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# The Importance of Revising Florida's Motorcycle Helmet Laws to Prevent Traumatic Brain Injury – A Commentary

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Riding a motorcycle on the open road, with the wind in one's hair may seem like the ultimate symbol of freedom and liberty, but in reality foregoing a helmet may result in disability, dependence, and even death. Traumatic brain injury (TBI) as a result of motor vehicle accidents, particularly motorcycle accidents, is a widely prevalent issue. According to the CDC, in 2013 motor vehicle crashes were the third leading cause of TBI related hospitalizations, visits, and deaths in the US amongst all age groups. They were also the leading cause of death amongst individuals between 5 and 24 years of age and the leading cause of hospitalizations for adolescents and individuals between 15 and 44 years of age ("TBI," 2017).

Not only are TBIs due to motor vehicle crashes a widely prevalent issue on a national level, they are very common in the State of Florida as well. In the year 2014 alone, 176,107 people sustained a TBI in Florida. Of these, 21,081 were hospitalized; approximately 1 in 3 of these hospitalizations (27%) were due to motor vehicle collisions. 3,082 died and approximately 1 in 5 (18%) of these were due to motor vehicle collisions ("Special Emphasis Report: Traumatic Brain Injury," 2014). This number is greater than the 2,634 deaths due to drug overdose, another widely prevalent cause of deaths, during the same year ("Drug Overdose Mortality by State," 2019). According to the most recent data from the Florida Department of Highway Safety and Motor Vehicles, in 2015 there were 10,201 motorcycle crashes, a 3.52% increase from the previous year, resulting in 546 motorcyclist deaths and 38 motorcycle passenger deaths, in addition to 8,231 motorcyclist injuries and 814 motorcycle passenger injuries ("Traffic Crash Facts," 2016). While data on the number of traumatic brain injuries resulting specifically from motorcycle accidents is not readily available, local experts in Miami-Dade County

estimate that 40-50% of TBIs they treat are the result of motorcycle accidents.

Although TBI is often thought of as an acute problem, it can have life-long ramifications for the patient's health and can lead to disability. In addition to the immediate costs of treating TBI, which according to local experts can cost hundreds of dollars, once sustained, a TBI can lead to lifelong health issues. Many of these individuals end up disabled, and my never work again. The rehabilitation process, although sometimes lasting for several weeks, can sometimes last more than a year or several years. TBI can lead to short and long term changes in memory, reasoning, sight, balance, communication, as well as depression, anxiety, personality changes, aggression, acting out, and socially inappropriate behavior. TBI patients also have an increased risk of epilepsy, Parkinson's Disease, Alzheimer's Disease, and other brain disorders ("Potential Effects | Concussion | Traumatic Brain Injury | CDC Injury Center," n.d.). Local experts consulted believe that certain ethnic groups, such as African Americans and Hispanic Latinos, are less likely to get back to work after a TBI, probably because they lack the resources for recuperating from the injury through therapies and equipment, some of which may not be covered even for those who are insured.

A revision to the Florida motorcycle helmet law can potentially reduce the incidence of TBIs due to motorcycle crashes. On July 1<sup>st</sup>, 2000 a new helmet law in the State of Florida was passed that required motorcycle riders younger than 21 to wear helmets. Adult motorcycle and moped riders were exempted under this new law provided they had medical insurance of \$10,000. The latter dollar amount is barely enough to cover the true costs of TBIs. Prior to 2000, Florida had a helmet law that required all riders to wear safety helmets (Muller, 2004). While concerns about helmets posing a risk for cervical spine injuries

are sometimes raised, a recent study demonstrated that there was no statistical significance in cervical spine injury when comparing helmeted versus non-helmeted vehicle riders (Hooten & Murad, 2014). In general, studies have demonstrated that in states with universal helmet laws that require all motorcyclists to wear helmets, there has been a lower incidence of TBIs, severe TBIs, and death from TBIs as compared to states that have a helmet law that does not cover motorcyclists of all ages (Olsen et al., 2016; Kraus & Peek, 1995; Coben, Steiner, & Miller, 2007; Weiss, Agimi, & Steiner, 2010; Croce, Zarzaur, Magnotti, & Fabian, 2009). The type and fit of the motorcycle helmet matters as well. A case-control study done by Yu et al in 2011 demonstrated that motorcyclists with half coverage helmets were more than twice likely to have head injuries and brain injuries compared to those wearing full face helmets. They also demonstrated that motorcyclists with loosely fastened helmets were more than twice as likely to have brain injuries and increased risk of head injury compared to motorcyclists with firmly fastened helmets (Yu, Chen, Chiu, & Lin, 2011).

Ultimately, traumatic brain injury as a result of motorcycle accidents can be an event with significant health-related and economic consequences for the patient and society. We need to do a better job at protecting the public from this very real and costly, but preventable, risk of injury. We need to do better in collecting data on motorcycle-related TBIs. But most importantly, revisions to Florida legislation to implement a universal helmet law and helmets with a safe design can help prevent these issues.

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