Preventing Head Trauma and Saving Lives:
Universal Helmet Law in Texas

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According to Berkowitz (2012), health policy is made within government structures and either directs or influences the "actions, behaviors, and decisions pertaining to health and its determinants" (p. 50). With TBIs simple understanding of health policy, the charge and responsibility of government officials to create policies can have substantial impact on public health (Friis, & Sellers, 2014). Friis & Sellers (2014) note examples of laws and policies that can impact public health which include both mandatory seat belt use in motor vehicles, and helmet protection for motorcycle riders.

Therefore, it is important to recognize during the policy making process for motorcycle helmets, a public health problem is being addressed.

Context

Problem Identification

The state of Texas repealed their universal helmet law in 1997 and replaced it with a partial helmet law that required a helmet be worn only for those less than 21 years of age or did not have a minimum of $10,000 in medical benefits for injuries incurred while operating the motorcycle. In the following year after the repeal of the universal helmet law, helmet use decreased from 77 percent to 63 percent. At the same time, fatalities increased by 31% and the severity of traumatic brain injuries worsened for motorcyclists, resulting in the average treatment cost per crash increasing from $4,585 to $22,531 (Derrick & Faucher, 2009). According to Ackerman in 2010, helmet use in Texas continued to decline to approximately 36 percent by 1998 and thereafter.

In a 2008-2010, an analysis of the National Highway Traffic Safety Administration (NHTSA) data from the Fatality Analysis Reporting System (FARS) found on average, 12% of

the motorcyclists fatally injured were not wearing helmets in states with universal helmet laws compared to 64% in partial helmet law states (Centers for Disease Control and Prevention (CDC), 2012). The economic costs in 2010 saved from helmet use in the states with a universal helmet law averaged $725 per registered motorcycle as compared to $198 in states without TBIs law (CDC, 2012).

Since morbidity and mortality as well as health care costs have risen since the change in the helmet law, it is important to examine the options to reverse this trend.

Background

Over the last four decades, state legislatures have debated helmet laws for motorcyclists. According to the Governors Highway Safety Association (2013), in the mid-1970's, 47 states had universal helmet laws, which required all motorcyclists to wear a helmet; whereby in 2013, only 19 states had maintained their universal laws, 28 states implemented laws only requiring helmets for specific riders and three states have no helmet laws. In 2009, Senate Bill 1967 was signed into law in Texas, removing the minimum of $10,000 in health insurance for injuries incurred in a motorcycle accident (Texas Department of Public Safety, 2000-2011). The current partial helmet law in Texas requires a helmet for those less than age 21 or motorcyclists that have not completed a safety course or have no medical insurance (Governors Highway Safety Association, 2013). Additionally, a motorcyclist cannot be stopped for the sole purpose of determining whether they have completed a training course or have insurance (Texas Motorcycle Helmet Law, 2002-2014).

Social factors. Disability from severe head injuries can be viewed as a social issue resulting in loss of ability to work and/or live independently. Coben, Steiner, & Miller (2006) did a cross-sectional analyses of hospital discharge data from 33 states and noted states lacking

universal helmet laws are 41% more likely to sustain the most severe forms of intracranial injury, and a large proportion required being transferred to long-term care in rehabilitation facilities and/or nursing homes after their long acute care hospitalization. Parkland Health and Hospital System, a Level 1 Trauma Center in Dallas, Texas compared 1,525 helmeted patients to 1,634 patients without helmets in regard to severe head injury and found 21 percent were helmeted compared to 30 percent not wearing helmets. (Parkland Health & Hospital, 2014). Many years of productive life may be lost in a case of a motorcyclist sustaining a severe head injury.

Economic factors. The aforementioned social issues often translate into an economic burden for society because research has found that hospitalized motorcyclists are also frequently uninsured (United States General Accounting Office, 1991; Coben, et al., 2006; Croce, Zarzaur, Magnotti, & Fabian, 2009; Parkland Health and Hospital System).

In the data analysis for the period of January 1, 1996 to December 31, 2012, Parkland Health and Hospital System reported total hospital charges for 1,526 helmeted patients were $49,463,869.28 compared to $70,347,341.98 for the 1,634 patients without helmets. Some of the increased costs could be attributed to longer stays in the Intensive Care Unit (ICU). Parkland Memorial Hospital also contributes data, as do all Level I Trauma Centers in Texas, to the National Trauma Data Bank. Croce, et al. (2009) analyzed 76,944 motorcycle collisions in TBIs data bank from 2002-2007 and found helmet use could save approximately $32.5 million by reducing ICU stay. The most recent economic data for motorcycle crashes in 2008- 2010 was approximately a $3 billion savings as a result of helmet use in the United States, with another $1.4 billion saved if all motorcyclists had worn helmets (CDC, 2012).

Ethical factors. The primary ethical argument by motorcyclists and other advocacy groups is the infringement of individual rights and freedom, whereas advocates for mandatory

helmet laws believe it is a public health and safety issue and policy decisions should be based on protecting citizens from needless morbidity, suffering and mortality (Jones & Bayer, 2007; Cherry, 2010).

The American Motorcycle Association (AMA) believe adults are capable of making their own safety decisions and society's role is only to provide education and experience necessary to aid them in making these decision for themselves (AMA, n.d.). Proponents against helmet laws view any legislation on helmet use as paternalistic protective legislation aimed at protecting people from self-imposed injuries and avoidable harm and subsequently violating their right to freedom of choice (Cherry, 2010). Under the ethical framework of autonomy, the AMA also "opposes provisions conditioning adult helmet use choice on economic criteria such as, but not limited to, additional medical insurance coverage" (AMA, n.d.).

On the other hand, public health officials and heath care professionals, in particular, subscribe to the idea that motorcycle helmet safety laws are designed to protect lives and reduce the impact of economic losses due to injury or death (Cherry, 2010). They believe the "socioeconomic costs related to medical expenses, insurance costs, lost earnings and wages, unemployment compensation, and disability might constitute harm to society as a whole, extending beyond the individual who chose not to wear a helmet during a motorcycle crash" (Cherry, 2010).

Political factors. According to Cherry in 2010 the four political factors in play for policy setting are: 1) the players or stakeholders; 2) the power that each player has in the political arena; 3) the position that is expressed by each player as well as the proportion of resources and intensity of that position and; 4) the public perception of both the problem and the proposed solution.

Motorcyclists rally their members to take powerful political action. An Alliance of Bikers Aimed Toward Education (ABATE) is a strong political force both regionally and nationally that, in part, is “an alliance dedicated to the protection of the individual rights of motorcyclists through political change and awareness (Texas Abate News, 2014, Jan/Feb). ABATE partners with national motorcycle organizations such as the American Motorcycle Association and the Motorcycle Riders Foundation (Cherry, 2010). A review of the latest Texas ABATE news (2014, Jan/Feb) reveals both a Texas and national legislative update that mobilizes their members into political action. It was noted in the ABATE news that a U.S. Representative and a lifelong motorcyclist had written the CDC stating that mandatory helmet laws would discourage motorcycle use, decrease pleasure riding and ignores the positive economic impact the motorcycle industry makes on tourism, dealer-sales and tax revenues (Texas Abate News, 2014, Jan/Feb). The political challenge for the proponents of helmet laws is to justify legislation to protect motorcyclists from self-imposed injuries and avoidable harm, and ultimately overcome the American political culture that values individual liberty (Jones et al., 2007; Cherry, 2010).

Stakeholders

Stakeholders in Texas health policy development in regard to motorcycle helmets include legislators, motorcyclists, motorcycle advocacy groups, health care professionals, public health officials and the Texas Department of Insurance.

Issue Statement

What should the Texas helmet law for motorcyclists be in order to reduce morbidity and mortality in motorcycle crashes, and lower the health care costs and associated societal burdens of these crash victims?

Policy Goals and Options

Policy objectives. Safety for all Americans is our primary objective. Currently, the laws governing motorcyclist do not protect its citizens across all states and allows for increased mortality and severity of injuries for non-helmeted motorcycle riders. The State of Texas currently mandates a partial law with no follow through plan to ensure the adherence and safety of its riders. To support citizens in the State of Texas, this health policy must insure best practice and the safety of everyone.

Policy objectives include:

1. Reduction of the incidence of deaths associated with non-helmeted motorcycle riders.
2. Reduction of the incidence of head injuries with non-helmeted motorcycle riders.
3. Reduction of healthcare costs associated with non-helmeted motorcycle riders.

Policy options and alternatives. The issue of enforcing the partial helmet law is with the burden of proof falling on the officer observing the motorcyclist. It is a determination of whether or not the rider is over the age of 21, or has taken an educational class or determined to have an insurance policy. This does not provide safety for anyone and does nothing to help reduce the increasing incidence of deaths, severe injuries, and healthcare costs for non-helmeted motorcyclists. This increase in morbidity and mortality and health care costs, in sharp contrast with those who believe policy is an infringement on their personal rights, calls for reevaluating the need for new action (Houston & Richardson, 2007). According to several studies the most

significant policy showing a reduction of mortality and severity of injuries was the policy of universal law (University of Miami, 2009; Reinberg, 2012). In the state of Texas, policy options and alternatives include:

1. Do nothing option: continue with current partial law.
2. Current partial law with mandated insurance coverage of a minimal of $100,000 for all motorcyclists.
3. Policy to mandate universal helmet law.

The evidence amongst many studies concludes that the universal helmet laws are effective and result in lives saved (Reinberg, 2012).

Evaluation Criteria

Evaluation of each alternative policy option will be conducted by application of the following criteria:

Criterion 1: Likelihood of motorcyclists' support.

Criterion 2: Likelihood of public health officials' support.

Criterion 3: Health risk related to traumatic brain injury (TBI).

Criterion 4: Likelihood of legislative support.

Analysis of Policy Alternative Option 1: Policy for partial helmet law

Criterion 1: Likelihood of motorcyclists' support – pro. There is a higher likelihood of motorcyclists to wear a helmet in states with partial laws than in states without helmet laws. According to the CDC, on average 64% of fatally injured motorcyclists were not wearing helmets in states with partial law compared to 79% in stats without helmet law (CDC, 2012).

Criterion 1: Likelihood of motorcyclists' support – con. Research shows that partial helmet laws do not motivate riders to wear a helmet (National Highway Traffic, 2005).

According to CDC (2014), repealing helmet laws from universal to partial law, 60% of fatally injured minors were non-helmeted compared to 22% in universal helmet laws states from 2008-2010. This is despite the partial helmet law requiring all minors to wear a helmet (National Highway Traffic, 2011).

Criterion 2: Likelihood of public health officials' support – pro. Partial law only mandates helmet use for riders younger than 21 years old (Houston et al., 2007). Despite the law not mandating all motorcyclists to wear a helmet, the younger ones would have some protection by wearing a helmet. This would in return decrease the number of fatalities due to non-helmet use. This is more likely to get health official approval than no helmet law at all.

Criterion 2: Likelihood of public health officials' support – con. Identifying partial helmet law violations is problematic and difficult to enforce (Houston et al., 2007). A motorcyclist cannot be stopped for the sole purpose of determining whether they have completed a training course or have insurance (Texas Motorcycle Helmet Law, 2002-2014). This would not motivate any motorcyclist to wear a helmet and therefore, this law would be less likely to receive support from public health officials.

Criterion 3 – Health risk related to TBI - pro. According the CDC, a higher percentage of motorcyclists are more likely to wear a helmet in states with partial law than states without a law (CDC, 2012). This in return would decrease the number of riders with TBI in states with partial laws compared to states with no helmet law at all.

Criterion 3: Health risk related to TBI – con. The risk of suffering a serious TBI is 37% higher in partial law states compared to universal law states in young riders after a motorcycle crash (Weiss, Agimi, & Steiner, 2007). In 2010, 42% of motorcyclists who were fatally injured were non-helmeted (National Highway Traffic, 2012). There is no evidence that

operator licensing and training, traffic laws and enforcement, and educational programs and campaigns reduce the number of motorcycle crashes that lead to TBI (CDC, 2014).

Criterion 4: Likelihood of legislative support – pro. Federal and state legislatures continue to use their flexibility to create laws and strategies to support safety for motorcyclists and their passengers including licensing and education (Shinkle and Teigen, 2013).

Criterion 4: Likelihood of legislative support – con. As the U.S. Department of Transportation moved in 1976 to assess financial penalties on states without helmet laws, Congress responded to state pressure by revoking federal authority to assess penalties for noncompliance (National Safety and Research Communications, 2014). Therefore there is no pressure from federal government on states to enforce helmet laws.

Analysis of Policy Alternative Option 2: Continue partial law with mandated insurance coverage $100,000 for all motorcyclists

Criterion 1: Likelihood of motorcyclists support – pro. Non-helmeted motorcyclists are less likely to have health insurance coverage (Hundley, Kilgo, Miller, Chang, Hensberry, Meredith, & Hoth, 2004; Parkland Health & Hospital System, 2014). Therefore, by imposing mandatory minimum medical benefit coverage for riders, in case of a crash, their medical expenses will be covered.

Criterion 1: Likelihood of motorcyclists support – con. According to the CDC (2014), motorcyclists' compliance is low because partial laws are difficult to enforce. Therefore, This law would be only enforced when a rider is pulled over for another violation like speeding (Houston et al., 2007). Therefore, the motorcyclists are less likely to comply with the new law since it is difficult to enforce.

Criterion 2: Likelihood of support from public health officials – pro. Motorcycle crashes create a burden to society, consuming public funds for emergency response, emergency room costs, and insurance premiums (Derrick & Faucher, 2009). Non-helmeted motorcycle riders are less likely to have health insurance. Therefore the majority of their medical expenses are paid for by public funds, with Medicaid accounting for over half of all charges (Hundley et al., 2004). This means that their medical expenses would not be paid/covered in case of a motorcycles crash. Having a mandatory medical coverage for riders would help pay for these expenses.

Criterion 2: Likelihood of support from public health officials – con. Public health officials subscribe to the idea that motorcycle helmet safety laws are designed to protect lives and reduce the impact of economic losses due to injury or death (Cherry, 2010). Adding a mandatory minimum medical benefit to the motorcyclist does not encourage helmet use that is the only proven way to prevent fatal injuries.

Criterion 3 – Health risk related to TBI - pro. According to the CDC, the average cost of TBI increased after the universal helmet law was repealed. In addition, non-helmeted motorcyclists are less likely to have health insurance coverage. Having a mandatory minimum medical benefit would help alleviate the economic burden, though not decreasing the mortality and morbidity caused by motorcycle crashes.

Criterion 3: Health risk related to TBI – con. After the repeal of the universal helmet law in Texas, the severity of TBIs worsened for motorcyclists, resulting in the average treatment cost per crash increasing from $4585 to $22,531 (Derrick & Faucher, 2009). Medical expenses with severe TBI are 13 times higher than the cost to those who did not have a TBI (Cook, Kerns, Burch, Thomas & Bell, 2009).

Criterion 4: Likelihood of legislative support – pro. Following 30 months of the repeal of the Florida universal helmet law, only one in four motorcyclists who was hospitalized had medical costs less than $10,000, which is the minimum medical insurance coverage (Ulmer & Northrup, 2005). In addition, non-helmeted riders are less likely to have health insurance, therefore more likely to have their medical expenses paid by government-funded healthcare (Hundley et al., 2004). This would incline the legislature to support the mandatory medical benefits that would cover increased medical expenses.

Criterion 4: Likelihood of legislative support – con. The current Texas partial helmet law does not require the riders to have any medical benefits in the event of a motorcycle accident. In 2009, Senate Bill 1967 was signed into law in Texas, removing the minimum of $10,000 in health insurance for injuries incurred in a motorcycle accident (Texas Department, 2000-2011). Therefore, repealing this law to obligate mandatory $100,000 benefit coverage might not receive legislative support.

Analysis of Policy Alternative Option 3: Universal Helmet Law

Criterion 1: Likelihood of motorcyclists support – pro. Only the universal helmet law is proven to increase helmet use (National Highway Traffic, 2011). Unlike other motorcycle safety measures that include operator training, licensing, enforcement of traffic laws, educational programs and campaigns, the universal helmet law costs little to initiate and reaches all motorcyclists (National Highway Traffic, 2011). Therefore, the motorcyclists will most likely abide by the law, as it will be easier for the traffic officials to enforce the law.

Criterion 1: Likelihood of motorcyclists support – con. Some groups believe that helmet laws are a form of government intrusion and believe safety training for motorcyclists is a better way to keep motorcyclists safe and prevent injuries (Shinkle & Teigen, 2014). There are

varying views on the balance between safety and personal rights when it comes to mandating the general population to wear helmets (Houston & Richardson, 2007).

Criterion 2: Likelihood of public health officials support – pro. According to the CDC (2014), the American Public Health Association, the American Association of State Highway and Transportation Officials, and the National Safety Council are some of the organizations that support motorcycle helmet laws. The Department of Transportation (DOT) recommend wearing a helmet that meets their standards as the single most effective way of reducing injuries from motorcycle crashes (National Highway Traffic, 2011).

Criterion 2: Likelihood of public health officials support – con. In order for their support to be felt, both public health officials and health care professionals would need to lobby. However, most of their time is used for patient care and therefore their presence is not felt for policy making gatherings/meetings.

Criterion 3 – Health risk related to TBI - pro. TBI is a leading cause of motorcycle crash deaths (National Highway Traffic, 2011). Wearing a helmet is the single most effective means of reducing the number of people who get injured from a motorcycle crash (National Highway Traffic, 2011). Helmet use reduces the risk for head injury by 69% (Liu, Ivers, Norton, Boufous, Blows & Lo, 2008).

Criterion 3: Health risk related to TBI – con. According to the statistics provided by the CDC in 2012, despite the universal law being in place in 1997, there was not 100% helmet use compliance by motorcyclists. That means there is still the probability of TBI despite the universal helmet law being in place.

Criterion 4: Likelihood of legislative support – pro. The United States saved three billion due to helmet use is 2010. However, the government could have saved an additional $1.4

billion if all motorcyclists had worn helmets (CDC, 2014). In the State of Florida, the cost of treating head injuries from motorcycles crashes rose to $44 billion just 30 months after the universal law was repealed (Ulmer & Northrup, 2005). Their state legislature identified this as an economic/financial problem. For this reason, legislation should continue to propose bills to create helmet requirements. Some state legislatures have unsuccessfully attempted to weaken their helmet laws (Shinkle & Teigen, 2013).

Criterion 4: Likelihood of legislative support – con. Forty states considered more than 180 bills related to motorcycle helmets or rider training during the 2012 legislative session (Shinkle & Teigen, 2014). Motorcycle helmet requirements continue to be an important issue in state legislatures. However, some states seek to eliminate the laws stating personal liberty concerns and a need to focus on safety education (Shinkle & Teigen, 2013). National Highway Traffic Safety Administration (NHTSA) awarded almost $46 billion to states from 2006 to 2012 in motorcycle safety grants to fund research on increasing motorcycle helmet use in states without a universal helmet law. However, the congress allowed the grants from the NHTSA to be used only for motorcyclist training and awareness (Shinkle & Teigen, 2013).

Comparison of Alternatives

Appendix A clarifies policy options #1, #2 and #3. Policy option alternative #1 (partial helmet law) failed to achieve a significantly high score on most criteria. In order for this policy to be attractive, it would require support from the motorcyclists and legislators. In addition, it is important that health policy officials agree that a partial helmet law is better than having no law at all.

Policy option alternative # 2 (Continue partial law in addition to mandatory $100,000 minimum medical benefits) is an acceptable policy. However, it does not protect the

motorcyclist from TBI, but only covers their medical expenses. The objective of the policy related to motorcycle helmet safety is to save lives while reducing the impact of economic losses due to injury or death.

Policy option alternative #3 (universal helmet law) gets the support of the public health officials and legislators in addition to being the only proven way to reduce TBI. In addition, it is the only proven way to increase helmet use among motorcyclists (National Highway Traffic, 2011).

Recommended Policy

According to the analysis of data and evaluative criteria from the scorecard assessment, the recommended policy option alternative is #3: Universal helmet law policy. This policy will require that all motorcyclists will be required by law to wear a helmet. Compared to policy option #1, which received a scorecard report of 0 and policy option #2 that received a scorecard report of 2, alternative #3 achieved the highest scorecard rating of 4. Even though a policy requiring all motorcyclists to wear helmets when operating or riding on a motorcycle may seem to remove autonomy from the list of ethical considerations, it is clear that a universal helmet law will prevent injury and save lives. Many people concerned with their autonomy are those who may oppose a universal law such as the one proposed here. In the United States, individualism and freedom are valued highly, and thus, autonomy of action is typically placed above the good of the group (Kjervik & Brous, 2010). However, the objectives of this law will be to:

- Reduce the incidence and severity of motorcycle-related injuries, particularly head injury
- Reduce the associated direct and indirect economic costs of motorcycle-related injuries

- Reduce the physical, psychological and economic devastation suffered by victims and family of injured motorcyclists, especially where long-term disability due to head injury is involved (Rowland et al., 1996).

Summary

> As stated by Rowland, Rivara, Salzberg, Soderberg, Maier, & Koepsel (1996), Motorcycle-related deaths and injuries are an important cause of morbidity and mortality in the United States. The injury severity and consequences of a motorcycle crash are far greater than for an automobile crash. Most motorcycle related deaths involve head injury, and motorcycle helmets significantly reduce the risk of death attributable to head injury. (p. 41)

Data from governmental sources clearly demonstrate the degree to which motorcycle helmets are worn when universal laws are in place. Information found on appendix A reveals the positive impact that strengthening helmet laws has had on helmet wearing behavior in several states. Non-helmeted motorcycle crash patients suffer more severe brain injuries, consume more resources, and have the worst payor mix. Society bears a large financial burden for these uninsured non-helmeted patients. There is a survival advantage for helmeted patients. All states [including Texas] should have universal motorcycle helmet laws that are aggressively enforced (Croce et al., 2009).

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Appendix A

Policy Comparison Scorecard

		ALTERNATIVES	
	1	2	3
	Partial Helmet Law (Current Law)	Partial Helmet Law Everyone <21 YOA & Education class for licensure $100,000 Health Ins. Policy	Universal Helmet Law All motorcyclists required to wear helmets
EVALUATION CRITERIA			
Likelihood of Legislative Support	—	+	+
Likelihood of support from public health officials	—	+	++
Health risk related to Head Injury	+	+	++
Likelihood of support from Motorcyclist population	+	—	—
	2/2	3/1	5/1
Score for Each Alternative	0	2	4

Appendix B

The Positive Impact of Strengthening Helmet Laws

State (Year of enactment)	Under partial/no law	Under universal law
Nebraska (1989)	15%	85%
Washington (1990)	41%	80%
California (1992)	50%	99%
Maryland (1992)	25%	81%
Louisiana (2004)	60%	99%

All five states gained a substantial increase in helmet use in the year after the universal helmet law was enacted.

The Negative Impact of **Weakening** Helmet Laws

State (Year of repeal)	Under universal law	Under partial law
Arkansas (1997)	97%	52%
Texas (1997)	97%	66%
Kentucky (1998)	96%	65%
Louisiana (1999)	100%	52%
Florida (2000)	99%	53%
Pennsylvania (2003)	82%	58%

All six states showed a substantial decrease in helmet use in the year after the universal helmet law was repealed.

Centers for Disease Control and Prevention. National Center for Prevention and Control.
http://www.cdc.gov/motorvehiclesafety/mc/guide/laws_alt.html#positi