Leveraging and Enhancing Alcohol Countermeasures to Reduce Drugged Driving: Enforcement, Legal and Policy-based Approaches

The effect of alcohol on crash risk has been well studied. Today, experts rely on proven measurement techniques to assess alcohol levels and have extensively examined how alcohol affects driving behavior. Research and data collection on drugs other than alcohol is not as far advanced, in part because of the sheer number of available drugs — whether prescription, over-the-counter or recreational — as well as the myriad potential interaction effects when multiple drugs are used. The available evidence suggests that many people drive with drugs other than alcohol present in their system (Kelley-Baker et al., 2017; EMCDDA, 2012). Unfortunately, in contrast to alcohol-impaired driving, the available research-based evidence regarding effective countermeasures for drug-impaired driving is still nascent. That said, it is possible that data and experiences from the alcohol-impaired driving arena can be leveraged to advance the suite of countermeasures against drugged driving. This research brief describes a project that solicited input from subject matter experts (SMEs) across the United States regarding the potential for alcohol-impaired driving countermeasures to be adapted as drugged or drug-impaired driving countermeasures. Throughout, the term 'drug' refers to any type of substance other than alcohol that can contribute to impaired driving. The outcomes from the project were grouped into three categories of countermeasures: enforcement-related countermeasures, legal- and policy-based countermeasures, and behavioral and educational interventions. This brief describes enforcement-related and legal- and policy-based approaches.

METHOD

The purpose of this project was to solicit input regarding current alcohol countermeasures that could be used to reduce drug-impaired driving. Over the course of the project, five workshops were held (Washington, D.C.; Atlanta, Georgia; Denver, Colorado; Irvine, California; and Seattle, Washington) between June and August 2016. Seventy-seven SMEs participated in these workshops. These groups included experts from a variety of fields, including traffic safety, law enforcement, toxicology, advocacy, substance abuse treatment, and alcohol and cannabis licensing. To guide the discussion, the SMEs were provided with a list of countermeasures, including those in the domains of enforcement, legislation, and education. They were also encouraged to bring new ideas to the table. In identifying those countermeasures that could potentially help reduce drug-impaired driving, SMEs were asked to consider the impact on driving behavior as well as potential for rapid adoption. The following section includes a summary of some of the countermeasures discussed. A brief description of each countermeasure is provided, along with some relevant background literature, followed by the strengths and limitations as well as recommendations for potential application to drug-impaired driving based on input from the SMEs.

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COUNTERMEASURES

Enforcement-Related Countermeasures	High Visibility Enforcement and Sobriety Checkpoints	
	Standardized Field Sobriety Tests (SFST)	
Legal and Policy-Based Countermeasures	Administrative License Revocation (ALR) / Administrative License Suspension (ALS)	*This Research Brief*
	Minimum Age and Zero Tolerance Laws	
	Per Se Limits	
Behavioral and Educational Interventions	Screening, Brief Interventions and Referral to Treatment (SBIRT)	*In a Separate Research Brief*
	Educational Programs	
	Media Campaigns	

Enforcement-Related Countermeasures

High Visibility Enforcement and Sobriety Checkpoints

High Visibility Enforcement (HVE) involves the combination of proactive law enforcement efforts, such as sobriety checkpoints and saturation patrols, with media or other public outreach campaigns to educate the public on a specific traffic safety issue and promote compliance with a related law (NHTSA, 2017). This countermeasure specifically targets distinct areas, days, and times that have been identified as most likely to be where and when an alcohol and/or drug-impaired driving incident will occur, based on crash and arrest data (Goodwin et al., 2015). At sobriety checkpoints, for example, officers are set up on the roadway to randomly stop drivers for signs of alcohol or drug impairment. As of December 2016, sobriety checkpoints have been used in 38 states in the United States as a detection and deterrent strategy for reducing impaired driving (Governor's Highway Safety Association, 2016). Other strategies include saturation patrols, which involve an increase in enforcement efforts to target a specific area, resulting in the identification and arrest of impaired drivers (NHTSA, 2002). With high visibility enforcement, these approaches are enhanced with media and other public outreach in order to focus attention on the issue.

Sobriety checkpoints and saturation patrols can lead to increased apprehension rates, which research has shown deters impaired driving (Sykes, 1984). Moreover, studies have shown that increasing driving under the influence (DUI) arrest rates by 10% is associated with a 1% reduction in DUI-involved crash rates (Fell et al., 2014). Similarly, Yao et al. (2016) found that reductions in fatal crashes were associated with higher DUI arrests per capita.

Studies have shown that extra patrol cars manned by specialty officers cause a reduction in the number of nighttime crashes involving alcohol (e.g., Voas & Hause, 1987). In a systematic review, Goss et al. (2008) found that studies on the effects of increased police patrols generally reported fewer crashes and fatalities, but that the studies included in their review tended to be of poor quality and suffer from other limitations. As drivers observe increased numbers of traffic stops, their perception of overall enforcement of traffic laws is likely to increase (Fell et al., 2014; Thomas et al., 2015). Goodwin et al. (2015) noted that the most effective HVE patrols are highly publicized events that take place at regular intervals.

Sobriety checkpoints can also deter alcohol-impaired driving by increasing the perceived risk of arrest (Goodwin et al., 2015; Shults et al., 2001). Research indicates that sobriety checkpoints reduce fatal crashes involving

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alcohol-impaired driving (Anderson et al., 2009; Bergen et al., 2014). The degree of deterrence that is achieved from sobriety checkpoints, and by extension the effectiveness of sobriety checkpoints in reducing alcohol-impaired driving, is determined in part by the amount of publicity prior to the deployment of sobriety checkpoints and the visibility of the sobriety checkpoint to the general public (Shults et al., 2001; Ross, 1992). Thus, it is important to couple such efforts with HVE.

Strengths. The SMEs noted that HVE and sobriety checkpoints have proven to reduce the incidence of alcohol-impaired driving and related crashes and could have an impact on deterring drug-impaired drivers by increasing the fear of arrest and apprehension. Adapting HVE and sobriety checkpoints for drug-impaired driving will require additional considerations, including officer training and conducting blood tests on drivers suspected of being under the influence of drugs. However, utilizing HVE to communicate messages about drug-impaired driving enforcement efforts could have immediate deterring impacts. HVE is a well-known, supported and employed approach used by law enforcement agencies around the country. Thus, HVE is likely to gain support as a drug-impaired driving countermeasure from law enforcement officers.

Limitations. The effectiveness of HVE in detecting and deterring drug-impaired driving depends on many factors. Officers may not be aware of the physical signs and indicators of drug impairment. As such, the presence or availability of a specially trained officer (e.g., Drug Recognition Expert (DRE), Advanced Roadside Impaired Driving Enforcement (ARIDE)-trained officer) is an important element. This is especially relevant as HVE efforts often require a significant number of law enforcement officers who are drawn from other enforcement activities.

Moreover, typical crash and arrest data used for alcohol-impaired driving enforcement is often used to target program locations and time of day (see e.g., Data-Driven Approaches to Crime and Traffic Safety (DDACTS); National Institute of Justice, 2014). This information, however, is often unavailable and may have significant limitations when applied to drug-impaired driving. There is an indication that drug use and driving do not necessarily emulate the patterns typical of alcohol use and driving (Kelley-Baker, et. al. 2017).

Recommendations. Based on the effectiveness of sobriety checkpoints and general HVE efforts as documented by the scientific literature, the opinions of the SMEs, and the potential ease of adaptation, these appear to be promising countermeasures to deter drug-impaired driving. Both were favored by many SMEs as leading countermeasures to reduce drug-impaired driving.

Importantly, officers must be aware of the physical signs and sensory indicators of drug impairment. Officers may not be trained to detect drug-impaired driving. Therefore, it is recommended that, in addition to increasing training, a standardized guide be developed for law officers to detect drug-impaired driving during HVE — similar to the existing police guide on alcohol-impaired driving (NHTSA, 2010). Such a guide would identify behaviors associated with drug impairment. Trained officers such as DREs or ARIDE-trained officers should be included in HVE operations intended to address drug-impaired driving.

Further, to speed up the process of drawing blood samples from alleged offenders, on-call judiciary members and electronic warrants should be made available in conjunction with HVE. In addition, law enforcement officers may be trained as phlebotomists to facilitate the processing of blood specimens on-site or at other venues.

Standardized Field Sobriety Tests (SFST)

Standardized Field Sobriety Tests (SFST) are a series of three regulated tests designed to estimate whether an alcohol-impaired driver is at or above the per se limit of .08 BAC (Goodwin et al., 2015). The SFST battery consists of the One-Leg Stand (OLS), Walk-and-Turn (WAT), and Horizontal Gaze Nystagmus (HGN) tests (Goodwin et al., 2015). Each test in the battery of SFST has a set number of clues the officer uses to determine if the tested individual is above the per se limit of intoxication by alcohol (Thompson, 2012).

In 1975, NHTSA sponsored research that led to the development of standardized methods for law enforcement officers to use when evaluating drivers suspected of driving under the influence. Since 1981, law enforcement officers have used the SFST, which are presently used by most agencies in all 50 states as standard pre-arrest procedures for evaluating drivers.

A number of studies have provided evidence validating the SFST as a reliable decision aid for discriminating

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between BACs above and below legal threshold. (Burns & Anderson, 1995; Burns & Dioquino, 1997; Stuster, 2006; Stuster & Burns, 1998). However, other studies have noted the potential methodological limitations of the empirical support for SFST (e.g., Rubenzer, 2008).

Strengths. The SMEs noted that arrest for DUI is most often based on performance on the SFST battery, regardless of the suspected impairing substance. Law enforcement officers must be taught to always administer the standard protocol of testing and focus on detecting impairment using the systematic methods and scoring criteria validated by the research. The SMEs also thought that the inclusion of the SFST battery in combination with other tests in the DRE evaluation could provide some evidence for detecting drugs other than alcohol. If conducted properly and in combination with additional training, SFST can be used by law enforcement officers to help in the detection of drug impairment.

Limitations. While the SFST battery has been validated for use in detecting BACs above the per se limit of 0.08, impairment by other substances is difficult to detect. Limited research has examined the effectiveness of the SFST as a stand-alone battery of tests for detecting specific or broad categories of drugs, and the results have been mixed, with the SFST only moderately sensitive to some drug categories. Making the assumption that the SFST is credible for detecting drug impairment may have repercussions for evidence admissibility in court proceedings and in setting precedence in case law. Importantly, the effectiveness of SFST in reducing the incidence of alcohol-impaired driving or associated crashes is largely unknown.

Not all law enforcement officers have been trained to administer the SFST battery and detect impairment; the number of trained officers varies from agency to agency. Additionally, once officers are trained, no provision requires follow-up or refresher training. As such, officers may receive the initial training and never receive any additional updates or assessments to ensure that their proficiency remains consistent with standards. While refresher training every two years is strongly encouraged, there is no nationally mandated requirement for it and states are responsible for determining additional training requirements.

Recommendations. The SFST was recognized by SMEs as a valuable detection strategy for impaired driving. While

studies have been conducted validating the SFST, these have primarily focused on detecting alcohol impairment. SMEs noted the SFST battery could be applied in determining drug impairment; however, further research and organizational efforts (i.e., NHTSA) should attempt to establish which of the SFST tests are most applicable for detecting impairment by drugs other than alcohol and explore ways to expand the number of meaningful standardized tests applicable to drugs other than alcohol.

SFST training should be expanded to increase the proportion of officers trained in the battery, and training should include a focus on proper administration. In addition, members of the judiciary and prosecutors should be encouraged to become educated in the SFST battery.

Legal and Policy-Based Countermeasures

Administrative License Revocation (ALR)/ Administrative License Suspension (ALS)

An Administrative License Revocation (ALR) or Administrative License Suspension (ALS) is a driver's license suspension that can be imposed on individuals arrested for driving under the influence (DUI) before any court involvement. If the driver submits to a chemical test and the results are at or above a legal limit, the license will be suspended immediately. If a driver refuses to submit to a chemical test, their license will also be suspended immediately (e.g., Goodwin et al., 2015).

Administrative license suspension policies have been shown to have significant effects in reducing alcohol-related fatal crash involvement (Williams et al., 1991; Beirness et al., 1997; Voas et al., 2000; Wagenaar & Maldonado-Molina, 2007; Asbridge et al., 2009). A recent study analyzed nine traffic policies, including ALR, to determine how they contribute to the effective prevention of alcohol-related fatalities. The study found that when the outcome measure was alcohol-involved motor vehicle fatalities per capita, ALR laws were the most effective (Chang et al., 2012).

Additionally, the length of the suspension period has been shown to impact the ratio of drinking drivers to nondrinking drivers in fatal crashes, with states having suspension periods of more than 91 days having significantly lower ratios than states with shorter suspension periods (Fell & Scherer, 2017).

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Strengths. ALR/ALS incorporates principles of "deterrence theory" that suggest the punishments must be severe enough to outweigh the benefits of the crime (severity), carry sure and certain consequences (certainty) and be administered promptly (swiftness). Traditionally, driving sanctions are carried out in courts using criminal procedures. This process is usually long and involved, and consequences can be lenient. The administrative process requires only evidence that the sanction is merited and is not concerned with determining guilt. Therefore, the process is relatively quick and certain in applying sanctions. ALR/ALS is thought to require few changes to effectively adapt to drug-impaired driving.

Limitations. Administrative per se laws generally apply only to alcohol. So, a driver who is arrested for being under the influence of only drugs often is not impacted by administrative suspensions. ALR/ALS is difficult to enforce for drug-impaired driving since a laboratory test may be required, the results of which may not be available for days or even weeks. Moreover, the absence of per se limits for drugs in many jurisdictions can render ALR/ALS unenforceable.

Many states lack ALR/ALS guidelines that outline the process for revoking a driver's license for drug-impaired driving. ALR/ALS is a reactive strategy that occurs post-arrest after the offender has driven under the influence of drugs. This strategy does not stop offenders from continuing to drive after forfeiture of license due to low perceived risk of penalty.

Recommendations. Based on the effectiveness of ALR/ALS as demonstrated by the peer-reviewed literature, the opinions of the SMEs, and the ease of adaptation of a countermeasure primarily designed to detect and deter alcohol-impaired driving, ALR/ALS appears to be a promising countermeasure to deter drug-impaired driving.

It is recommended that model procedures that states can use for guidance be developed for license revocation based on an arrest for driving under the influence of drugs. Existing policies for license revocation for alcohol-impaired driving may help guide the development of those for drug-impaired driving.

Some states have begun to utilize roadside oral fluid screening in a manner similar to preliminary breath tests (PBTs) for alcohol. No current research evidence is available suggesting its merit for ALR/ALS; however, since oral fluid can be collected in the field, officers can obtain evidence close to the time of the initial contact when signs of impairment are present, and this may reduce delays in obtaining toxicology results. However, although promising, the validation of roadside oral fluid testing is still under investigation.

Because some offenders may continue to drive with a suspended or revoked license, consideration for interventions that restrict mobility may be needed. These may include advocating for interventions such as vehicle license plate displays that alert officers of offending drivers, imposing a vehicle impound or seizure program, or electronic monitoring of offenders who have been sentenced to house arrest (NCHRP, 2003).

Minimum Age and Zero Tolerance Laws

Minimum age laws are designed to limit access to alcohol by restricting its purchase to those age 21 and older. Minimum age laws have been strongly linked to reductions in underage drinking and driving after consuming alcohol, as well as related crashes (Goodwin et al., 2015). To further reduce alcohol-related crashes, all states have enacted zero tolerance laws, which essentially establish that it is illegal for a person younger than the minimum legal drinking age to operate a motor vehicle with a positive BAC (Goodwin et al., 2015). As of 1998, all states have enacted zero tolerance laws for alcohol.

A substantial amount of research has evaluated minimum age laws, and to a lesser extent, zero tolerance laws. Overall, minimum age and zero tolerance laws have been found to reduce alcohol-related crashes, both fatal and nonfatal, among drivers younger than age 21 (Hoskin et al., 1986; Hingson et al., 1994; Voas et al., 2003; Hingson et al., 2004; McCartt et al., 2009; Carmona, 2010; Lovenheim & Slemrod, 2010; Wechsler & Nelson, 2010). Research indicates that enforcement of minimum age and zero tolerance laws leads to increased compliance among youth (McCartt et al., 2009). Research also shows that lowering minimum-age-laws restrictions from age 21 to 18 could reverse the reductions in alcohol-related crashes, leading to greater involvement in alcohol-related crashes by minors (Voas et al., 2003; Fell et al., 2008; McCartt et al., 2009; Lovenheim & Slemrod, 2010; Wechsler & Nelson, 2010).

Strengths. According to the SMEs, zero tolerance laws could work to prevent the use of illicit substances by

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minors. Minimum age and zero tolerance laws related to alcohol could serve as a framework for the development of similar laws related to drug use. Several states already have zero tolerance laws in place for illicit substances. Also, other states have zero tolerance laws for marijuana for youth in place.

Limitations. Minimum age and zero tolerance laws do not prevent the consumption of licit substances by those who are of age and are unlikely to reduce drug-impaired driving by those individuals. In addition, minimum age laws only prevent or discourage the use of licit substances and do not address illicit substances. Moreover, enforcement of minimum age and zero tolerance laws is not a priority for many law enforcement agencies due to competing demands, limited resources, and shifting community standards.

Recommendations. Minimum age and zero tolerance laws were recommended by SMEs because of their perceived effectiveness as well as the low cost of adaptation to deter drug-impaired driving. That said, as with alcohol, minimum age and zero tolerance laws will need to be enforced to have the intended results. If these laws are not enforced, there is a perception they are not important, and minors can still consume drugs without penalty. Some consideration would be needed in cases where drugs were legitimately prescribed to individuals.

Per Se Limits

Per se limits are laws that create a legal standard for alcohol-impaired driving. Per se limits make it illegal to drive with a BAC at or above a specified limit (Goodwin et al., 2015). Per se limits are designed to serve as a general deterrent against alcohol-impaired driving (Mann et al., 2001).

Research has demonstrated that per se laws significantly reduce alcohol-impaired fatal crashes (Klein, 1989; Hingson et al., 1994; Voas et al., 2000; Mann et al., 2001; Bernat et al., 2004; Fell & Voas, 2006; Dang, 2008). Further, research has demonstrated that the effects of per se laws are due to general deterrence and the laws affect all of the drinking-driving population (Mann et al., 2000). Most jurisdictions that have implemented per se laws have seen reductions in alcohol-related crashes, injuries and fatalities (Mann et al., 2000).

Strengths. The SMEs considered that per se limits have a general deterrent effect on the population, discouraging individuals who have consumed alcohol and/or drugs from driving. Also, members of juries want to see a quantifiable number indicative of impairment, similar to that for alcohol. This is especially true in cases that lack evidence of driving behavior to explain to a jury.

Limitations. Per se limits can hinder prosecution of impaired drivers when the driver's blood toxicology results are below the per se limit despite a driver's behavior demonstrating impairment. Polysubstance use further complicates the matter, as a driver may be below per se levels but still demonstrate signs of impairment. Further, there is limited evidence to support specific per se limits for many drugs, and a lack of evidence of effectiveness for reducing drugged driving.

Additionally, each drug affects each person differently. Therapeutic levels for one person may be impairing for another; therefore, it could be quite difficult to establish a universal per se level for each substance. Also, a significant challenge when prosecuting an individual for drug-impaired driving is the need to obtain blood for toxicology testing as quickly as possible due to the rates at which the body processes different drugs.

Recommendations. Based on the effectiveness of per se limits for alcohol, the SMEs noted their potential application as a countermeasure against drug-impaired driving. SMEs cited the lack of research linking a specific level of drug in the body to impairment; however, SMEs did recognize per se limits as a valuable deterrence strategy. SMEs felt current per se laws, specifically for marijuana, are difficult to enforce and can be more detrimental than helpful in the prosecution of drug-impaired drivers. Also, SMEs spoke to the number of per se laws that would need to be established to have a per se limit for each and every impairing substance available to the public. Additional research should be conducted into the effects of specific drugs on the driving task, as well as the effects of per se limits, before evidence-based per se levels could potentially be recommended (see e.g., NHTSA, 2017; Logan et al., 2016).

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DISCUSSION

The effects of alcohol on traffic safety, and the effectiveness of related countermeasures, have been the topic of much research. In contrast, research into effective countermeasures for driving under the influence of drugs other than alcohol has progressed much more slowly. A group of SMEs was recruited in the current study to discuss the possibility of applying some of the lessons learned from alcohol to drugged driving. Although their discussion touched upon dozens of potential countermeasures, only a few were elaborated upon here and in the sister document describing behavioral and educational approaches. Those countermeasures that are elaborated upon in the two documents were clearly grounded in alcohol-related approaches and had available scholarly references to supplement the SME discussions; they were also ones with which the participating SMEs had direct experience and knowledge. Examples of countermeasures excluded from further discussion included those involving drug recognition experts (DRE) and Advanced Roadside Impaired Driving Enforcement (ARIDE) as these were already specific to detection of and enforcement against drug-impaired driving.

It is important to note that findings from the literature review did not always coincide with opinions expressed in the SME workshops, highlighting a discrepancy between research and practice. For example, in spite of evidence supporting the effectiveness of per se limits in combating alcohol-impaired driving, the SMEs recognized significant challenges in adapting this countermeasure to combat drug-impaired driving. This underscores the fact that, in spite of potential similarities between the impairing effects of alcohol and other drugs, there remain fundamental differences in how these are manifested in individuals. Thus, there are real constraints that need to be considered in terms of adapting alcohol countermeasures for drugged driving.

While every effort was made to ensure a comprehensive evaluative approach, limitations remain. This effort identified many countermeasures; however, an in-depth analysis of each countermeasure could not be conducted due to the lack of availability of scholarly resources and the lack of exposure of our SME panel members to those countermeasures. As such, the current list is not exhaustive in terms of potential countermeasures against drugged driving. Finally, additional research and scholarly sources may exist that support or oppose the use of countermeasures identified in this effort.

Based on the outcomes from this project and the supporting scientific literature, it is important to underscore that many of the countermeasures discussed are most effective when used in combination. For example, enforcement activities garner better outcomes when used in conjunction with media publicity (e.g., Goodwin et al., 2015). Specific guidance is provided in the sections above; however, this is not exhaustive. Thus, advocates, legal and safety professionals, and legislators are urged to consider a broad array of approaches in addressing the issue of drug-impaired driving. Lastly, it is important and recommended to evaluate the effectiveness of the countermeasure — whatever form it takes — as this will inform other states and jurisdictions and will guide future improvements to programs.

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Research Brief

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