	133 (2.7)	38 (0.8)
1-4	291 (5.6)	21 (0.4)
5-14	1,419 (27.0)	35 (0.7)
15-24	2,556 (45.7)	229 (4.1)
25-34	1,910 (31.5)	341 (5.6)
35-44	1,307 (25.7)	311 (6.1)
45-54	1,090 (18.8)	284 (4.9)
55-64	1,128 (11.8)	508 (5.3)
65-74	897 (9.8)	564 (6.2)
75-84	705 (10.8)	620 (9.5)
85+	521 (6.8)	528 (6.9)
Total	11,962 (2308.6)	3,481 (56.4)

UNCAPTURED AND UNDERREPORTED DATA

Most brain injuries are underrepresented and not reflected above because reporting is only required for TBIs treated in hospitals. Many people who experience a mild brain injury, otherwise known as a concussion, receive medical care from a physician's office or urgent care center, or perhaps receive no medical attention at all. We also do not know how prevalent brain injury related disabilities are in MD because prevalence data is not currently collected.

Also, missing from these data are other acquired causes of brain injury that do not fall under the TBI diagnosis. These causes of acquired brain injury (ABI) include near drowning, suffocation, strokes, and opioid-related overdoses and other unintentional poisonings, intimate partner violence and brain damage caused by COVID-19 and other viruses.

Although the data are not yet available, MDH now includes several "state-added" brain injury questions to the annual Behavioral Risk Factor Surveillance System (BRFSS) questionnaire in 2021. Those data are not yet publicly available. The BRFSS is the nation's premier system of health-related telephone surveys that collect state data about U.S. residents regarding their health-related risk behaviors, chronic health conditions, and use of preventive services.[12]

BRAIN INJURY SCREENING

Throughout this report, screening for a history of brain injury is recommended for students, individuals receiving behavioral health services, someone charged with a crime and incarcerated individuals, those receiving home and community-based services, veterans, individuals experiencing homelessness, and individuals who have experienced intimate partner violence.

Screening for a history of brain injury is important because many injuries to the brain are unreported or untreated. Even when an injury is treated, the long-term consequences and the secondary impact of the injury on the social determinants of health may be unknown.

Simple, validated screening tools can be completed within minutes and do not have to be administered by a clinician with an advanced degree. Screening can identify a possible lifetime exposure to brain injury that can inform the need for specific brain injury clinical assessment and interventions as well help guide both service providers and the individual as to what kinds of structure, support and accommodations will help them to better engage in and benefit from treatment and rehabilitation services.

Several brain injury screening tools exist.[13] The MDHBehavioral Health Administration, Maryland's lead agency on Brain Injury, has implemented a modified version of the Ohio State University TBI Identification method into certain services.[14]

LATEST BRAIN INJURY RESEARCH

PSYCHIATRIC COMORBIDITIES

Psychiatric comorbidities have a huge impact on neurobehavioral issues following a brain injury[15]. The location of injury is directly tied to the array of symptoms demonstrated. For example, disturbances in neurotransmitters (serotonin, glutamate, dopamine) can also create depressive symptoms in individuals living with TBI . General tissue injury is linked

[12] Eagye, Whiteneck, Harrison-Felix, Report on Methods to Estimate Traumatic Brain Injury Prevalence and Home and Community Based Services Use by State, Traumatic Brain Injury Model Systems, National Data and Statistical Center, Craig Hospital (September 30, 2019), online at https://static1.squarespace.com/static/5eb2bae2bb8af12ca7ab9f12/t/5f6e46b9853fc630b55bdbb8/1601062591214/ACL+Report+on+TBI+Prevalence+and+HCBS+by+State+FINAL.pdf.

[13] NASHIA Resource List, online at https://www.nashia.org/resources-list?category=Screening%20Tools.

[14] Screening for TBI Using the OSU TBI-ID Method, The Ohio State University Wexner Medical Center, online at https://wexnermedical.osu.edu/neurological-institute/departments-and-centers/research-centers/ohio-valley-center-for-brain-injury-prevention-and-rehabilitation/for-professionals/screening-for-tbi.

[15] Brain Injury Assoc. of America et al. The Essential Brain Injury Guide. Edition 5.0, Revised.

to other chronic neurobehavioral problems such as anxiety, mania, panic disorders, Post Traumatic Stress Disorder (PTSD), schizophrenia, and personality disorders.
he key to achieving a successful rehabilitation outcome for those with co-occurring brain injury and psychiatric conditions:

- Integration of mental health services as part of the rehabilitation plan,
- Inclusion of specific strategies designed to address psychological issues,
- Assist the person with the brain injury to become more aware of their brain injury related deficits
- Support through family psychoeducation and referral to Brain Injury support groups and other resources, critical to maintaining family connection to the individual
- Access to neuropsychiatric and behavioral support services if there are aggressive or problematic behaviors that compromise an individual's ability to participate in rehabilitation. These specialized brain injury services are especially helpful in terms of ensuring prescription of medication, brain injury informed counseling and recommendations of compensatory cognitive strategies and accommodations that can aid in the process of adjusting to disability and self-management of psychiatric conditions and resulting behaviors[16].

SERVICES, SUPPORTS, AND GAPS IN MARYLAND

Maryland has an array of services available to individuals with disabilities; however, few are specialized for the needs of individuals living with brain injury. Services and supports that are currently available to Marylanders who sustain a brain injury include: trauma and emergency services, inpatient and outpatient rehabilitation, long-term services and supports (both institutional services such as home- and community-based and nursing facility services), special education services and educational accommodations for students, behavioral health services, case management, and active support from advocacy organizations.

The gaps in Maryland largely revolve around the absence of available services within many geographic areas in the state and the lack of coordination and specialization of these services and supports. Further complicating these issues are: limited access to case management, misdiagnosis or under-identification of brain injury by educators and human service professionals, and inadequate clinical services to support individuals who experience neurobehavioral issues following a brain injury

In the 2023 Annual TBI Advisory Board survey, employment supports and caregiver support were noted as unmet needs. See Appendix A for additional details related to services and service gaps.

VOCATIONAL REHAB & SUPPORTED EMPLOYMENT

History of brain injury is associated with challenges in obtaining and maintaining employment. Emphasizing the vocational aspects of rehabilitation while individuals are hospitalized or receiving outpatient services is very important to facilitate work and

[16] Murray B. Stein et al. Risk of Posttraumatic Stress Disorder and Major Depression in Civilian Patients After Mild Traumatic Brain Injury A TRACK-TBI Study. *JAMA Psychiatry*, 2019 DOI: 10.1001/jamapsychiatry.2018.4288

community reintegration. Factors to consider are: environmental modifications to address accessibility barriers, identification of specialized services like supported employment and vocational services. Also of importance, is facilitation of return-to-work with an understanding toward what accommodations or modifications may be necessary.

The Division of Rehabilitative Services (DORS) is an agency of the Maryland State Department of Education. DORS is composed of the public vocational rehabilitation (VR) program and the Disability Determination Services. DORS has counselors throughout the state who are specially trained to work with people with acquired brain injuries.

Several Maryland Home and Community Based Services Waivers that provide services to Marylanders living with brain injury offer supported employment services to help individuals obtain and maintain competitive employment.

CAREGIVER BURNOUT & ASSOCIATED IMPAIRMENTS

The adverse effects of an acquired brain injury are not just limited to the individual. Caregivers of people with brain injury report stress, grief, loss and may also experience adverse health effects, including stress-related disorders and depression.[17] In addition, in taking on the role of caregiver, family members can experience a loss of income as they may drop out of the workforce in order to provide unpaid care to their loved one[18].

Social, cognitive, and behavioral impairments following brain injury can impact psychological distress for family caregivers based on family functioning and the individual's ability to participate in work and independent living skills.

Additional factors have an impact on caregivers. Caregivers reported a decline in their quality of life from pre-injury levels. Caregivers reported a perceived lack of:

- **instrumental supports** (e.g., help from others in caring for loved ones, getting enough rest or sleep, attending to one's own needs, respite care)
- **professional supports** (e.g., resources for loved ones, resources for oneself)
- **emotional supports** (e.g., preparing for the worst, discussing feelings about the loved one with someone having similar experience, help getting over fears and doubts about the future, and being reassured that it is usual to have strong negative feelings about the loved one)[19]

MARYLAND ACCOMPLISHMENTS[20]

Since the establishment of the TBIAB, progress has been made to improve the systems of services and supports available to Marylanders with brain injury. Through active

[17] Brickell, French, Lippa, and Lange, Burden among caregivers of service members and veterans following traumatic brain injury, vol. 32:12 (August 27, 2018), online at https://www.tandfonline.com/doi/abs/10.1080/02699052.2018.1503328?journalCode=ibij20.
[18] Humphreys I, Wood RL, Phillips CJ, Macey S. The costs of traumatic brain injury: a literature review. Clinicoecon Outcomes Res. 2013 Jun 26;5:281-7. doi: 10.2147/CEOR.S44625. PMID: 23836998; PMCID: PMC3699059.
[19] Brain Injury Association of America. The Essential Brain Injury Guide. 2019.
[20] See Appendix B, *infra* pp. 29–30, for more information about Maryland Brain Injury accomplishments.

participation in a multitude of committees, workgroups and task forces, the TBIAB has successfully advocated for policy changes, including:

- Creation of the State Dedicated Brain Injury Trust Fund,
- Support of the concussion bill, resulting in better return to play and learn among children and adolescents who incur a TBI through organized sports,
- Implementation of meaningful changes to the Brain Injury Waiver,
- Integration of a brief brain injury screening protocol for certain public behavioral health services, and
- Support for Maryland's motorcycle safety laws, including the helmet law (maybe cite that law here).

RECOMMENDATIONS FOR MARYLAND

The recommendations in this report are intended to reduce the public health burden of brain injury through appropriate resource linkage, training, effective screening practices, and availability of specialized services.

Appropriately identify children and youth with brain injuries.

The State of Maryland shall improve identification of students with brain injuries by:

- Requiring local education agencies to add three questions, designed to capture incidence of brain injury or loss of consciousness suffered at any time by the student, to the special education identification process.

Why is this important?

Brain injury often has a significant impact on the development and functioning of an individual. This is especially true in the developing brains of children and adolescents. Difficulties with problem solving, impulsivity, memory, new learning, and self-regulation are some of the common sequelae of brain injury and represent just some of the serious and potentially lifelong consequences of TBI. The CDC 2018 Report to Congress[21] includes information and tools for healthcare providers, educators, parents, and students to assist with acute medical management of brain injury in children as well as recommendations for long-term monitoring and transition to school. The report demonstrates evidence of the relationship between long-term disability and behavioral health conditions that impact functional achievements in adulthood, highlighting the importance of timely, appropriate intervention with children.

Recently, the under identification of students with lasting TBI sequelae is gaining more attention nationally and several states are considering how to best address this problem. According to MDH, in 2021 alone, there were 2,718 ED visits and 134 hospitalizations for

[21] CDC National Center for Injury Prevention and Control, Division of Unintentional Injury Prevention, Report to Congress: The Management of Traumatic Brain Injury in Children (2018), online at https://www.cdc.gov/traumaticbraininjury/pdf/reportstocongress/managementoftbiinchildren/TBI-ReporttoCongress-508.pdf.

Marylanders ages 0–18 years old with a diagnosis of TBI.[22] This total does not capture the full extent of brain injury among this population, as it does not include those seen by private practitioners, in urgent care facilities, or those who did not seek medical care following a brain injury. It also most likely does not capture most incidences of "mild" and "moderate" brain injury, even though the effects from these types of brain injuries can have long term impact on an individual's cognition and functioning. Additionally, this data is most likely not a true indication of the scope of the problem as both hospitalizations and ED visits have had a significant decrease since the beginning of the COVID public health crisis. Prior to the onset of COVID in 2020, the numbers were consistently over 4,000 ED visits and 185 hospitalizations yearly Despite the number of severe brain injuries reported among school-aged children, there are currently only 197 Maryland students identified as requiring special education services as the result of a traumatic brain injury.[23] This is 0.18% of the total population of students currently receiving special education services in Maryland schools.

Under-identification of brain injury may occur because TBI symptoms can be misinterpreted as other disabilities, such as emotional disability and learning disability which may lead to inappropriate individualized education plans with goals and objectives that do not fully address the student's actual needs. Improved identification of TBI through the creation and use of screening will help increase the likelihood that: (1) students who were not previously identified as having a brain injury will receive further assessments to determine their need for additional services, supports, and accommodations; (2) screening evidence will guide and inform the selection of appropriate assessments for students identified as having a TBI; and (3) services, supports, and accommodations will be individually determined based on an appreciation of the students' history of TBI and an interpretation of their assessment results.

According to a 2017 study published by the National Institutes of Health, the effects of TBI on cognition, emotional functioning and behavior are well known, but educational professionals sometimes fail to connect learning and other problems to a TBI. This delayed recognition of TBI may "lead to unnecessary chronic and disruptive problems in activities and participation" including learning and school.[24]

Effective and timely TBI identification is a crucial and inexpensive tool that can be used to avoid delayed diagnosis and treatment of children who have incurred a TBI. Early diagnosis leads to early treatment and often reduces or eliminates the need for longer term treatment and its associated costs. This is especially true when discussing the child's educational performance.

Additionally, by providing appropriate interventions and supports, the child with TBI is more likely to have better performance in school, decreased negative behaviors, and overall, more positive long-term outcomes.

---

[22] Maryland Department of Health Maryland Department of Health Center for Environmental, Occupational, and Injury Epidemiology, Traumatic Brain Injury (TBI)-related Emergency Department (ED) visits and Hospitalizations.

[23] Maryland State Department of Education's 2022 Special Education Census.

[24] Van Heigten, Renauld, and Resch, The role of early intervention in improving the level of activities and participation in youths after mild traumatic brain injury: a scoping review, Concussion, 2017 Nov; 2(3): CNC38. Published online 2017 Aug. 10. DOI: 10.2217/cnc-2016-0030.

In 2019, legislation designed to study identification practices was introduced in the Maryland House of Delegates. The proposed legislation did not make it out of committee in the Senate.[25]

Implement brain injury screening protocols and offer treatment accommodations to individuals receiving public behavioral health services and those charged with a crime (juveniles & adults) and/or incarcerated in jails and prisons.

MDH should:

- Convert the TBI screening questions that are currently built into the public behavioral health service authorization process for two mental health services to mandatory responses (they are currently optional questions); and

- Expand these questions to public behavioral health service authorization workflows for other mental health services.

Why is this important?
Individuals who sustain a brain injury have increased risk of developing a mental illness, a substance use disorder, become incarcerated, and/or experience homelessness. Most individuals who sustain a brain injury in Maryland will not receive services from a specialized brain injury program or provider. Most will either receive no services, or receive services from systems or programs that are designed for other diagnoses or disabilities. The unique constellation of deficits that can result from a brain injury are often misinterpreted as malingering or non-compliance. In fact the individual receiving services may be struggling with cognitive, physical or behavioral challenges that interfere with their ability to engage with and benefit from services. Research suggests that awareness of a possible brain injury in someone's history, and implementation of simple strategies and supports can greatly enhance treatment outcomes.

MDH has implemented both brain injury screening and accommodations training for behavioral health providers. It has incorporated a brief brain injury screening into the online BHASO? authorization process for certain behavioral health services, *e.g.*, psychiatric rehabilitation and mobile treatment, in early 2017. The screening questions are based on the Ohio State University TBI Identification Method (OSU TBI-ID) quick screen. These questions are currently optional and should be required for these services as well as other publicly funded behavioral health services. The screening questions are:

- Ever knocked out or lost consciousness? (yes, no, not screened)
- Longest time knocked out? (less than 30 minutes, 30 minutes-24 hours, more than 24 hours)
- When were you first knocked out or lost consciousness? (Age in years: 1-99)

---

[25] See General Assembly of Maryland, HB0708, online at http://mgaleg.maryland.gov/webmga/frmMain.aspx?pid=billpage&stab=01&id=hb0708&tab=subject3&ys=2019RS (House Bill 708, Education—Identification of Students with Traumatic Brain Injury—Study and Report, received a favorable vote (138–0) on the House Floor); General Assembly of Maryland SB0778, online at http://mgaleg.maryland.gov/webmga/frmMain.aspx?pid=billpage&stab=01&id=sb0778&tab=subject3&ys=2019rs. (Senate Bill 778 received an unfavorable report by the Education, Health, and Environmental Affairs Committee).

The answers to these questions are predictive of future onset of mental illness, substance misuse, and legal offenses.

Expand and improve services offered through the Maryland Brain Injury Waiver[26]

The Maryland Department of Health should improve the quality and quantity of resources for people with complex needs resulting from brain injury by:

- Modifying the eligibility for the Brain Injury Waiver to allow access from private nursing facilities; and
- Studying the *Individual Support Service (ISS)* rate to determine what increase is needed to promote utilization of this waiver service.
- Expand services to underserved counties in MD.

Why is this important?

Maryland's Brain Injury Waiver was created twenty years ago in response to a class action lawsuit. MDH created the program as a resource for adults with TBI who were ready to discharge from State Psychiatric Hospitals, but lacked community discharge resources. This population, who were largely court involved individuals and had lengthy institutional stays, needed expensive services that include the availability of 24 hour supervision and support, including awake overnight supervision. Due to the specialty nature of these services, as well as the cost of the services, enrollment in the program has historically been limited to individuals transitioning from certain institutional settings including state psychiatric hospitals, certain chronic hospitals, and out of state facilities serving Marylanders with brain injury whose care needs could not be supported by programs in state.

Maryland's Brain Injury Waiver program, intended to be small due to the cost of the services, has expanded by approximately 10 waiver slots per year over the past two decades. Some traditional institutional access points have closed or been downsized so referrals to the program have decreased. As a result, the program does not enroll the full number of people each year that it is approved to serve. There are 155 approved waiver slots in fiscal year 2024 and 120 people have been served through the program so far. MDH temporarily expanded the institutional access points for this program to include skilled nursing facilities in September 2022. This temporary expansion was implemented using a flexibility that was available during the public health emergency. With the end of the public health emergency in May 2023, this flexibility ended six months later in November 2023.

The TBIAB acknowledges and commends the MDH for the recent decision to temporarily expand access to this program, utilizing an emergency authorization process, to individuals residing in private nursing facilities and encourages MDH to make this change permanent, understanding that MDH must study the impact of this eligibility change to determine if it is feasible and sustainable in terms of federal requirements. Unless the change is made

[26] Maryland's Home and Community Based Services Waiver for Individuals with Brain Injury is a Medicaid program that provides community-based services to individuals with brain injury as an alternative to care in an institutional setting such as a nursing facility or chronic hospital.

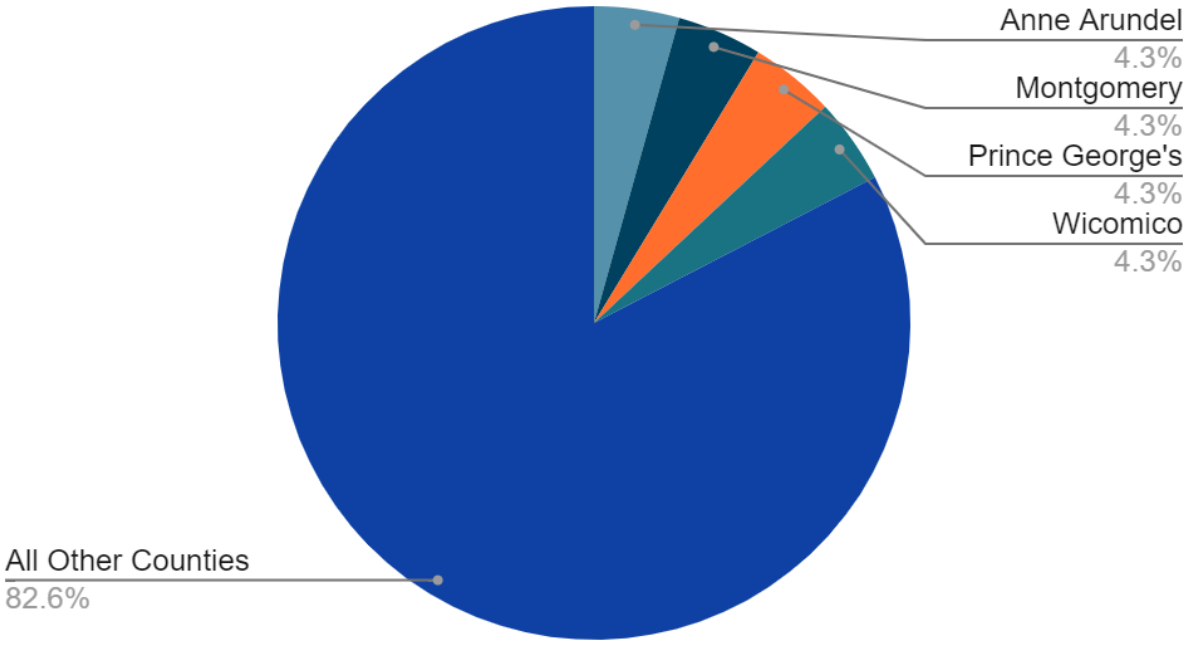
permanent, access to this important resource will be severely hampered and as a result the program will be underutilized and people who need the services will not be able to get them.

While this flexibility was put in place in September 2022 through November 2023, the number of people enrolling from Nursing Facilities increased, providing a valuable community resource to individuals who have disability resulting from a brain injury and whose brain injury cannot be adequately treated within those facilities.

Jack is a 51 year old man who suffered two strokes. After his second stroke, he was no longer able to reside at home with his daughter and was admitted to a nursing facility. Jack experienced the loss of 3 friends in a year, which led to depression. The public health related flexibilities allowed him to discharge from the nursing facility to the brain injury waiver program, where he now lives with people closer to his age and has more staff support than he did in the nursing facility. As a result, he has made significant progress with improving his walking. His daughter and granddaughter enjoy their visits with Jack and his roommates. Now that Jack is more independent with transferring and walking, his daughter and granddaughter can pick him up and take him out. He recently attended his first Orioles game in over five years.

Historically, brain injury waiver service utilization has been highest for residential and day habilitation services, costly services with limited provider capacity. Affordable housing initiatives—such as Bridge Subsidy, HUD 811, and Weinberg and Mainstream Housing—have become increasingly available since the implementation of Maryland's Money Follows the Person Demonstration. Over the course of the Covid-19 public health emergency, some participants chose to leave congregate living settings where residential habilitation services are provided and live with family instead. Overall costs to the State for participants who have transitioned to independent housing is on average less than half of that for participants living in a provider-owned or controlled residential setting. Approximately 22% of brain injury waiver participants live in independent housing or with family. Access to the *Individual Support Service (ISS)* available through the brain injury waiver has been limited by the shortage of support staff available post pandemic, the inadequate rate associated with the services, as reported by Brain Injury Waiver providers, and by the limited pool of brain injury providers statewide. This convergence of participant needs and preferences with affordable housing opportunities has created a priority for the Department to address in terms of rate of reimbursement and service and network adequacy.

Expanding services to underserved counties is a crucial step towards improving the BI Waiver's success. There are currently only four approved Brain Injury Waiver providers and their base locations are located in only 4 of Maryland's 23 counties. When families learn that their loved ones will need to live in another part of the state to be able to take part in services, many decline or are unable to access needed services. A geographic distance can often be too stressful for the family and the participant.



John is a 45 year old father of 2 young children. He incurred his brain injury at the age of 42, from a fall. He had a stay at a chronic rehab hospital after his injury and then transitioned to a nursing facility in a county near his family. The public health related flexibilities allowed access to the brain injury waiver program from nursing facilities. John has been with the brain injury waiver program for one year and although his family has to drive further to visit with him, they are able to visit in a comfortable home like environment with a yard which allows his kids to roam and play. John has his own room in the home versus his small shared room in the nursing facility. John's roommates are much closer to his age than the residents of the nursing facility were and they are much more active.

Increase funding to allow implementation of the Maryland Brain Injury Trust Fund.

The State should support a system of coordinated case management and support services for people with brain injury who are not eligible for Maryland's Brain Injury Waiver Program by:

- Allocating appropriate state general funds to the Trust Fund;
- Implementing a system to provide services set forth in statute.

Why is this important?

Pursuant to HG § 13–21A–02(i), MDH is required to submit a report on the State Brain Injury Trust Fund, including the number of individuals served, and the services provided in the preceding fiscal year using the fund. Since the passage of Senate Bill 632, Chapter 511

of the Acts of 2013, MDH has accrued, as of the time of this report, $266,482 (as of July 2023) through the voluntary vehicle registration donation program. The MDOT created a voluntary donation option for vehicle registration transactions completed via kiosk or online. Monthly revenue into the fund increased beginning in April 2021 when the Maryland Department of Transportation changed the $1 donation increment to any dollar amount, per the recommendation of the TBIAB and the Trust Fund Advisory Committee.

The TBIAB is very appreciative of the efforts of legislators and state leaders at the Maryland Department of Transportation (MDOT) and MDH for the creation of a revenue source for Maryland's Brain Injury Trust fund and for the recent change in allowable donation amounts. Donations are transferred to Maryland's Brain Injury Trust fund, managed by MDHBHA. Revenues are not yet sufficient to support the types of services identified in the law.

MDH has established a Trust Fund Advisory Committee to advise and assist with developing a list of covered services, service descriptions, program and provider requirements, and conditions for client participation. This committee projects that revenue should reach $500,000 to begin efficient operationalization of service provision. This would provide approximately 50 Marylanders with brain injury 10 hours of case management/ support services per week. Currently, 24 states have created brain injury trust fund programs and the annual revenue of Maryland's trust fund lags behind that of other states.

If adequately funded, this fund would provide services to individuals with a medically documented brain injury with incomes ≤ 300% of the federal poverty level who are in need of case management and other support services and not otherwise eligible for services under Maryland's Brain Injury Waiver.

Establish a central, publicly available repository of TBI surveillance data and ensure that Marylanders who sustain these injuries and their families are provided information and linkage to available resources and assistance.

MDH should ensure that aggregate TBI surveillance data and TBI resources are publicly available and can be utilized for prevention efforts, resources allocation, education, resource linkage, and advocacy. MDH should also ensure that individuals with brain injury and their families are linked with available resources.

Why is this important?

Under HG § 20–108, established more than 25 years ago, each Maryland hospital is required to report to MDH within seven days of the occurrence of a "reportable condition", such as a TBI. Further, MDH within 15 days of receiving a report of an individual with a reportable condition, is to notify the individual or the individual's parent or guardian of any assistance or services that may be available from the State and of the eligibility requirements for such assistance or services. This unfunded mandate has not been operationalized and it is important to examine current state resources to determine an effective way to ensure that TBI surveillance data is captured and that individuals in need of resources are linked to them.

The importance of linkage cannot be overstated. Depending on the complexity of their injuries, individuals and families are often overwhelmed by cognitive, physical, and emotional challenges that accompany a moderate or severe TBI. Ideally, information about the nature and availability of supports should be conveyed to individuals with brain injury and caregivers at all points along the treatment and discharge process, from hospital admission through and including the time at home post-discharge, but these connections are not always made. Often individuals return home and do not know where to look or even what they need in order to access services. Even if they receive information at the hospital about post-acute and community-based services, they might not access such services immediately or at all. The individual may lose or be unable to retain the information provided, or they may believe that they will not need to access any services as life and functioning will return to their pre-injury levels. An individual's support system might also have difficulties navigating services. Many times an individual with TBI has no support system at all at a time when they may have an increased need for community-based services.

TBIAB is appreciative of the Department's efforts to accomplish this important work and will continue to monitor the Department's progress.

MARYLAND BRAIN INJURY RESOURCES

Governor TBI Advisory Board

Website for TBIAB reports, meeting minutes, and manual
https://bha.health.maryland.gov/Pages/mdtbiadvisoryboard.aspx

Advocacy, Information, and Assistance

Brain Injury Association of Maryland
www.biamd.org

Maryland Lead Agency of Brain Injury

Maryland Department of Health, Behavioral Health Administration
https://bha.health.maryland.gov/Pages/Traumatic-Brain-Injury.aspx

Legal

Disability Rights Maryland
https://disabilityrightsmd.org/

MARYLAND TBIAB MEMBERSHIP

Membership of the Maryland TBIAB is set forth in HG §§ 13–2101 through 13–2105. Membership consists of individuals who have sustained a brain injury, family members and caregivers, advocacy organizations, professionals working in the field of brain injury treatment and rehabilitation, Maryland state agencies, and two members of the Maryland state legislature. Half of the membership is appointed by the Governor, and half is appointed by the directors of the agencies that are required by statute to serve on the board.

TBIAB has established Survivors and Families Empowered (SAFE), a standing committee. The SAFE committee was created as a place for the members of the Maryland TBIAB who are living with a brain injury or who are family members of individuals with brain injuries to obtain support and 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. This committee has served as a national best practice for incorporating lived experience into the work of the TBI advisory Boards and Councils.

Board Membership

Gil Abramson, Esq
Baltimore, MD

Jeronica Baldwin
Office of Health Services,
Baltimore City

Sandra Bastinelli
Representing Individuals with Brain Injury
Carroll County

Jody Boone
Division of Rehabilitation Services
Baltimore City

Joan Carney, Ed.D.
Brain Injury Association of Maryland
Baltimore City

Joyce Dantzler
Office of Healthy Homes and Communities, Maryland Department of Health
Baltimore City

Norma Eisenberg
Representing Families and Caregivers of Individuals with Brain Injury
Howard County

Laurie Elinoff
Representing Individuals with Brain Injury, Statewide Independent Living Council
Anne Arundel County

Janet Furman
Developmental Disabilities Administration, Maryland Department of Health
Baltimore City

Thomas Gallup
Representing Families and Caregivers of Individuals with Brain Injury
Montgomery County, MD

Amanda Gallagher, MA CCC-SLP
Professional
Baltimore City

Andrew (Drew) H Gantt III
Brain Injury Association of Maryland
Baltimore county, MD

Martin Kerrigan, Chair
Brain Injury Association of Maryland
Howard County

Marny Helfrich, M.Ed.
Maryland State Department of Education, Division of Special Education, Early Intervention Services Baltimore City

Lorri Irrgang
Representing Individuals with Brain Injury
Anne Arundel County, MD

Norda Kittrie
Representing Families and Caregivers of Individuals with Brain Injury
Montgomery County, MD

Cory Kovacik, OTR/L
Sinai Hospital
Baltimore City

Carole A. Mays, RN, MS, CEN
Maryland Institute for Emergency Medical Services Systems
Baltimore City

Claudette Mathews, RN
Office of Genetics and People with Special Health Care Needs

Kara Melcavage
Representing Individuals with Brain Injury
Baltimore City

Stefani O'Dea
Behavioral Health Administration, Maryland Department of Health
Baltimore County

Bryan Pugh
Brain Injury Association of Maryland
Baltimore City

Gabriel H. Rubinstein, Esq.
Disability Rights Maryland
Baltimore Maryland

Mellissa Ruff, LCSW
Representing Families and Caregivers of Individuals with Brain Injury
Baltimore City

Lisa Schoenbrodt
Loyola University of Maryland
Speech Language Hearing Science
Baltimore City

Lt. Stephen Thomas
Law Enforcement
Anne Arundel County

Adrienne Walker-Pittman
Representing Individuals with Brain Injury
Baltimore City

Heather Wheeler, PT, DPT
University of Maryland
Rehabilitation and Orthopedic Institute
Baltimore County

Maryland Legislative Appointments (ex-officio)

Senator Nancy J. King
Democrat, District 39, Montgomery County

House of Delegates,
Vacant

Staff to the TBIAB

Mawada Hassan, MHS
Brain Injury Association of Maryland

APPENDIX A

DESCRIPTION OF MARYLAND SERVICE SYSTEMS

SERVICE AREA	AVAILABLE SERVICES	SERVICE GAPS
Trauma Care[27]	Emergency care for TBI is provided by Maryland's Institute for Emergency Medical Services System (MIEMSS), a coordinated statewide network that includes volunteer and career emergency medical system providers, medical and nursing personnel, communications, transportation systems, trauma and specialty care centers, and EDs.	Many individuals who sustain TBI, such as a concussion, do not seek treatment in these settings. They often see treatment in a physician's office or an urgent care center or seek no treatment at all. As a result, a TBI can be undiagnosed or misdiagnosed and the impact of the injury and resulting deficits underestimated, leading to lack of adequate follow up and supports. *See recommendation #4 Trust Fund.*
Brain Injury Rehabilitation	Maryland offers inpatient and outpatient rehabilitation services, accredited by the Commission on Accreditation of Rehabilitation Facilities (CARF), for inpatient and outpatient rehabilitation facilities and programs.	The lengths of stay4 in inpatient facilities has decreased significantly over the years, and it is now increasingly more common for individuals with brain injury to receive rehabilitation in a nursing facility (no nursing facilities have specialized brain injury programs) or to have little or no access to rehabilitation services. *See recommendation #4 Trust Fund and #3 Brain Injury Waiver.*
Case Management	Case management is defined by the Centers for Medicare and Medicaid Services as a service that helps eligible people gain access to needed medical, social, educational, and other services. Maryland's Medicaid case-management services, which are provided under a number of programs, vary in name and	Maryland only offers case management to those enrolled in home- and community-based services, including targeted case management for individuals with mental illness. Most Marylanders with brain injury are not enrolled in those Medicaid programs. The lack of case management limits timely

[27] MIEMSS, 2018–2019 Annual Report, online at https://www.miemss.org/home/Portals/0/Docs/AnnualReports/Annual-Report-2019.pdf?ver=2020-10-07-145042-713.

	scope and are offered by a variety of providers. Case management has been demonstrated to help reduce readmissions to hospitals and improve rehabilitation outcomes.	access to appropriate services and supports and thereby negatively affects clinical outcomes. *See recommendation #4 Trust Fund*.
TBI Registry	Maryland law, set forth in HG § 20–108, makes "head injury" a "reportable condition." Each hospital is required to report to the Department within seven days of the occurrence of a reportable condition. The Department is required to establish a central registry to compile information about disabled individuals with reportable conditions and within 15 days of receiving a report of an individual with a reportable condition, notify the individual or the individual's parent or guardian of any assistance or services that may be available from the State and of the eligibility requirements for such assistance or services. Upon request from the individual, the Department shall refer the individual to appropriate divisions of the Department and other agencies, public or private, which provide rehabilitation services for persons with reportable conditions.	This statute was not implemented, and hospitals are not currently reporting "head injuries" to the Department. This gap in reporting, compiling, and notification is negatively affecting the lives of every Maryland family dealing with brain injury. As a result, individuals and family members receive limited to no information and resources when the opportunity for recovery afforded by access to appropriate care is most critical. The long-term negative impact affects public health at the systemic level as well as the lives of individuals with brain injury and their families. *See recommendation #5 TBI Registry*.
Home- and Community-Based Services	Services are provided in an individual's home or in the community as an alternative to care in an institutional setting, such as a nursing facility. Maryland operates eight Medicaid-funded home- and community-based waiver programs, including one designed	Private or commercial insurance does not cover home- and community-based supports that assist individuals with remaining at home and also prevents admission to nursing facilities for long-term care. Medicaid does cover these home- and community-based services.

	for individuals with brain injury, and five additional programs that offer personal care and other supports.	However, in a 2012 study conducted by the Hilltop Institute at University of Maryland Baltimore County, of the approximate 7,000 Maryland Medicaid beneficiaries who had sustained a TBI, only 11% were enrolled in home- and community-based services. *See recommendation #3 Brain Injury Waiver*.
Brain Injury Waiver	There is one home- and community-based program in Maryland designed specifically for individuals with brain injury. It is a small specialty program designed to support individuals with moderate to severe deficits resulting from their injuries, who meet the financial, medical, and technical eligibility for the program.	Eligibility for the Brain Injury Waiver currently is based on "facility-based access," meaning it is limited to individuals transitioning out of four state-operated chronic hospital or nursing facility settings and five state psychiatric hospital settings. This limits access to the program for individuals who are in need of this level of support but do not reside in one of those institutional settings. *See recommendation #3 Brain Injury Waiver*.
Behavioral Health Services	Maryland has integrated mental health services and substance-related disorder services. These conditions frequently occur in conjunction with, or as a result of, a brain injury. The cognitive, emotional, and behavioral symptoms that result from brain injury can impact the effectiveness of traditional behavioral health services.	Behavioral health providers do not routinely screen the individuals they serve for a history of a brain injury. This often leads to misdiagnosis, under-identification, and insufficient supports and services for both children and adults. *See recommendation #2 Screening*.
Special Education Services	The Individuals with Disabilities Education Act (IDEA) requires schools to protect the rights of	There is a significant discrepancy between the number of school-age children being treated in

children with disabilities and ensure these students have access to free and appropriate education. IDEA covers children with specific disabilities, including TBI.

Maryland hospitals for a TBI and the number of Maryland students receiving special education services with a diagnosis of TBI. This under-identification or misidentification may occur because TBI symptoms overlap with symptoms of other disabilities, including emotional disturbance and learning disability as defined by the IDEA. Incorrectly diagnosing students and failing to recognize TBI is likely to lead to inappropriate individualized education programs because the goals and objectives do not address the student's unique needs. *See recommendation #1 Students*.

APPENDIX B

MARYLAND ACCOMPLISHMENTS

Advocacy

The Brain Injury Association of Maryland is the only advocacy organization geared specifically to individuals with brain injury. Two additional advocacy organizations, the Centers for Independent Living and Disability Rights Maryland, the State's protection and advocacy organization, provide assistance to individuals with disabilities, including brain injury. All three of these organizations are represented on the TBIAB. The Brain Injury Association in conjunction with TBIAB hosted a brain injury awareness day event in March 2019 in Annapolis to educate legislators about brain injury in honor of Brain Injury Awareness Month (March). A press conference was held announcing the creation of the new Brain Injury Trust Fund donation program.

Brain Injury Trust Fund

The Maryland Brain Injury Trust Fund was created during the 2013 Legislative Session without a revenue stream but, in December 2018, a voluntary donation program was created at the Maryland Department of Transportation. Now Marylanders renewing their vehicle registration online or at a kiosk can donate to Maryland's Brain Injury Trust Fund. This is a notable accomplishment; however, it is also important to note that the revenues generated through this program are too low to support the initiation of services.

Concussion Law

On May 19, 2011, the concussion bill was signed into law, 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.

Helmet Law

Board members have successfully advocated against the repeal of Maryland's motorcycle helmet law. Multiple states (*e.g.*, Louisiana, Texas, Arkansas, and Florida) have repealed only to reinstate all-rider helmet laws due to the significant increase in motorcycle deaths.

Federal Grant Funding

BHA was awarded a three-year federal TBI grant creating the STAR model: (1) **Screen** individuals receiving behavioral health services for a history brain injury; (2) **Train** behavioral health/ human service to provide cognitively accessible services and interventions utilizing person centered practices; (3) **Activate/Support** stakeholders; and (4) **Reduce** the risk of overdose for Marylanders who have sustained a brain injury.

APPENDIX C

The Maryland Traumatic Brain Injury Advisory Board is partnering with the Brain Injury Association of Maryland (BIAMD) to highlight Marylanders with brain injuries the Board

was created to represent. As part of BIAMD's Unmasking Brain Injury 2.0 project, Marylanders with brain injuries and their caregivers were asked to create masks to help us put a face on this "invisible epidemic". The individuals created masks to represent their journey and then were asked to tell their story and describe their masks.

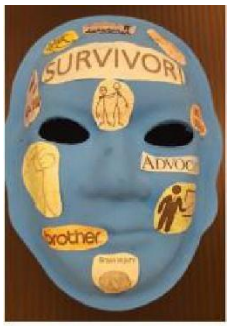
Please scan the QR codes with your smartphone or tablet with your camera app to see a brief YouTube video and let the individual personally tell you their story and describe their mask.

Laurie E.
Motor Vehicle Accident

SCAN ME

Sandra B.
Skiing Accident

SCAN ME



Martin K.
Hit by a Car

SCAN ME