Addressing alcohol-impaired motor vehicle accidents: the efficacy of lowering the legal driving BAC limit in the U.S.

Vincent Busque, December 2019

Introduction:

In the United States, alcohol-impaired driving accidents account for almost 30% of all driving deaths. Over 10,000 people die each year in motor vehicle accidents involving an alcohol-impaired driver.[1] The costs associated with alcohol-related crashes is more than $44 billion.[1] Not only can motor vehicle accidents involving alcohol lead to serious injuries and possibly death, but they can also result in a huge economic cost from medical costs, legal fees, and a loss in productivity. Policy measures have aimed to reduce the prevalence of these accidents by enforcing blood alcohol concentration (BAC) limits, implementing sobriety checkpoints, educating the public about the dangers of drunk-driving, and the ability for law enforcement to revoke or suspend licenses for those who drive under the influence. Specifically, the BAC driving limit in the United States is .08g/dl in all states except Utah, which has a BAC driving limit of .05g/dl. Lowering the BAC limit from .08g/dl has the potential to save lives. In this brief, we will examine the potential impact of lowering the BAC limit, focusing on the extent to which it could prevent alcohol-related motor vehicle deaths. To do so, we will first analyze the impact of initially lowering the BAC limit from .10g/dl to .08g/dl in the U.S., and then explore evidence from a variety of perspectives on whether the United States should further lower the BAC limit to .05g/dl on a National scale.

Background:

In the United States, 29 people die every day from an alcohol-related motor vehicle accident.[1] This rate is lower than it has been in the past, as a result of policy changes, improvements in motor vehicle safety, and changes in public sentiment around driving under the influence. Growing bodies of research have aided this transition, especially concerning the effects that alcohol has on driving-related tasks.

Legal driving limits have been enforced for the majority of the last century, with the first limit starting at .15% BAC, and gradually being lowered to .08% by 2002.[2,3] States have generally been able to set their own BAC limits as long as those limits met the national limit. With a national limit of .10%, Utah became the first state to lower their BAC driving limit to .08g/dl in 1986.[2,3] Over the next 15 years, 28 states adopted a BAC driving limit of .08g/dl.[4] Finally, in 2002, Congressed passed national legislation that would remove funding for highways from states who did not adopt the .08% driving limit.[3,4] More recently, Utah has passed legislation to lower their BAC level to .05g/dl, matching the BAC limits in many European countries.[3,5]

Literature Review

The impact of lowering the BAC driving limit from .10g/dl to .08g/dl

Between 1982 and 2002, 28 states lowered their legal driving limit from .10% to .08%, allowing quasi-experimental analyses to be conducted on the effectiveness of .08 laws. In

a meta-analysis consisting of 14 studies examining this impact, lowering the BAC limit from .1g/dl to .08g/dl resulted in an average of a 7% decrease in alcohol-related fatal crashes.[3] Although there was considerable variation between states due to differences with enforcement policies and public sentiment towards drunk driving laws, most states experienced a significant decline in drinking-related crashes, amounting to an estimated 360-500 lives saved each year.[3,4] In a study examining the effectiveness of interventions on reducing alcohol-impaired driving, Shults et al. found sobriety checkpoints and the drop in the legal driving BAC limit to significantly reduce alcohol-related crashes and fatalities.[6]

Lab studies: how driving skills are affected at varying BACs

Several lab studies have examined the impact of varying BAC levels on driving skill performance. In a systematic review conducted by Moskowitz, some driving skills were impaired starting at a BAC level of .02%.[7] Of the 112 lab studies in the review examining the impact of BAC level on driving performance, 94% of the studies reported impairment of driving related skills by .08%.[7] In addition, according to a study by Zador et al., driving with a BAC of between .05 and .07 results is associated with a 6-17x higher likelihood of getting into a fatal crash.[3] Many lab studies relied on driving simulators and attention tests as an accurate way to measure driving performance. Subjects included both men and women at various BAC levels in different driving environments.[3,8] While most studies found driving impairment beginning at lower BACs than the current legal limit, Moskowitz calls for more research on the interaction between alcohol and drowsiness on driving performance because the effects of alcohol on performance may be exacerbated late at night, when most alcohol-related accidents occur.[6]

The impact of lowering BAC driving limits to .05 in other countries

Several developed countries around the world have lowered their BAC driving limits to .05%. In an Australian study looking at the impact of lowering the BAC driving limit in Queensland and New South Wales, fatal collisions reduced by 18% and 8% respectively.[3] After Austria decreased their BAC limit from .08% to .05%, they saw a 9.4% decrease in alcohol related crashes relative to the total number of crashes.[3] Similar trends were observed from implementation of .05% laws in other countries, however a potential confound is the degree of enforcement of these laws.[3,5] This trend towards the .05% BAC driving limit reached the United States at the end of 2019 when Utah became the first state to decrease their BAC limit to .05%.[3]

Challenges to implementing lower BAC limits

The primary argument against lowering the legal driving BAC limit is that people believe it restricts their individual freedom.[5,9] In their paper, Morain and Largent discuss the ethical acceptability of lowering the legal BAC limit to .05 in the US. They argue that it is the government's duty to protect its residents.[5] Not only does driving under the influence affect drivers themselves, but it also places other people on the road at risk. 40% of alcohol related fatalities are individuals who are not drunk drivers.[5] Driving under the

influence affects the loved ones of everyone involved, and children are especially vulnerable, representing 214 fatalities from alcohol-related driving accidents in 2016.[5] Morain and Largent conclude that decreasing the BAC level is a necessary way to protect people, but if the legal driving limit were to decrease, enforcement of the new policy would have to follow in line.

In a survey conducted my Fiorentino, a group of law enforcement officers, persecutors, and defense attorneys were asked a series of questions regarding enforcement of a .05g/dl BAC limit if it were to be imposed. While they recognized the policy would save lives, the surveyed group concluded there needed changes to sobriety field tests in order to be more appropriate for new the .05 limit.[9] In addition, they emphasized the need to educate the public about the possible dangers of driving with a BAC level between .05 and .07 in order for the new policy to be effective.[9]

Policy Implications

Reduce the legal driving BAC limit to .05g/dl

In 2013, the National Transportation Safety Board recommended all states to lower their BAC driving limit to .05% as an effective way to prevent excess deaths and injuries from alcohol-related driving accidents.[10] The United States government should follow this recommendation and require all states to set their BAC limit to .05% or lower.

Decreasing the legal BAC driving limit to .05g/dl across the United States will save lives, prevent injuries, and save money. Lowering the BAC limit from .10 to .08 proved effective in reducing alcohol-related driving fatalities by 7%, saving between 360 and 500 lives a year.[3,4] Lowering the BAC limit from .08% to .05% will save an estimated 500 to 1700 additional lives each year.[4,11] Other countries have already adopted this policy, and have seen significant reductions in alcohol-related driving accidents. Furthermore, the United States government has an ethical responsibility to decrease their BAC driving limits since alcohol-related driving incidents do not only affect those who drink, but they also affect those around them. While challenges regarding the enforcement of the .05% limit remain, enough evidence points to the need to lower this limit in the United States.

As some critics claim that a lower BAC limit restricts their individual freedom to drink socially, alternative options such as public transportation and ride-sharing companies such as Lyft and Uber become more vital. Recent expansions to these sectors provide an alternative option from driving under the influence.

Since Utah recently lowered their BAC limit to .05g/dl, policymakers will pay close attention to the impact this policy has on alcohol-related crashes. Questions remain regarding the accompanying implementation and political feasibility of this policy on a national scale, but Utah can serve as a model for the rest of the country to follow. The evidence from many areas all point towards the benefit of lowering BAC driving limits but the longer we wait before implementing this change, unnecessary lives will be lost.

Additional Resources:

1. Motor Vehicle Safety, Impaired Driving: https://www.cdc.gov/motorvehiclesafety/impaired_driving/index.html
2. DUI Statistics: https://www.bactrack.com/blogs/expert-center/35040645-dui-statistics
3. Blood Alcohol Chart for Estimation: http://www.breathalyzeralcoholtester.com/alcohol-chart-estimation/
4. Drunk-driving laws by country/area: https://assets.weforum.org/wp-content/uploads/2015/11/gho_road_safety_alcohol.png

References:

1. Impaired Driving: Get the Facts. (2019, March 22). Retrieved from https://www.cdc.gov/motorvehiclesafety/impaired_driving/impaired-drv_factsheet.html.
2. Drunk driving in the United States. (2019, November 14). Retrieved from https://en.wikipedia.org/wiki/Drunk_driving_in_the_United_States#History.
3. Fell, J. C., & Voas, R. B. (2006, July 7). The effectiveness of reducing illegal blood alcohol concentration (BAC) limits for driving: Evidence for lowering the limit to .05 BAC. Retrieved from https://www.sciencedirect.com/science/article/pii/S0022437506000478.
4. Wagenaar, A. C., Maldonado-Molina, M. M., Ma, L., Tobler, A. L., & Komro, K. A. (2007, September 29). Effects of Legal BAC Limits on Fatal Crash Involvement: Analyses of 28 States from 1976 through 2002. Retrieved from https://www.sciencedirect.com/science/article/pii/S0022437507000886.
5. Morain, S., & Largent, E. (2019). Ethical Acceptability of Reducing the Legal Blood Alcohol Concentration Limit to 0.05. *American Journal of Public Health*, *109*(5), 709–713. doi: 10.2105/ajph.2018.304908
6. AShultsPhD, R., WElderMEda, R., ASleetPhD, D., LNicholsPhDd, J., OAlaoMAc, M., Vilma, … Task Force on Community Preventive Services. (2001, October 25). Reviews of evidence regarding interventions to reduce alcohol-impaired driving. Retrieved from https://reader.elsevier.com/reader/sd/pii/S0749379701003816?token=552AD6EDCDDF7C254F54F02ABD5780E83C0420EEB8804C6E1EA04DFAED7AFA9BC2F1E2A4622EBE5402BC9BF1D7A7302D.
7. Moskowitz, Herbert, & Florentino. (2000, April 1). A review of the literature on the effects of low doses of alcohol on driving-related skills. Retrieved from https://rosap.ntl.bts.gov/view/dot/1677.
8. Moskowitz, Herbert, Burns, Marcelline, Fiorentino, Dary, … Southern California Research Institute. (2000, August 1). Driver characteristics and impairment at various BACs. Retrieved from https://rosap.ntl.bts.gov/view/dot/1635.
9. Fiorentino, D. D. & Martin, B. D. (2018). Survey regarding the .05 blood alcohol concentration limit for driving in the United States. Traffic Injury Prevention. doi: 10.1080/15389588.2018.1424840
10. National Transportation Safety Board. (n.d.). Safety Report on Eliminating

Impaired Driving. Retrieved from https://www.ntsb.gov/news/events/Pages/2013_Impaired_Driving_BMG-FAQs.aspx.

11. Fell, J. C. (n.d.). *Evidence to Action*. Washington DC. Retrieved from http://files.www.alcoholpolicyconference.org/presentations/C-20_AP18_-_FELL_-_BAC.pdf