United States Government Accountability Office

Report to Congressional Committees

June 2020

DOMESTIC VIOLENCE

Improved Data Needed to Identify the Prevalence of Brain Injuries among Victims

GAO-20-534

GAO Highlights

Highlights of GAO-20-534, a report to congressional committees

June 2020

DOMESTIC VIOLENCE

Improved Data Needed to Identify the Prevalence of Brain Injuries among Victims

Why GAO Did This Study

Research has found brain injuries to be common among victims of intimate partner violence, and that such injuries are under-diagnosed and under-treated.

House Report 115-952 included a provision for GAO to report on the relationship between intimate partner violence and brain injuries. GAO (1) describes efforts to provide education, screen for, or treat brain injuries resulting from intimate partner violence; and (2) examines what is known about the prevalence of brain injuries resulting from intimate partner violence, including HHS efforts to determine prevalence. GAO reviewed peer-reviewed literature, federal websites, and documentation from HHS and DOJ. GAO also interviewed officials from HHS, DOJ, and 11 non-federal stakeholders, such as domestic violence organizations. GAO identified 12 initiatives, though this list may not be exhaustive, and conducted site visits to three of them.

What GAO Recommends

HHS should develop and implement a plan to improve data collected on the prevalence of brain injuries resulting from intimate partner violence and use these data to inform its allocation of resources to address the issue. HHS concurred with our recommendation and is coordinating with its agencies to augment data collection.

View GAO-20-534. For more information, contact Carolyn L. Yocom at (202) 512-7114 or yocomc@gao.gov.

What GAO Found

According to the Centers for Disease Control and Prevention (CDC), one in three adults have experienced domestic violence, also known as intimate partner violence. Intimate partner violence includes physical violence, sexual violence, stalking, and psychological aggression. Victims of intimate partner violence may experience brain injury, resulting from blows to the head or strangulation. To address this issue, the Department of Health and Human Services (HHS) and the Department of Justice (DOJ) provide grants to state and local entities that work with victims.

GAO identified 12 non-federal initiatives that provide education, screen for, or treat brain injuries resulting from intimate partner violence. All 12 developed and distributed education and training materials to domestic violence shelter staff, victims, health care providers, and others. Six of the 12 initiatives used screening tools to identify potential brain injuries among intimate partner violence victims, and two included a treatment component. Additionally, eight of the 12 initiatives received HHS or DOJ grant funding, although agency officials told us the funding had no specific requirements to address brain injuries resulting from intimate partner violence.

Excerpt of Educational Materials from Ohio Domestic Violence Network

Source: Ohio Domestic Violence Network. | GAO-20-534

Based on its review of the literature, as well as interviews with HHS officials and other non-federal stakeholders, GAO found that data on the overall prevalence of brain injuries resulting from intimate partner violence are limited. HHS officials acknowledged that the lack of data on the prevalence of these issues is a challenge in addressing the intersection of the issues. However, HHS does not have a plan for how it would collect better prevalence data. HHS agencies have some related efforts underway; however, the efforts are limited and generally do not examine the connection between brain injuries and intimate partner violence. Enhancing the health and well-being of Americans is critical to HHS's public health mission. As part of this mission, CDC, within HHS, uses its Public Health Approach, which includes collecting prevalence data to understand the magnitude of public health issues.

With better data comes a better understanding of the overall prevalence of brain injuries resulting from intimate partner violence. This, in turn, could help ensure that federal resources are allocated to the appropriate areas and used as efficiently and effectively as possible to address this public health issue.

Contents

Abbreviations

ACF	Administration for Children and Families
ACL	Administration for Community Living
CDC	Centers for Disease Control and Prevention
HHS	Department of Health and Human Services
DOJ	Department of Justice
HRSA	Health Resources and Services Administration
NIH	National Institutes of Health
NISVS	National Intimate Partner and Sexual Violence Survey
TBI	traumatic brain injury

U.S. GOVERNMENT ACCOUNTABILITY OFFICE
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Congressional Committees

Intimate partner violence—abuse or aggression by a current or former intimate partner—is a significant public health issue experienced by about one in three adults in the United States, according to the Centers for Disease Control and Prevention (CDC).[1] Intimate partner violence, also referred to as domestic violence, includes physical violence, such as slapping, pushing, hitting with a fist or hard object, slamming against something, strangulation, or using a weapon. It can also involve sexual violence, stalking, and psychological aggression. Intimate partner violence can lead to significant chronic health consequences and pose substantial costs to society. The CDC estimated the lifetime economic costs of intimate partner violence to society at $3.6 trillion, which includes costs associated with medical services for related injuries, lost productivity from paid work, and help provided by the criminal justice system.[2] CDC, along with other Department of Health and Human Services (HHS) agencies, works to address this public health issue through, for example, monitoring data on those affected by intimate partner violence and by providing grants to state and local entities to develop and implement prevention programs. Additionally, the Department of Justice (DOJ) provides grant funds to states to support educating individuals on, and improving responses to, intimate partner violence.

[1]An intimate partner refers to a spouse, boyfriend or girlfriend, dating partner, or ongoing sexual partner. See M.J. Breiding et al. *Intimate Partner Violence Surveillance: Uniform Definitions and Recommended Data Elements*, Version 2.0. (Atlanta, Ga: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, 2015).

Centers for Disease Control and Prevention, *National Intimate Partner and Sexual Violence Survey: 2015 Data Brief-Updated Release* (Atlanta, Ga.: November 2018).

[2]The estimated cost of intimate partner violence over a victim's lifetime was $103,767 for women and $23,414 for men. See Centers for Disease Control and Prevention, *Preventing Intimate Partner Violence*, accessed March 16, 2020, https://www.cdc.gov/violenceprevention/intimatepartnerviolence/fastfact.html.

According to researchers, intimate partner violence can result in brain injuries, a major cause of disability in the United States.[3] Brain injuries can result from blows to the head or strangulation; victims of intimate partner violence may incur repeated abuse over long periods of time, with such injuries under-diagnosed and under-treated for many reasons.[4] As one example, individuals who are in abusive relationships may fear to disclose their experiences or seek treatment for their injuries. In addition, health care providers may not recognize that the symptoms experienced by a victim of intimate partner violence could be the result of a brain injury, such as a traumatic brain injury (TBI).

A report accompanying the Department of Defense and Labor, Health and Human Services, and Education Appropriations Act, 2019 and Continuing Appropriations Act, 2019 included a provision for GAO to review the status of research and efforts to promote awareness of the relationship between intimate partner violence and TBI, among other things.[5] Our report

1. describes efforts to provide education, screen for, or treat brain injuries resulting from intimate partner violence; and
2. examines what is known about the prevalence of brain injuries resulting from intimate partner violence, including HHS efforts to determine prevalence.

To describe efforts to provide education, screen for, or treat brain injuries resulting from intimate partner violence, we reviewed HHS and DOJ documentation, as well as documentation we obtained from non-federal stakeholders. Specifically, we reviewed documents and interviewed officials from HHS's Administration for Children and Families (ACF),

[3]Jacquelyn C. Campbell, et al. "The Effects of Intimate Partner Violence and Probable Traumatic Brain Injury on Central Nervous System Symptoms," *Journal of Women's Health,* vol. 27, no. 6 (2018): 761-767; and Gwen Hunnicutt, et al. "Exploring Correlates of Probable Traumatic Brain Injury among Intimate Partner Violence Survivors," *Journal of Aggression, Maltreatment & Trauma,* vol. 28, no. 6 (2019): 677-694.

[4]See Monahan, Kathleen, "Intimate Partner Violence and Traumatic Brain Injury: A Public Health Issue," *Journal of Neurology and Neuromedicine,* 2018.

[5]H.R. Rep. No. 115-952, at 542 (2018). For the purposes of this report, we use the term "brain injury" to refer to traumatic brain injury and anoxic and hypoxic injuries caused by strangulation. We included anoxic and hypoxic injuries because both injuries could be the result of intimate partner violence and have similar symptoms to traumatic brain injury.

Administration for Community Living (ACL), CDC, Health Resources and Services Administration (HRSA), and National Institutes of Health (NIH), as well as officials from DOJ's Office on Violence Against Women and Office of Justice Programs. We also reviewed documents and interviewed officials from a non-generalizable sample of non-federal stakeholder organizations, as well as researchers who work in the area of intimate partner violence, brain injury, or health care services.[6] In total, we collected information from the following stakeholders:

- Three national organizations focused on intimate partner violence—National Center for Victims of Crime, National Resource Center on Domestic Violence, and Training Institute for Strangulation Prevention. We selected these organizations based on discussions with HHS or DOJ officials we interviewed. Additionally, we reviewed these organizations' websites for activities related to brain injuries, and selected a mix of organizations that did and did not receive federal funding.
- Three national organizations focused on brain injuries—Brain Injury Association of America, National Association of State Head Injury Administrators, and Pink Concussions. We selected these organizations by reviewing their websites for activities or statements related to intimate partner violence, domestic violence, or training on brain injuries. Additionally, we selected a mix of organizations that did and did not receive federal funding, and those with and without state chapters.
- Two health care provider associations representing providers likely involved in treating victims of intimate partner violence—American College of Emergency Physicians and International Association of Forensic Nurses. We selected these organizations by reviewing websites for activities or statements related to intimate partner violence, domestic violence, or brain injury.
- Three researchers affiliated with Drexel University, Harvard University, and Johns Hopkins University. We selected these researchers, because they work in the area of intimate partner

[6]We did not include organizations with a focus on children or veterans, or those located outside of the United States. We also selected and contacted one other intimate partner violence organization—the National Center on Domestic Violence, Trauma, & Mental Health—and two other health care provider associations—American College of Obstetricians and Gynecologist and American Psychological Association—but they did not have related information.

violence and brain injuries, and were recommended by HHS or DOJ officials. [7]

In this report, we describe 12 initiatives, which for the purposes of this report are programs or efforts focused on education, screening, or treatment involving individuals with brain injuries resulting from intimate partner violence.[8] We identified these initiatives based on information collected from interviews with HHS and DOJ officials and the stakeholders identified above, as well as a review of the initiatives' websites. Our list represents initiatives identified during the course of our review and may not be exhaustive.[9] Of the 12 initiatives, we conducted site visits to three initiatives in two states—the Connect, Acknowledge, Respond, Evaluate Program in Ohio, as well as the Barrow Concussion and Brain Injury Center's Traumatic Brain Injury Domestic Violence Program and the Maricopa County Collaboration on Concussions in Domestic Violence in Arizona—to interview domestic violence shelter staff, health care providers, and individuals who have brain injuries resulting from intimate partner violence.[10] During these visits, we also spoke with researchers affiliated with Ohio State University and University of Arizona College of Medicine-Phoenix to understand how they worked with the initiatives, as well as other work the universities had related to brain injuries and intimate partner violence.

To examine what is known about the prevalence of brain injuries resulting from intimate partner violence, and HHS efforts to determine prevalence,

[7]We excluded from our selection researchers affiliated with a federal agency, researchers who focused on veterans or addiction, and researchers who were not U.S.-based.

[8]In this report, initiatives refers to efforts related to education, screening, or treatment that involved individuals with brain injuries resulting from intimate partner violence on a regular or scheduled basis and had formal descriptions of their activities. With respect to education, initiatives directed their efforts to individuals or entities outside of their organizations' initiatives, not those organizations that focused primarily on providing internal training to staff members. We excluded programs or efforts that were in the planning stages and those that had not conducted any education, screening, or treatment as of January 31, 2020.

[9]For example, ACL officials told us of another state-based effort that might focus on education, screening, or treatment involving individuals with brain injuries resulting from intimate partner violence, but as of April 21, 2020, did not provide us any details about the effort.

[10]Arizona had two initiatives that looked at education, screening, and one focused on treating brain injuries resulting from intimate partner violence.

we reviewed relevant HHS documents and published literature, and interviewed HHS and stakeholder officials. Specifically, we reviewed documents associated with CDC's National Intimate Partner and Sexual Violence Survey (NISVS) and CDC's Report to Congress on the Epidemiology and Rehabilitation of Traumatic Brain Injury.[11] For the literature review, we searched a variety of databases for relevant articles that focused on brain injuries resulting from intimate partner violence published between January 1, 2009, and August 9, 2019, identifying 57 articles.[12] From these 57 articles, we focused on 28 articles that reported original analysis of information, including data on the prevalence of brain injuries resulting from intimate partner violence. (See app. I for an additional description of our literature review, as well as a bibliography of the articles.) During the interviews, we asked HHS and stakeholder officials about challenges in addressing brain injuries resulting from intimate partner violence. We also asked officials from HHS agencies to describe efforts to determine the prevalence of brain injuries resulting from IPV or related research. Further, we compared their responses about HHS's efforts to CDC's Public Health Approach, which is the agency's approach to addressing public health problems and preventing violence.[13]

We conducted this performance audit from June 2019 to June 2020 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain

[11]NISVS is an ongoing, nationally representative random-digit-dial telephone survey of adult men and women in the United States that measures sexual violence, physical violence, stalking, and intimate partner violence victimization, including sexual, physical, psychological, and stalking forms of intimate partner violence. Noninstitutionalized English- and Spanish-speaking persons aged 18 years and older are surveyed using a dual-frame strategy that includes landline and cell phones. Surveys are conducted in all 50 states and the District of Columbia. The most recent survey data reported by CDC are from 2015.

[12]We selected articles that studied U.S. populations and were not focused exclusively on military or veteran populations. We excluded these military populations because there are different resources available to them compared with the general U.S. population. We excluded articles that examined children or perpetrators of violence, legal system implications, and intimate partner violence-related death. To ensure that we captured articles that focused on brain injuries resulting from strangulation, we conducted a separate search of that topic to identify articles published from January 1, 2009, through mid-October 2019.

[13]See Centers for Disease Control and Prevention, *The Public Health Approach to Violence Prevention*, accessed April 10, 2020, https://www.cdc.gov/violenceprevention/publichealthissue/publichealthapproach.html.

sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

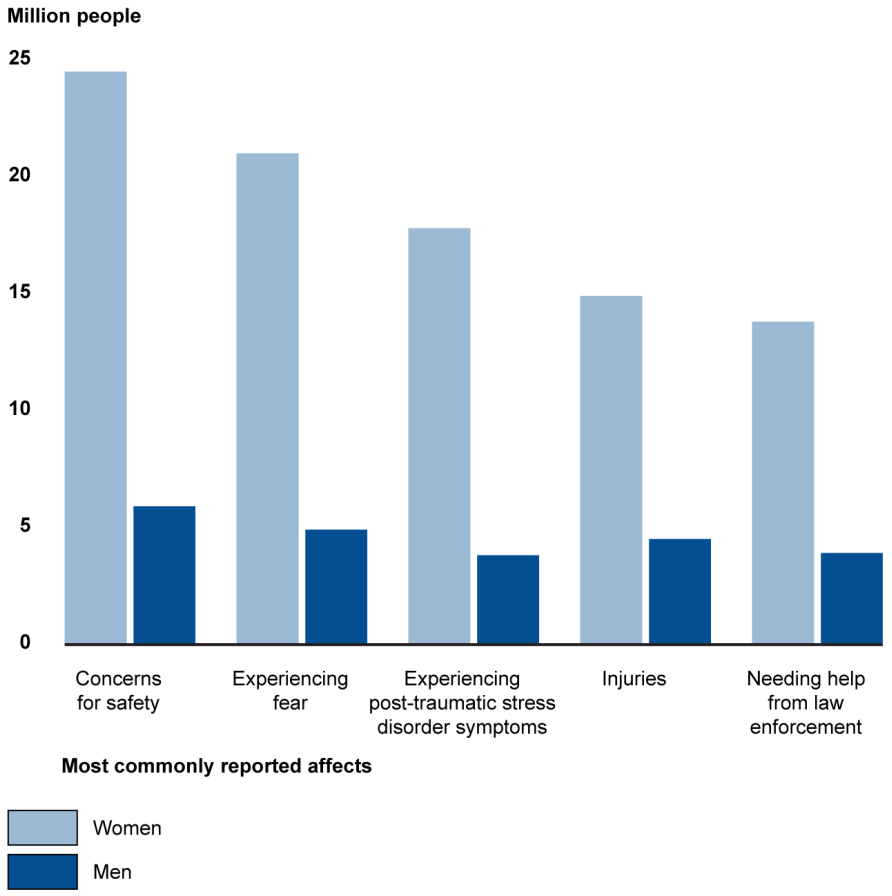
Background

Intimate Partner Violence

Data from CDC's 2015 NISVS indicate that about 43.6 million women (36.4 percent) and 37.3 million men (33.6 percent) in the United States have experienced sexual violence, physical violence, and stalking by an intimate partner.[14] Approximately 21.4 percent of women and 14.9 percent of men in the United States experienced severe physical violence by an intimate partner. About 30 million women (25.1 percent) and 12 million men (10.9 percent) reported experiencing some effect from the violence. (See fig. 1 for the most commonly reported effects of intimate partner violence, as reported by NISVS.)

[14]Centers for Disease Control and Prevention, *National Intimate Partner and Sexual Violence Survey: 2015 Data Brief-Updated Release* (Atlanta, Ga.: November 2018).

Figure 1: Most Common Effects Reported by Victims of Intimate Partner Violence



Source: GAO analysis of Centers for Disease Control and Prevention (CDC) data. | GAO-20-534

Note: Estimates are based on CDC's National Intimate Partner and Sexual Violence Survey (NISVS) as reported in CDC, *The Impact of Intimate Partner Violence: A 2015 NISVS Research in Brief* (Atlanta, Ga: August 2019). NISVS is an ongoing, nationally representative random-digit-dial telephone survey of victims of contact sexual violence, physical violence, and stalking by an intimate partner among adult women and men in the United States. Noninstitutionalized English- and Spanish-speaking persons aged 18 years and older are surveyed using a dual-frame strategy that includes landline and cell phones. Surveys are conducted in all 50 states and the District of Columbia. The most recent survey data reported by CDC are from 2015.

Intimate partner violence can also result in death. Data from U.S. crime reports suggest that 16 percent of homicide victims (about one in six) are

killed by an intimate partner.[15] Strangulation victims, in particular, are at greater risk for being killed, according to the Training Institute on Strangulation Prevention.[16]

Research has shown that certain factors increase the risk that someone may experience intimate partner violence. For example, a review of research on risk factors for women who experience intimate partner violence identified younger age, less education, unemployment, pregnancy, childhood victimization, and mental illness as being associated with higher rates of intimate partner violence.[17] Exposure to intimate partner violence between a child's parents or caregivers is also associated with a greater risk of intimate partner violence in adulthood, according to CDC.[18] Adults with disabilities are also at a higher risk of violence than those without disabilities.[19]

However, research indicates that victims of intimate partner violence may be less likely than others to obtain medical or other services.[20] Even when services are obtained, victims may be less likely than others to identify the source or extent of their injuries out of fear for their safety or reprisal.

[15]Centers for Disease Control and Prevention, *Preventing Intimate Partner Violence*, accessed March 9, 2020, https://www.cdc.gov/violenceprevention/intimatepartnerviolence/fastfact.html.

[16]Training Institute of Strangulation Prevention, *Strangulation in Intimate Partner Violence Fact Sheet*, accessed March 9, 2020, https://www.strangulationtraininginstitute.com/impact-of-strangulation-crimes/important-facts/.

[17]Baylor College of Medicine, *Vulnerability for Abuse*, accessed March 9, 2020, https://www.bcm.edu/research/centers/research-on-women-with-disabilities/topics/violence/vulnerability-for-abuse.

[18]Centers for Disease Control and Prevention, *Preventing Intimate Partner Violence Across the Lifespan: A Technical Package of Programs, Policies, and Practice* (Atlanta, Ga.: 2017).

[19]National Domestic Violence Hotline, *Domestic Violence and People with Disabilities*, accessed March 9, 2020, https://www.thehotline.org/is-this-abuse/domestic-violence-disabilities/; and Matthew J. Breiding and Brian S. Armour, "The association between disability and intimate partner violence in the United States," *Ann Epidemiol*, vol. 25, no. 6 (2015); 455-457.

[20]Gwen Hunnicutt, et al. "Exploring Correlates of Probable Traumatic Brain Injury 677-694; and Allison Crowe, et al. "Help-Seeking Behaviors and Intimate Partner Violence-Related Traumatic Brain Injury," *Violence and Gender,* vol. 6, no. 1 (2019): 64-71.

Brain Injuries

Brain injuries, including those that may result from intimate partner violence, can have several causes, including physical trauma and strangulation; range in severity; and can result in a number of health consequences.

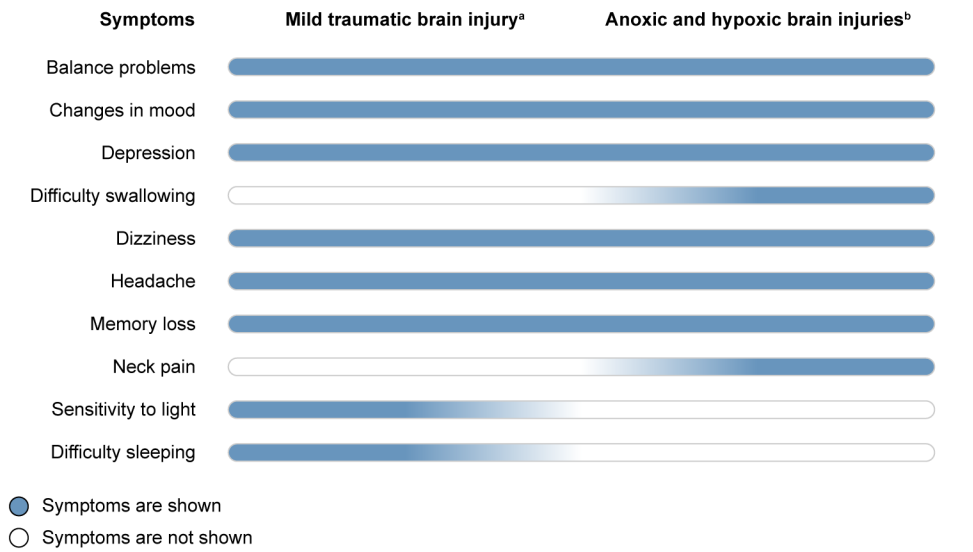
- TBI refers to a brain injury caused by external physical force, such as a blow to the head or shaking of the brain.
- Anoxic (a complete disruption of oxygen to the brain) or hypoxic (a partial disruption of oxygen to the brain) brain injury may result from strangulation or other pressure applied to the neck that restricts blood flow and air passage.

TBIs and anoxic or hypoxic brain injuries may result in irreversible psychological and physical harm.[21] Specifically, people who suffer from TBI and anoxic or hypoxic brain injuries may experience cognitive symptoms, including depression and memory loss, as well as behavioral symptoms, such as changes in mood, or difficulty sleeping, among others.[22] The symptoms individuals experience can also vary. The signs and symptoms of an anoxic or hypoxic brain injury from strangulation can be similar to those of mild TBI, which is often referred to as a concussion. (See fig. 2.)

[21]TBI can be classified as mild, moderate, or severe based on specific criteria, such as the length of time an individual is unconscious following their injury. For example, an individual would meet the criteria for mild TBI—often referred to as concussion—if they suffered a loss of consciousness for 30 minutes or less.

[22]Department of Health and Human Services, Centers for Disease Control and Prevention, Report to Congress, *Traumatic Brain Injury in the United States: Epidemiology and Rehabilitation*. (Atlanta, Ga.: 2015.); and Shepherd Center, *Anoxic and Hypoxic Brain Injury*, accessed March 17, 2020, https://www.shepherd.org/patient-programs/brain-injury/about/types-of-brain-injury/anoxic-hypoxic-brain-injury.

Figure 2: Examples of Symptoms for Mild Traumatic Brain Injury (TBI) and Anoxic and Hypoxic Brain Injury from Strangulation



Source: GAO analysis of documentation from Centers for Disease Control and Prevention and Training Institute for Strangulation Prevention. | GAO-20-534

[a]Mild TBI can be classified based on specific criteria, such as the length of time an individual is unconscious following their injury. For example, an individual would meet the criteria for mild TBI—often referred to as concussion—if they suffered a loss of consciousness for 30 minutes or less.

[b]Anoxic (a complete disruption of oxygen to the brain) or hypoxic (a partial disruption of oxygen to the brain) brain injury may result from strangulation.

According to the Brain Injury Association of America, a severe brain injury can be clearly identified by reviewing an individual's symptoms, but when the brain injury is mild or moderate, providers may need to conduct further assessments or screening to diagnose the brain injury. According to NIH, providers have several options for assessing brain injury that can help determine the severity of the injury. For example, providers may evaluate a person's level of consciousness and the severity of brain injury by attempting to elicit body movements, opening of the eyes, and verbal responses. Providers may also evaluate an individual's speech and language skills or cognitive capabilities.

Role of HHS and DOJ in Addressing Intimate Partner Violence

Both HHS and DOJ support activities for individuals affected by intimate partner violence through several of their agencies. Within HHS, for example, ACF provides federal funding to support emergency shelter and services for the victims of domestic violence and their dependents, as well as the National Domestic Violence Hotline. CDC provides grants to

state and local entities to develop programs aimed at preventing intimate partner violence. Additionally, HRSA—which provides funding to federally qualified health centers—provides funding to develop educational materials for health care workers, in partnership with ACF, to increase the number of individuals screened for intimate partner violence and referred to treatment services, among other things.[23]

DOJ, through its Office of Justice Programs and Office on Violence Against Women, conducts research and provides funding to help states, local governments, and nonprofit organizations' develop programs to reduce violence against women. Many DOJ programs aim to strengthen responses at the local, state, tribal, and federal levels to domestic violence, dating violence, sexual assault, and stalking. Further, the Violence Against Women Reauthorization Act of 2013 amended federal laws to establish criminal penalties for strangulation or suffocation.[24] Additionally, DOJ increased its support of activities focused on training to recognize and prosecute strangulation.

Role of HHS in Addressing TBI

HHS agencies also conduct work related to recognizing and responding to TBI. For example, NIH funds research aimed at developing knowledge about the brain and nervous system in order to reduce the effect of brain-related diseases on individuals. In addition, CDC conducts research on the prevention of TBIs, and ACL provides grants to states to help them to support individuals with brain injuries and to promote the rights of, and provide advocacy support to, those living with TBI.[25]

[23]Federally qualified health centers provide a comprehensive set of primary health care services to individuals regardless of their ability to pay.

[24]Pub. L. No. 113-4, § 906(a)(1), 127 Stat. 54, 124 (2013) (codified at 18 U.S.C. § 113(a)(8)). According to the Training Institute of Strangulation Prevention, most states have made strangulation a felony and many have done so within the past 10 years.

[25]Prior to October 2015, HRSA administered the TBI State Implementation Partnership Program, which is now administered by ACL and called the TBI State Partnership Program.

Efforts to Provide Education, Screen for, or Treat Brain Injuries Resulting from Intimate Partner Violence

We identified 12 initiatives led by non-federal entities that focused on (1) education on brain injuries resulting from intimate partner violence by developing materials or offering training; (2) screening victims of intimate partner violence for potential brain injuries; or (3) treatment involving individuals with brain injuries resulting from intimate partner violence.[26] Our list represents initiatives identified during the course of our review and may not be exhaustive. Some of these initiatives focus on only TBI or strangulation, while others focused on both. See appendix II for additional information on the initiatives.

Education. All 12 initiatives provided education on brain injuries resulting from intimate partner violence. These initiatives developed and distributed educational materials for shelter staff and advocates, health care providers, law enforcement, or those affected by intimate partner violence. The initiatives also provided training to domestic violence shelter staff and others. (See fig. 3 for an excerpt of materials developed by two of the initiatives.) For example:

Training for Domestic Violence Program Staff

Domestic violence program advocates we spoke to told us that before they participated in the Ohio Domestic Violence Network training, they knew their clients were having a hard time remembering things or getting their thoughts across; however, they did not know this could be the result of a brain injury. The training helped advocates identify signs and symptoms in their clients and make others aware of these symptoms. For example, advocates told us they may inform a prosecutor that a client may have a brain injury and may have difficulty remembering or sharing their experiences.

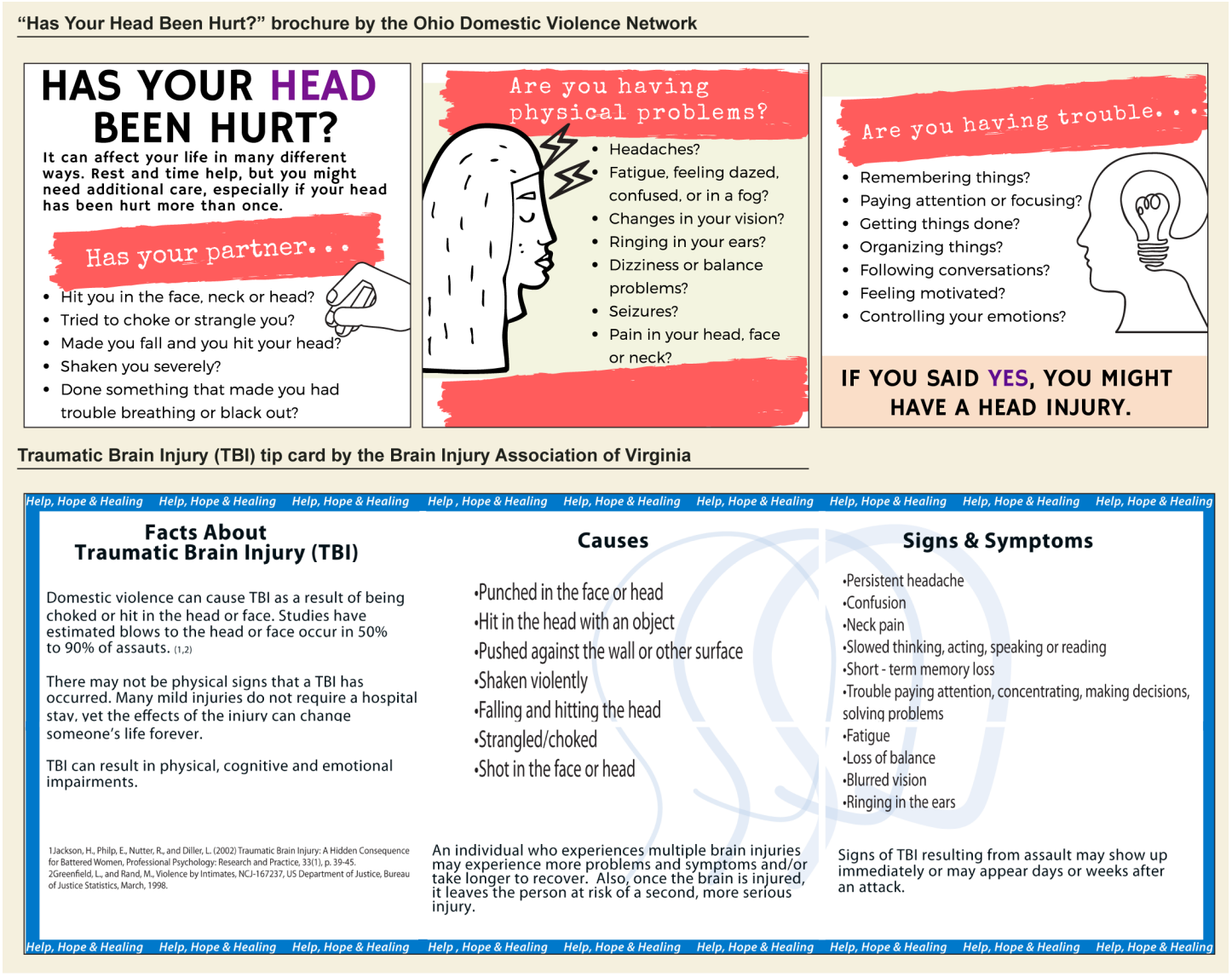
Source: GAO (interview with domestic violence program staff). | GAO-20-534

- The Ohio Domestic Violence Network—as a part of its Connect, Acknowledge, Respond, Evaluate (CARE) initiative—trained staff at five domestic violence programs on brain injuries, and developed educational materials for shelter staff to share with intimate partner violence victims, according to network officials. For example, we spoke to staff at a domestic violence program in Ohio who told us how the education they received from the network helped them identify the signs and symptoms of brain injury in their clients. Staff from another domestic violence program in Ohio told us as a result of CARE training they now suggest strategies to clients to assist them with their memory issues, such as writing appointment information on a whiteboard or in a planner.
- The Swedish Hospital Violence Prevention Program, in Illinois, provided education to physicians, medical residents, and hospital staff to increase health care provider and staff awareness of and ability to respond to brain injuries among victims of intimate partner violence, according to officials with the initiative.
- The Safe Futures initiative, in Connecticut, developed strangulation training materials for emergency medical personnel, law enforcement, prosecutors, and providers, as well as hosted trainings throughout

[26]We identified these initiatives based on information collected from interviews with HHS, DOJ, and other stakeholders and a review of organization websites.

Connecticut on intimate partner violence and brain injuries, according to officials with the initiative.

Figure 3: Excerpt of "Has Your Head Been Hurt," Developed by the Ohio Domestic Violence Network, and the Traumatic Brain Injury Tip Card Developed by the Brain Injury Association of Virginia



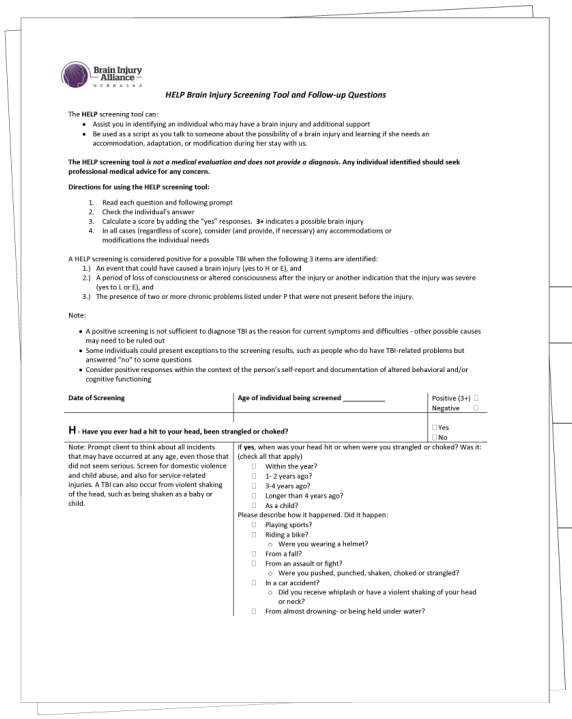
Source: Ohio Domestic Violence Network and the Brain Injury Association of Virginia. | GAO-20-534

Screening. Six of the 12 initiatives used screening tools to identify potential brain injuries among intimate partner violence victims, according to officials. Based on our review of documentation from these initiatives, we found that the screening tools generally had a series of questions about injuries to the head, the loss of consciousness, or behavior changes—symptoms that may indicate a potential brain injury. For example:

- Officials from three initiatives that screened victims for potential brain injuries reported using a version of the HELPS screening tool.[27] (See fig. 4 for an example of a modified version of this screening tool used by one initiative.) Officials from one initiative told us that screening typically occurred at domestic violence shelters where staff and advocates receive training on how to screen intimate partner violence victims.
- Officials from the other three initiatives told us they developed their own screening methods. For example, staff at the Maricopa County Collaboration on Concussions in Domestic Violence in Arizona screen victims using a tool that measures near point of convergence, which refers to an individual's ability to focus both eyes on a target, an approach that can be used to detect a concussion. Police officers from two participating departments in Arizona have used this tool to screen individuals when they respond to a domestic violence call, according to officials with the collaboration.

[27]HELPS is a brief TBI screening tool designed for use by professionals who are not TBI experts. Some organizations, such as the Brain Injury Alliance of Nebraska and the Iowa Department of Public Health, ask about strangulation. Some modified versions of the HELPS tool do not ask about significant sicknesses experienced.

Figure 4: Example of Modified HELPS Brain Injury Screening Tool



Brain Injury Alliance Nebraska

HELP Brain Injury Screening Tool and Follow-up Questions

The **HELP** screening tool can:

- Assist you in identifying an individual who may have a brain injury and additional support
- Be used as a script as you talk to someone about the possibility of a brain injury and learning if she needs an accommodation, adaptation, or modification during her stay with us.

The HELP screening tool *is not a medical evaluation and does not provide a diagnosis*. Any individual identified should seek professional medical advice for any concern.

Directions for using the HELP screening tool:

1. Read each question and following prompt
2. Check the individual's answer
3. Calculate a score by adding the "yes" responses. **3+** indicates a possible brain injury
4. In all cases (regardless of score), consider (and provide, if necessary) any accommodations or modifications the individual needs

A HELP screening is considered positive for a possible TBI when the following 3 items are identified:

1.) An event that could have caused a brain injury (yes to H or E), and
2.) A period of loss of consciousness or altered consciousness after the injury or another indication that the injury was severe (yes to L or E), and
3.) The presence of two or more chronic problems listed under P that were not present before the injury.

Note:

- A positive screening is not sufficient to diagnose TBI as the reason for current symptoms and difficulties - other possible causes may need to be ruled out
- Some individuals could present exceptions to the screening results, such as people who do have TBI-related problems but answered "no" to some questions
- Consider positive responses within the context of the person's self-report and documentation of altered behavioral and/or cognitive functioning

Date of Screening	**Age of individual being screened** _____	Positive (3+) ☐ Negative ☐
H - Have you ever had a hit to your head, been strangled or choked?		☐ Yes ☐ No
Note: Prompt client to think about all incidents that may have occurred at any age, even those that did not seem serious. Screen for domestic violence and child abuse, and also for service-related injuries. A TBI can also occur from violent shaking of the head, such as being shaken as a baby or child.	If **yes**, when was your head hit or when were you strangled or choked? Was it: (check all that apply) ☐ Within the year? ☐ 1- 2 years ago? ☐ 3-4 years ago? ☐ Longer than 4 years ago? ☐ As a child? Please describe how it happened. Did it happen: ☐ Playing sports? ☐ Riding a bike? ○ Were you wearing a helmet? ☐ From a fall? ☐ From an assault or fight? ○ Were you pushed, punched, shaken, choked or strangled? ☐ In a car accident? ○ Did you receive whiplash or have a violent shaking of your head or neck? ☐ From almost drowning- or being held under water?	

HELP Brain Injury Screening Tool and Follow-up Questions

The HELP screening tool can assist people in identifying an individual who may have a brain injury and additional support. Also, can be used as a script as you talk to someone about the possibility of a brain injury and learning if they need accommodation, adaptation, or modification during they stay.

Lists 4 major questions:

Have you ever had a hit to your head, been strangled or choked?

Were you ever seen in the **E** mergency room, hospital, or by a doctor because of a hit to your head or because of strangulation or choking?

Did you ever blackout, **L** ose consciousness or experience a period of being dazed and confused because of a hit to the head or due to choking or strangulation?

Do you experience any of these **P** roblems in your daily life because of a hit your head or due to strangulation or choking?

Source: Brain Injury Alliance of Nebraska. | GAO-20-534

Note: The Brain Injury Alliance of Nebraska created a modified version of the HELPS tool, which includes strangulation, and does not ask individuals about any significant sicknesses they experienced. For each of the four major questions, there are follow up questions, which ask about event occurrence, symptoms, and treatment received, among other things.

Treatment. Two of the 12 initiatives included a treatment component. Officials with the Barrow Concussion and Brain Injury Center in Arizona and the Northside Hospital Duluth Concussion Institute in Georgia told us they provided treatment to victims who were referred by local domestic violence shelters. Providers affiliated with one of these initiatives told us that treatment for brain injuries resulting from intimate partner violence does not differ from treatment for other brain injuries. A provider with one of these initiatives said that treatment could include exercises and movements that decrease dizziness, vertigo, and imbalance; occupational, physical, or speech therapies; or treatment for pain management.

An Intimate Partner Violence Victim's Brain Injury Treatment

Jane Doe was abused by her partner. An advocate at a domestic violence shelter screened Jane for a brain injury and referred her for assessment. She was diagnosed and began treatment for a brain injury. Jane Doe told us that the treatments she received, which included nerve blockers—often used by neurologists to lessen chronic pain—helped to relieve the persistent headaches and debilitating migraines she experienced in the aftermath of her abuse. She told us that as a result of the treatment she received, she feels better able to function.

Source: GAO (interview with an intimate partner violence victim). | GAO-20-534

Officials from the Barrow Concussion and Brain Injury Center told us that individuals with brain injuries resulting from intimate partner violence may face a longer period of recovery compared to others with brain injuries, in part, because of living in unsafe home environments. As a result, special considerations are sometimes needed due to additional barriers faced by domestic violence victims. For example:

- Victims may need safety planning and housing. As a part of the Barrow Concussion and Brain Injury Center's domestic violence initiative, a social worker will help ensure that victims' other needs are met.
- Officials from the Northside Hospital Duluth Concussion Institute noted that transportation could also be a barrier for victims of intimate partner violence. As such, the Georgia Department of Public Health's Injury Prevention Program, which partnered with the Northside Hospital Duluth Concussion Institute, planned to use CDC grant funding to provide domestic violence victims transportation from area shelters to the concussion institute for treatment.[28]
- Officials from the Barrow Concussion and Brain Injury Center also told us about other considerations, such as the need to have a flexible appointment policy to account for the possibility of victims missing or canceling appointments.

Of the 12 initiatives we identified, eight received federal grants from HHS or DOJ, while officials from the other four initiatives told us they were funded with state, local, or private dollars. According to HHS and DOJ officials, the grants did not have specific requirements to address the intersection of brain injuries and intimate partner violence. However, based on our review of documentation, the eight initiatives used the federal funds to focus on the intersection of these two issues. Six of these eight initiatives received funding from HHS. Of them, four were funded by HRSA or ACL grants that focused on TBI-related services and activities, and two were funded by CDC grants focused on injury and violence prevention activities. The other two initiatives were funded by DOJ's Office of Justice Programs through grants that provide funds to support victims of crime.

In addition to the federal funding received by some of the 12 initiatives, we identified other efforts and grants funded by HHS and DOJ. These

[28]The Georgia Coalition Against Domestic Violence is also a partner in this initiative.

efforts made educational materials on intimate partner violence and brain injuries accessible online, made ad-hoc or internal trainings available to external parties, or provided education that touched on the connection between intimate partner violence and brain injury, according to HHS and DOJ officials. For example:

- ACF has funded the National Resource Center on Domestic Violence and Futures Without Violence's National Health Resource Center on Domestic Violence, which provide information related to intimate partner violence and brain injuries via websites.
- ACF, in collaboration with HRSA, funded an effort led by Futures Without Violence, which includes some information on TBI and strangulation in trainings for select state leadership teams working to address intersections of health, intimate partner violence, and human trafficking.[29]
- DOJ's Office on Violence Against Women provided grant funds to support the Training Institute on Strangulation Prevention, which offers training to individuals and outside entities to help them understand, recognize, and appropriately serve strangulation victims, as well as investigate and prosecute strangulation cases.
- DOJ's Office on Violence Against Women has also provided grant funds used by local organizations, such as police departments, to provide ad-hoc or internal training activities on brain injuries and to serve victims with brain injuries, including those caused by strangulation.

[29]As a part of this effort known as Project Catalyst, the selected state leadership teams prepared HRSA-supported health centers and ACF-supported domestic violence programs to form partnerships to address intimate partner violence, human trafficking, and health. For example, the Colorado team developed training materials and online resources that included information to assist advocates and providers in identifying and addressing brain injuries among intimate partner violence victims. Futures Without Violence is a nonprofit public benefit organization that develops strategies to end violence against women and children.

Data on the Overall Prevalence of Brain Injuries Resulting from Intimate Partner Violence Are Limited; Improved Data Could Help Target HHS Public Health Efforts

Based on our review of the literature, as well as interviews with HHS officials and other non-federal stakeholders, we found that data on the overall prevalence of brain injuries resulting from intimate partner violence are limited.

Specifically, available data do not provide an overall estimate of the prevalence of brain injuries resulting from intimate partner violence nationwide. While there are studies that estimate the prevalence of these injuries, these studies are also limited. Specifically, among the 28 articles we reviewed, six included an objective to estimate the prevalence of brain injuries resulting from intimate partner violence, while the remaining 22 articles examined other areas, such as health effects or awareness of brain injuries resulting from intimate partner violence, but did not have an objective to estimate prevalence. The six articles are also specific to a certain subpopulation or certain geographic locations and used different approaches to identify individuals with brain injuries. As a result, the range of reported prevalence rates on victims of intimate partner violence with brain injuries (brain injuries caused by trauma or strangulation) varied greatly (from 11 percent to about 79 percent) and were based on a range of sample sizes, from 95 people to about 1,000 people.

HHS agencies also have some data collection and research efforts related to this issue; however, these efforts are limited as well. For example, CDC and NIH have efforts that may assist in better understanding the connection between brain injuries and intimate partner violence, but CDC's efforts do not account for all causes of brain injuries and NIH has only one study focused on this connection. Further, HHS agencies treat brain injuries and intimate partner violence as separate public health issues and pursue their efforts separately—which limits their ability to better understand the connection between the issues and the overall prevalence of brain injuries that result from domestic violence.

CDC

CDC officials told us that the agency's data on the connection between brain injuries and intimate partner violence are limited, but the agency plans to address some of the limitations. For example, the officials said CDC analyzes health care claims data from emergency department visits to determine the causes of TBI. However, CDC officials told us that these data likely underestimate TBI among victims of intimate partner violence, because many do not seek medical care; for domestic violence victims who seek care, providers are unlikely to designate the individual as a victim of intimate partner violence.

CDC also collects data on intimate partner violence through its NISVS. According to CDC reports, NISVS data are a key source of information on intimate partner violence, but the survey does not collect data on all types of brain injuries related to intimate partner violence. For example, the NISVS estimates the prevalence of victims of intimate partner violence who have been "knocked out after getting hit, slammed against something, or choked."[30] However, published estimates are based on responses to a survey question that asks individuals about being "knocked out," which is a colloquial term commonly used to indicate a loss of consciousness. CDC officials stated that in most known incidents of mild brain injury, people do not lose consciousness. As a result, NISVS data likely understate the number of intimate partner violence victims who may have brain injuries.

In order to better estimate TBIs resulting from intimate partner violence, CDC officials told us they plan to add a survey question to the NISVS to ask respondents about whether they have experienced a concussion—a common term for mild forms of TBI—due to a current or ex-partner.[31] CDC officials told us that they have begun initial testing on several aspects of the survey, including on the additional question with the goal to begin data collection by the end of 2022, plans which are pending approval. Once the NISVS data are collected and analyzed, CDC officials said the data could help them provide a nationally representative prevalence estimate of intimate partner violence victims' who experienced a TBI in their lifetimes.

However, adding the question to the NISVS may not ensure that these data can provide a comprehensive estimate of the prevalence of brain injuries resulting from intimate partner violence. In particular,

[30]Based on the 2010 NISVS, CDC found that 6.2 million women (5.2 percent) and 581,000 men (0.5 percent) had been "knocked out, slammed against something, or choked." Although more recent data are available for women, CDC officials told us that they believe the NISVS 2010 results were more comprehensive than the results from the 2015 survey, because the 2010 results include stable prevalence estimates for both men and women. The 2015 survey only produced stable estimates for women, because of the smaller sample size. Based on the 2015 survey, 5.1 million women had been "knocked out, slammed against something, or choked," and CDC did not report estimates for men.

[31]NISVS defines concussion as a blow to the head that caused the individual to have one or more symptoms such as blurred or double vision, sensitivity to light or noise, headaches, dizziness or balance problems, nausea, being dazed or confused, difficulty remembering, difficulty concentrating, or being knocked out.

The NISVS question will focus on TBIs, and will not account for individuals with brain injuries caused by strangulation.[32] According to educational materials developed by the Training Institute of Strangulation Prevention and used by HRSA in the training of providers and advocates, more than two-thirds of intimate partner violence victims are strangled at least once.[33] CDC officials told us that they are able to measure acts of choking or suffocation through the NISVS, but this measure cannot be used to account for brain injuries resulting from strangulation. Additionally, CDC officials told us that the agency's priority is to focus on TBI specifically rather than accounting for other brain injuries.

- Despite the focus on TBIs, CDC officials told us the NISVS data are not designed to examine whether intimate partner violence is a leading cause of TBI in comparison with other causes, such as sports or motor vehicle crashes.[34] CDC officials said that some research and NISVS data suggest that intimate partner violence is not as large a contributor of TBIs when compared to other contributors.[35] However, they noted that they do not have data on the proportion of TBIs resulting from intimate partner violence. Absent the ability to compare intimate partner violence as a cause of TBI against other contributors through the NISVS or other representative studies, CDC officials will continue to lack an understanding of the full scope of TBIs, their primary causes, and who is affected by them.

[32]Although NISVS captures information on strangulation through a separate question, it does not link strangulation to potential brain injury. For example, NISVS asks respondents whether a partner "tried to hurt you by choking or suffocating you."

[33]E. Taliaferro, et al., "Strangulation in Intimate Partner Violence," *Intimate Partner Violence: A Health-Based Perspective,* Oxford University Press, Inc., (2009) 217-235; and *Intimate Partner Violence and Health: Impacts, Response and Prevention*, accessed on April 7, 2020, https://ipvhealth.org/faqs/.

[34]CDC officials told us that other conditions must be met in order to make this comparison. For example, CDC will need to collect certain data in a separate TBI surveillance system they are in the process of developing.

[35]CDC officials told us that their understanding is based, in part, on NISVS data—which we report above is limited—and on a study that asked individuals about the source of their most recent concussion. However, CDC officials acknowledged that the study did not ask participants about other concussions they sustained, so not all concussions that could have resulted from intimate partner violence were counted and the study did not ask about intimate partners as the source of the concussions. J. Daugherty, et al., "Self-Reported Lifetime Concussion Among Adults: Comparison of 3 Different Survey Questions," *Journal of Head Trauma Rehabilitation*, vol. 35, no. 2 (2020), E136-E143.

NIH

NIH officials identified two agency efforts that could help improve what is known about the connection between brain injuries and intimate partner violence.[36]

- NIH began funding a study in September 2019 that will use advanced brain imaging, blood analyses, and cognitive and psychological testing to study the effects of multiple brain injuries on women subjected to intimate partner violence. The objectives of the study are not to measure prevalence, but to examine the health effects of brain injuries resulting from intimate partner violence. NIH officials told us that this is the first study funded by NIH using brain images to investigate brain injuries resulting from intimate partner violence.
- NIH is also developing blood biomarkers—which are clinical diagnosis tools—for identifying mild TBI.[37] Currently, mild TBI is generally diagnosed by taking an inventory of symptoms, but symptoms can lead to misdiagnoses, including for mental illness or a substance use disorder. NIH officials said they are in the initial stages of developing these biomarkers, which could take the place of screening tools in diagnosing a brain injury. While this effort was not initiated to better understand brain injuries among victims of intimate partner violence, biomarkers have the potential to improve the identification of TBIs, provided they are applied to domestic violence victims.

Two other HHS agencies—ACL and HRSA—also have efforts that address brain injuries or intimate partner violence. However, these agencies' efforts are generally not focused on the connection of the two issues, so they are not likely to result in more complete data on the prevalence of brain injuries resulting from intimate partner violence. Specifically:

[36]In 2017, NIH, in partnership with other federal agencies, hosted a conference on TBI in women. In one of the sessions, participants explored the issue of TBI resulting from intimate partner violence. Following the conference, officials produced a white paper outlining several concerns in understanding the intersection of TBI and intimate partner violence, including the lack of data aimed at understanding the prevalence and effects of intimate partner violence related TBI.

[37]Blood biomarkers are the use of blood from an individual's body to measure their health.

ACL

ACL provides grants to states to establish support services for individuals with brain injuries through its TBI State Partnership Program. As part of these efforts, ACL officials told us that they have begun to gather information to determine how many TBI grant recipients are using the funds to support particular populations, including individuals with TBI resulting from intimate partner violence. As of December 2019, ACL officials told us that two states (Idaho and Iowa) have used the grants to focus on individuals with TBI as a result of intimate partner violence.[38]

HRSA

HRSA has proposed an effort to collect data that may assist in further understanding the health consequences of intimate partner violence. As part of its strategy to address intimate partner violence, HRSA officials recently began requiring federally qualified health centers to capture International Classification of Diseases-10 codes for intimate partner violence on health care claims beginning in 2020. This effort is not aimed at the intersection of intimate partner violence and brain injuries; the purpose of this data collection is to better understand the effect of intimate partner violence on victims' health outcomes. While these data may currently underestimate the number of individuals affected by intimate partner violence, HRSA officials told us that their goal in collecting these data is to underscore the significance of intimate partner violence and help position providers to assist victims. Further, knowing the prevalence of brain injuries resulting from intimate partner violence and using these data could help officials further target education campaigns to providers on the potential injuries associated with intimate partner violence.

Officials from HHS agencies acknowledge that the lack of prevalence data on brain injuries resulting from intimate partner violence is a challenge in addressing the intersection of these issues. However, HHS and its agencies do not have a plan for how they would collect better prevalence data, including a plan that specifies the extent to which HHS agencies should collaborate on data collection efforts. Although HHS agencies have some efforts underway, these efforts are limited or do not examine the connection between the issues. For example, CDC is working to add a question to NISVS to improve what is known about the prevalence of TBIs among victims of intimate partner violence; however, this effort overlooks brain injuries resulting from strangulation—which HRSA reports is often also experienced by these victims—because

[38]States in ACL's grant program are permitted to focus on populations or areas of the state where there may be a high prevalence of TBI.

CDC's priorities are to focus on TBIs specifically. Further, the newly funded NIH study is not intended to estimate the overall prevalence of brain injuries resulting from intimate partner violence.

Having complete data on the prevalence of brain injuries resulting from intimate partner violence could strengthen HHS's efforts to address this public health issue. HHS and its agencies acknowledge that enhancing the health and well-being of Americans is critical to their public health mission and intimate partner violence and TBIs are both prominent injury and violence issues. As part of this mission, CDC uses its Public Health Approach to guide its public health related efforts. The first step of this approach is to define the problem, which includes collecting prevalence data to understand the magnitude of the problem, where the problem exists, and whom it affects. According to CDC, such data are critical to ensuring that resources are focused on the individuals most in need.

Collecting data on the prevalence of brain injuries resulting from intimate partner violence is a critical first step. With better data comes a better understanding of the overall prevalence of brain injuries resulting from intimate partner violence. This would give HHS and its agencies the information necessary to inform their efforts and allocate resources, including grant funding, to address victims of brain injuries resulting from intimate partner violence.

Conclusions

Intimate partner violence affects over 30 percent of women and men in the United States, and research has raised concerns about brain injuries sustained by these domestic violence victims. Officials from HHS agencies acknowledge the lack of overall prevalence data on brain injuries resulting from intimate partner violence and the adverse effect this lack of data has on understanding the intersection of these two issues. While HHS agencies have some efforts underway to address brain injuries and intimate partner violence, they are limited and address these issues separately. Therefore, HHS and its agencies have missed an opportunity to improve their public health efforts to address this issue, particularly the prevalence of the problem, where the problem exists, and whom it affects. By working together, HHS and its agencies can identify ways that each agency's efforts could result in better prevalence data and a better overall understanding of brain injuries resulting from intimate partner violence. Improved data, in turn, could also help ensure that federal resources are allocated to the appropriate areas and used as efficiently and effectively as possible to address this public health issue.

Recommendation

We are making the following recommendation to HHS:

The Secretary of HHS should develop and implement a plan to improve data collected on the prevalence of brain injuries resulting from intimate partner violence and use these data to inform HHS's allocation of resources to address the issue. (Recommendation 1)

Agency Comment

We provided a draft of this report to HHS and DOJ for review and comment. In its written comments (reproduced in app. III), HHS concurred with our recommendation and noted that it is coordinating a plan amongst its relevant agencies to augment data collection on the prevalence of brain injuries resulting from intimate partner violence. HHS noted that these data will continue to inform the needs of this vulnerable population. HHS and DOJ also provided technical comments, which we incorporated as appropriate.

We are sending copies of this report to the appropriate congressional committees, Secretary of Health and Human Services, Attorney General, and other interested parties. In addition, the report is available at no charge on the GAO website at http://www.gao.gov.

If you or your staff members have any questions about this report, please contact me at (202) 512-7114 or yocomc@gao.gov. Contact points for our Office of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix IV.

Carolyn L. Yocom
Director, Health Care

Congressional Committees

The Honorable Lamar Alexander
Chairman
The Honorable Patty Murray
Ranking Member
Committee on Health, Education, Labor, and Pensions
United States Senate

The Honorable Lindsey Graham
Chairman
The Honorable Dianne Feinstein
Ranking Member
Committee on the Judiciary
United States Senate

The Honorable Roy Blunt
Chairman
The Honorable Patty Murray
Ranking Member
Subcommittee on Labor, Health and Human Services, Education, and Related Agencies Committee on Appropriations
United States Senate

The Honorable Frank Pallone Jr.
Chairman
The Honorable Greg Walden
Republican Leader
Committee on Energy and Commerce
House of Representatives

The Honorable Richard E. Neal
Chairman
The Honorable Kevin Brady
Republican Leader
Committee on Ways and Means
House of Representatives

The Honorable Rosa DeLauro
Chairwoman
The Honorable Tom Cole
Ranking Member
Subcommittee on Labor, Health and Human Services, Education, and Related Agencies Committee on Appropriations
House of Representatives

Appendix I: Description of Literature Review and Bibliography

We identified articles for our literature review through a search of bibliographic databases, including Harvard Library Think Tank Search, MEDLINE, and Scopus, using terms such as “intimate partner violence,” “domestic violence,” “traumatic brain injury,” and “strangulation.”[1] We determined there were 57 relevant articles from 2009 through August 2019 discussing brain injuries resulting from intimate partner violence.[2] We reviewed the 57 articles to examine brain injuries resulting from intimate partner violence, including background information on the concerns of brain injuries resulting from intimate partner violence and challenges that researchers may have identified in conducting this work.

Of the 57 articles, we identified 28 that had conducted their own data analyses.[3] We analyzed these 28 articles to examine data on prevalence rates, as well as research on health effects, treatment, and screening tools for identifying brain injuries resulting from intimate partner violence. The following articles are based on an original analysis of data.

Brown, Joshua, Dessie Clark, and Apryl E. Pooley. “Exploring the Use of Neurofeedback Therapy in Mitigating Symptoms of Traumatic Brain Injury

[1]Other databases we searched were ABI/INFORM® Professional Advanced, AgeLine, APA PsycINFO, ArticleFirst, BIOSIS Previews®, British Nursing Index, CINHAL, Cochrane Review Library, ECO (Electronic Collections Online), Embase®, EMCare®, ERIC, Global Health, HSELINE: Health and Safety, Index to Legal Periodicals and Books (H.W. Wilson), International Pharmaceutical Abstracts, King’s Fund, Lancet Titles, MEDLINE, NTIS: National Technical Information Service, PAIS International, PapersFirst, PolicyFile Index, ProQuest Criminology Collection, ProQuest Dialog Health Research Full Text Professional, ProQuest Dissertations & Theses Global, ProQuest Education Database, ProQuest Global Newsstream, ProQuest Health & Medical Collection, ProQuest Research Library, ProQuest SciTech Premium Collection, ProQuest Sociology Collection, PTSDpubs, Risk Management Reference Center, SciSearch®: a Cited Reference Science Database, Social SciSearch®, Web of Science, and WorldCat. In total our search resulted in 513 articles, which we reviewed.

[2]We also conducted our search for articles about brain injury and strangulation in October 2019, the point in time at which we added strangulation to our study. All articles selected were not focused exclusively on military or veteran populations, as there are different resources available to populations within the military. We also selected articles for our review that did not study children or perpetrators of violence, those with legal system implications, or those that did not examine intimate partner violence related death.

[3]We identified another 29 articles in our literature review, these articles were reviews of the literature or commentaries. Literature reviews and commentaries generally highlighted concerns about data, the need for additional research, and the lack of awareness about the connection between brain injuries and intimate partner violence. However, these 29 articles had not conducted their own data analyses or were not published in a peer-reviewed journal.

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Appendix II: Nonfederal Initiatives Focused on Intimate Partner Violence and Brain Injury

The following table provides a brief overview of each of the 12 initiatives we identified based on information provided by the Department of Health and Human Services, the Department of Justice, and other stakeholders. These initiatives engage in various efforts to address intimate partner violence and brain injuries, including traumatic brain injury and anoxic injuries resulting from strangulation. Our list includes those efforts identified during the course of our review and may not be exhaustive. The descriptions of initiatives are based on our review of documentation and information obtained from interviews with officials.

Table 1: Reported Activities of 12 Nonfederal Initiatives that Take Steps to Address Intimate Partner Violence and Brain Injury

Initiative and location	General description	Activities involved		
		Education	Screening	Treatment
Traumatic Brain Injury Program* Alabama (statewide)	**Organization(s) leading efforts:** The Alabama Department of Rehabilitative Services, in partnership with the Alabama Coalition Against Domestic Violence, and the Alabama Head Injury Foundation **Federal funding:** Health Resources and Services Administration's (HRSA) Traumatic Brain Injury (TBI) State Implementation Partnership Grant Program[a] • Developed: (1) educational materials for use by domestic violence shelter staff, such as a tool for screening,[b] and referring individuals with potential brain injuries and educational brochures for victims; and (2) a training manual on brain injuries in intimate partner violence victims used in trainings for shelter staff, health care providers, and law enforcement.	✓	✕	✕
Domestic Violence Traumatic Brain Injury Program Arizona	**Organization(s) leading efforts**: Barrow Concussion and Brain Injury Center **Federal funding:** None • Provided education to victims, health care providers, and others. For example, occupational therapists and speech therapists held classes—known as Brains Club—at partner shelters to help residents improve their memory, concentration, and other skills. • Six participating shelters used the HELPS[c] tool to screen victims of intimate partner violence for brain injury, and referred victims to the Barrow Concussion and Brain Injury Center for treatment. • Patients were evaluated and treated by a neurologist who specializes in brain injury.	✓	✓	✓

Initiative and location	General description	Activities involved		
		Education	Screening	Treatment
Maricopa County Collaboration on Concussions in Domestic Violence Arizona	**Organization(s) leading efforts**: The Sojourner Center, a domestic violence shelter, in partnership with the CACTIS Foundation, Maricopa County Attorney's Office Family Violence Bureau, Mesa and Tempe police departments, HonorHealth's Scottsdale Family Advocacy Center, the University of Arizona College of Medicine, and the Barrow Neurological Institute at Phoenix Children's Hospital **Federal funding:** None • Provided education and training to police officers about the signs and symptoms of traumatic brain injuries. • Screening: police officers from two participating departments began screening individuals for traumatic brain injury when they respond to a domestic violence call using a tool that measures near point of convergence—which refers to an individual's ability to focus both eyes on a target, and can be used to detect a concussion. Individuals are then referred for forensic examinations, advocacy support services, or to the Sojourner Center.	✓	✓	✕
Safe Futures initiative Connecticut	**Organization(s) leading efforts:** Safe Futures **Federal funding:** None • Developed strangulation training materials and hosted trainings throughout Connecticut on intimate partner violence and brain injuries for first responders, law enforcement, prosecutors, and health care providers.	✓	✕	✕
Northside Hospital Duluth Concussion Institute Initiative Georgia	**Organization(s) leading efforts:** The Georgia Coalition Against Domestic Violence, Northside Hospital Duluth Concussion Institute, and the Georgia Department of Public Health Injury Prevention Program **Federal funding:** Centers for Disease Control and Prevention's (CDC) Core State Violence and Injury Prevention Program[d] • Provided education and trainings to advocates and the community statewide on the signs and symptoms of concussions, appropriate response, and available community resources. • Developed a concussion screening tool[b] for individuals seeking support through either shelters or legal advocates, and trained shelter staff and advocates on how to implement the screening tool and refer victims of intimate partner violence to services. Two participating shelters referred those suspected of a brain injury to the Northside Hospital Concussion Institute for treatment. • Conducted a concussion test as a part of their initial evaluation to determine the extent of the individual's brain injury and implemented a specific treatment plan to facilitate recovery.	✓	✓	✓

Initiative and location	General description	Activities involved		
		Education	Screening	Treatment
Swedish Hospital Violence Prevention Program Illinois	**Organization(s) leading efforts:** Swedish Hospital **Federal funding:** Department of Justice (DOJ) Office for Victims of Crime Advancing Hospital-Based Victim Services[e] • Provided education to health care providers and staff to increase awareness of and ability to respond to TBI and strangulation among intimate partner violence victims in the Chicago area. Also, Swedish Hospital conducted a retrospective chart review of emergency room patients who presented with head injury or strangulation in connection with intimate partner violence or sexual assault, with plans to assess practices with regard to screening, testing, imaging, documentation, and outpatient follow-up care.	✓	✕	✕
Iowa Department of Public Health Initiative* Iowa	**Organization(s) leading efforts:** Iowa Department of Public Health and the Iowa Coalition Against Domestic Violence **Federal funding:** HRSA's TBI State Implementation Partnership Grant Program[a] • Provided training to domestic violence shelter staff across the state on how to conduct TBI screenings using the HELPS[c] screening tool. • Collaborated with the Iowa Department of Corrections to develop and pilot screening using the HELPS screening tool, and provide resources and referrals to individuals who screened positive for TBI.	✓	✓	✕
Brain Injury Alliance of Nebraska Initiative Nebraska	**Organization(s) leading efforts**: Brain Injury Alliance of Nebraska and the Nebraska Department of Health and Human Services **Federal funding:** CDC's Core State Violence and Injury Prevention Program[d] • Conducted 20 trainings with participants including shelter staff working with victims of intimate partner violence, law enforcement, and health care providers, among others. • Participating shelters screened victims using a modified HELPS[c] screening tool, and provided victims the option of a referral to a neuropsychologist for further assessment.	✓	✓	✕
New York State Department of Health Initiative* New York	**Organization(s) leading efforts**: The New York State Department of Health, the Brain Injury Association of New York State, and the New York State Coalition Against Domestic Violence **Federal funding:** HRSA's TBI State Implementation Partnership Grant Program[a] • Provided regional trainings and webinars to raise general awareness of the prevalence of brain injuries among victims of intimate partner violence.	✓	✕	✕

Initiative and location	General description	Activities involved		
		Education	Screening	Treatment
Connect, Acknowledge, Respond, Evaluate (CARE) Program Ohio	**Organization(s) leading efforts:** The Ohio Domestic Violence Network **Federal funding:** DOJ's Office of Justice Programs' Office for Victims of Crime Vision 21[e] • Developed and disseminated best practices for shelter staff and others working with people accessing domestic violence programs who may have a brain injury or may be experiencing mental health challenges, and trained and provided technical assistance for those interacting with victims of intimate partner violence. • Five participating domestic violence programs, including shelters, screened individuals affected by intimate partner violence for potential brain injuries using tools developed by the Ohio Domestic Violence Network.[b]	✓	✓	✕
Brain Injury Association of Virginia Initiative Virginia	**Organization(s) leading efforts:** Brain Injury Association of Virginia and the Virginia Department of Aging and Rehabilitative Services **Federal funding:** Administration for Community Living's (ACL) TBI State Partnership Program[a] • Developed educational materials, such as presentations, tip cards, and fact sheets, on intimate partner violence and brain injuries. Trained over 40 domestic violence agencies and shelter providers, and over 200 staff from local social service departments and local health departments. Also provided education to police officers about the potential for TBI if they are called to a domestic incident, and how that may affect the victim's ability to provide a statement. • Future efforts: The Brain Injury Association of Virginia is planning a 2-year project to document the prevalence of brain injuries resulting from intimate partner violence in Virginia and to demonstrate the effectiveness of community-based intervention protocols.	✓	✕	✕
The I-CAN! Accessibility Project Virginia	**Organization(s) leading efforts:** The Partnership for People with Disabilities and the Virginia Commonwealth University School of Social Work **Federal funding:** None. • Worked with the Brain Injury Association of Virginia to promote awareness about abuse and resources available for individuals with a brain injury resulting from intimate partner violence and to provide training for brain injury support providers about intimate partner violence.	✓	✕	✕

Legend: ✓=activity has occurred; ✕=activity has not occurred

Source: GAO analysis of documentation obtained from the above initiatives. | GAO-20-534

Notes: Initiatives denoted with (*) were not active as of January 2020.

[a]The TBI State Implementation Partnership Grant Program provides funding to help states increase access to services and support for individuals with a TBI by providing information and referral services and screening for individuals with TBI, among other things. HRSA, within the Department of Health and Human Services (HHS), no longer administers this program. In 2014, HHS moved oversight of this program from HRSA to ACL, beginning October 1, 2015. The program is now called the Traumatic Brain Injury State Partnership Program.

[b]Screening tools are used to identify potential brain injuries among intimate partner violence victims, according to officials. We found that the screening tools generally had a series of questions about injuries to the head, the loss of consciousness, or behavior changes—symptoms that may indicate a potential brain injury.

[c]HELPS is a brief TBI screening tool designed for use by professionals who are not TBI experts.

[d]CDC's Core State Violence and Injury Prevention Program provides 23 states funding to implement, evaluate, and disseminate strategies that address injury and violence issues within four areas: child abuse and neglect, traumatic brain injury, motor vehicle crash injury and death, and intimate partner and sexual violence.

[e]DOJ's Office of Justice Programs' Office for Victims of Crime provides funding through the Advancing Hospital-Based Victim Services demonstration initiative, which is awarded to organizations with the aim of improving partnerships between the victim services field and hospitals and other medical facilities to increase support for crime victims. The Office of Justice Programs' Office for Victims of Crime also provides funding through Vision 21, which is awarded to organizations that serve victims of crime at the national level, among others.

Appendix III: Comments from the Department of Health and Human Services

DEPARTMENT OF HEALTH & HUMAN SERVICES
OFFICE OF THE SECRETARY

Assistant Secretary for Legislation
Washington, DC 20201

June 1, 2020

Carolyn Yocum
Director, Health Care
U.S. Government Accountability Office
441 G Street NW
Washington, DC 20548

Dear Ms. Yocum:

Attached are comments on the U.S. Government Accountability Office's (GAO) report entitled, *"DOMESTIC VIOLENCE: Improved Data Needed to Identify the Prevalence of Brain Injuries among Victims"* (Job Code 103599/GAO-20-534).

The Department appreciates the opportunity to review this report prior to publication.

Sincerely,

Sarah C. Arbes -S
Digitally signed by Sarah C. Arbes -S
Date: 2020.06.01 21:51:21 -04'00'

Sarah C. Arbes
Assistant Secretary for Legislation

Attachment

GENERAL COMMENTS FROM THE DEPARTMENT OF HEALTH & HUMAN SERVICES ON THE GOVERNMENT ACCOUNTABILITY OFFICE'S DRAFT) REPORT ENTITLED — DOMESTIC VIOLENCE: IMPROVED DATA NEEDED TO IDENTIFY THE PREVALENCE OF BRAIN INJURIES AMONG VICTIMS (GAO-20-534)

The U.S. Department of Health & Human Services (HHS) appreciates the opportunity from the Government Accountability Office (GAO) to review and comment on this draft report.

Recommendation 1
The Secretary of HHS should develop and implement a plan to improve data collected on the prevalence of brain injuries resulting from intimate partner violence and use these data to inform HHS's allocation of resources to address the issue.

HHS Response:
HHS concurs with GAO's recommendation.
HHS is coordinating amongst relevant components a plan to augment data collection on the prevalence of brain injuries resulting from intimate partner violence (IPV). Data collected from this collaboration will continue to inform the needs of this most vulnerable population.

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Appendix IV: Staff Acknowledgements and GAO Contact

GAO Contact

Carolyn L. Yocom at (202) 512-7114 or yocomc@gao.gov

Staff Acknowledgments

In addition to the contact named above, Shannon Slawter Legeer (Assistant Director), Danielle Bernstein (Analyst-in-Charge), and Ashley Dixon made key contributions to this report. Also contributing were Leia Dickerson, Kaitlin Farquharson, Drew Long, and Ethiene Salgado-Rodriguez.