Alcohol Limits and Public Safety

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ABSTRACT: On May 14, 2013, the National Transportation Safety Board (NTSB) recommended lowering the legal blood-alcohol limit to 0.05 g/dL for motor vehicle operators in the United States, in an effort to reduce the risk of injuries and deaths caused by a driver’s alcohol impairment (NTSB/SR-13/01). This recommendation has prompted other organizations and agencies, including the National Safety Council, to evaluate and consider supporting this action. In order to determine the scientific and legal feasibility and advisability of lowering or establishing 0.05 per se laws, we examined 554 alcohol-related publications. Risk factors, instrument reliability, law enforcement, and adjudication issues were considered in this overview of the literature. The extensive scientific literature reviewed provides ample support for lowering the operation of motor vehicle alcohol limits to 0.05, and for supporting the NTSB recommendations. Research clearly demonstrates that impairment begins at very low concentrations, well below the recommended NTSB limit, and increases with concentration. Lowering the limit to 0.05 will save many lives and prevent injuries. Breath, blood, and saliva samples have proved to be accurate and reliable specimens for legal acceptability in a court of law.

KEY WORDS: Adjudication, alcohol, concentration, enforcement, impairment, instruments, limits, risk.

INTRODUCTION

Recently the National Transportation Safety Board (NTSB) recommended lowering the legal blood-alcohol limit to 0.05 g/dL for motor vehicle operators in the United States [75]. This recommendation has prompted other organizations, including the National Safety Council (NSC), to consider this proposed action. The authors were asked to evaluate the NTSB recommendation and to submit a scientific report on the feasibility of lowering the blood-alcohol limit to 0.05 g/dL for drivers. The authors have conducted this study based on the available published scientific literature and herein provide an overview of alcohol limits and public safety. Alcohol concentrations in this article are expressed in g/dL in blood and g/210 L in breath.

Approximately 133 million (51.8%) Americans aged 12 or older reported being current users of alcohol in 2012; approximately 58.3 million (22.6%) reported participating in binge drinking and approximately 15.9 million (6.2%) reported being heavy drinkers [86]. The direct and indirect economic costs of alcohol abuse have been estimated at $223.5 billion for 2006 [11]. This does not include the psychological toll associated with loss of human life and recovery from serious injuries.

Robert F. Borkenstein, in his groundbreaking study correlating accident rates with breath-alcohol concentrations, provided the first clear and convincing scientific evidence that individuals who drink and drive are at greater risk of being involved in a traffic crash [10]. His study has been repeated several times using more modern techniques by research scientists with similar results (Figure 1) [8,56,57,93]. It has been proved that the relative risk of having a motor vehicle crash increases as a function of alcohol concentration with, for example, an 18% increased crash risk at 0.04. It took many years after Professor Borkenstein’s original work was published for the documented dangers associated with drinking and driving to be recognized in the form of per se driving laws. Professor Borkenstein’s original research is also supported...