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DUID prevalence in Colorado's DUI citations

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ABSTRACT

Introduction: There are limited studies that measure the prevalence of driving under the influence of drugs (DUID) based upon impairment measures because most prevalence studies are based on drug tests. The aim of this study was to provide the first estimate of DUID prevalence in Colorado using data collected by Colorado law enforcement officers in vehicular homicide (VH) and vehicular assault (VA) cases, and reported in court records. *Methods:* The four research questions of this study were answered by completing independent *t*-tests or Mann–Whitney *U* tests, Pearson chi-square analyses or Fisher's exact tests, and Kruskal–Wallis tests. *Results:* Seventy percent (119 out of 170) of the cases involved alcohol only and 30% (51 out of 170) involved drugs. Of the latter cases, 32 cases involved a combination of alcohol and drugs and 19 cases identified drugs only, with no alcohol. Marijuana was the most commonly cited drug (23 cases); however, it was the sole impairing substance identified in only three cases. *Conclusion:* Polydrug use was very common among DUID cases, which makes it difficult to identify which drug or drugs caused the impairment responsible for the Driving Under the Influence citation. This study revealed tha (a) drugged driving is a frequent cause of DUI citations in cases charged with VH or VA; (b) that polydrug use, rather than marijuana, is the most common cause of drugged driving in Colorado; and (c) that current warrant procedures render blood test results meaningless in cases of marijuana-impairment. *Practical application:* States should collect and analyze DUID data to ensure legislators focus on the right DUID problems to improve biological testing for drugs, adopt more appropriate roadside testing, and enact stronger DUID laws to protect the public.

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1. Introduction

Within the last decade, driving under the influence of drugs (DUID) has been identified as a significant public safety concern by leading local and national organizations (Colorado Task Force on Drunk and Impaired Driving, 2014; Governors Highway Safety Association, 2014; Office of National Drug Control Policy, 2011) This concern is supported by abundant evidence of the impairing power of a myriad of illicit drugs, licensed pharmaceuticals used recreationally, as well as medicines taken as prescribed. The National Highway Traffic Safety Administration (NHTSA) published fact sheets on the impairing effects of a range of drugs from cannabis to Zolpidem (Couper & Logan, 2014). The psychomotor impairing effects of opioids have been extensively documented revealing striking tolerance differences between naïve users and those habituated to the drugs (Stout & Farrell, 2002). Logan (2002) summarized studies of methamphetamine and other amphetamines, noting that low therapeutic doses may be safe for driving, but higher doses that are typical in abuse situations are both impairing and unpredictable, especially when used in combination with other drugs.

Cannabis impairment has been studied and reported extensively. A small experimental study in the Netherlands gave participants one of three varying doses of THC (0, 100, and 200 μg/kg) with or without alcohol. The researchers discovered that driving performance was worse with higher levels of THC and in the alcohol and THC combinations. In addition, participants self-reported stronger intoxication ratings in the THC and alcohol combination groups (Ramaekers, Robbe, & O'Hanlon, 2000). A roadside study in Norway of 4963 drivers impaired by alcohol, THC, or a combination of both revealed that alcohol and THC in combination are more impairing than either separately (Bramness, Khiabani, & Morland, 2010). Hartman and Huestis (2013) reported that evaluations of the impairing effects of cannabis are complicated by such factors as delays in sample collection, testing of the drug's inactive metabolite, and polydrug use. Nevertheless, after a careful systematic study of the literature, the authors reported that "recent smoking [of cannabis] and/or blood concentrations of 2-5 ng/ml of Δ^9THC are associated with substantial driving impairment, particularly in occasional smokers."

The evidence that many drugs impair drivers is plentiful and convincing. Yet determining the prevalence and consequences of DUID has proven to be more problematic. Laboratory tests can be used to determine the presence of impairing drugs in drivers. For example, the Fatality Analysis Reporting System (FARS) compiles data on drivers

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in fatal crashes, including laboratory tests, primarily from coroners (National Highway Traffic Safety Administration [NHTSA], 2015). NHTSA (2010) reported that in 2009, 33% of fatally injured drivers with known drug test results tested positive for drugs. Brady and Li (2014) reported that the prevalence of non-alcohol drugs in fatal crashes was 28.3% in 2010.

Researchers have used the FARS data set because FARS has documented fatalities from motor-vehicle crashes occurring within the 50 United States, the District of Columbia, and Puerto Rico since 1975. Recent studies using the FARS data have demonstrated a poor or mixed association between various drugs and fatal crashes (Anderson & Rees, 2012; Romano, Torres-Saavedra, & Voas, 2014). However, FARS provides too few data entry fields to capture the scope of polydrug abuse and does not distinguish between impairing drugs and some inactive metabolites, such as marijuana's 11-nor 9 carboxy tetrahydrocannabinol (THC-COOH). It captures drug data on drivers irrespective of their culpability in causing a crash; some are victims of culpable drivers. Reporting in most states is voluntary and variable. NHTSA recognizes some of these limitations of FARS and also pointed out that the mere presence of drugs does not necessarily mean impairment, cautioning users of the FARS data against inferring DUID trends or prevalence from the database (Berning & Smither, 2014a).

Roadside voluntary drug tests have been used to show changes in prevalence over time, but they also fail to distinguish between drug presence and drug impairment. NHTSA reported that 22.5% of weekend nighttime drivers tested positive for drugs in the 2013–2014 National Roadside Survey (Berning, Compton, & Wochinger, 2014b).

This study takes a different approach to measuring the prevalence of DUID, based upon impairment measures, rather than laboratory measures. Data for the study were collected from driving under the influence (DUI) assessments made by Colorado law enforcement officers, and recorded in court records.

Although laboratory tests alone will suffice to support a charge of DUI per se, officers must observe and document signs of impairment to charge a driver with DUI. Colorado has a single DUI offense for driving under the influence of alcohol, drugs, or a combination of alcohol and drugs. If evidence supports a charge of driving under the influence of alcohol, officers in Colorado need make no effort to collect evidence in support of DUID because the statute does not provide for a separate DUID charge.

Colorado typically has 25,000 DUI cases per year (Colorado Department of Transportation, 2013). Since Colorado has no separate charge for DUID, the state does not record how many of those DUI cases are actually DUID cases, even though DUID evidence may remain in police reports and court records. Therefore, the aim of this study is to provide the first estimate of DUID prevalence in Colorado's DUI cases. This estimate may be understated due to the difficulty in collecting evidence for DUID and because the current statute does not require such evidence, if evidence is already collected for alcohol impairment. Specifically, this study endeavored to answer the following questions:

1. Which impairing substances cause DUI in Colorado cases of vehicular homicide/DUI and vehicular assault/DUI?
2. What is the prevalence of DUI and DUID convictions?
3. Are there conviction differences between single vehicle crashes and multiple vehicle crashes?
4. Did a change occur in the amount of time required to collect a blood sample as a result of Missouri vs. McNeely or warrant vs. no warrant?

2. Methods

2.1. Study design

This study was designed to estimate the prevalence of DUID in Colorado's DUI citations by studying drivers shown to be culpable of causing death or serious bodily injuries. This study is unique in that it studies drug impairment, not merely drug presence in drivers. It only reviewed cases where evidence allowed law enforcement officers to charge the suspects with DUI. Also unique, the study followed the cases through to judicial outcome and was able to determine the impact of the Supreme Court's ruling in Missouri vs. McNeely that law enforcement officers may, in some cases, require a warrant to collect blood in suspected DUI cases.

2.2. Data sources

The Colorado State Judicial Branch provided, upon request, a spreadsheet of all charges against, and judicial outcomes of, defendants in Colorado in 2013 who were charged with either vehicular homicide (VH) or vehicular assault (VA), and where the cases had been adjudicated by October 1, 2014.

Court records were studied for each of the DUI cases using the best means available. The redacted case file was read at the respective district courthouse, if permitted and available. Some district courts do not permit viewing the entire file but permit a researcher to purchase specifically identified and redacted documents from the file. Some files were not available on the dates of visits to courthouses, so copies of specifically identified and redacted documents were requested by phone, mail, FAX, or e-mail, depending upon the unique requirements of each district court.

Each case was studied for written evidence of the cause of the DUI charge. Based upon evidence from court files, each case was given one of the following classifications: (a) DUI-A, alcohol was the only impairing substance identified; (b) DUI-D, single or multiple drugs (other than alcohol) identified; and (c) DUI-A + D, both alcohol and one or more drugs identified. Other variables taken from the case files and used in the analyses: drugs found at the scene of the crash; top charge finding (coded 0–1); single or multivehicle crash (coded 0–1); needed warrant for blood draw (coded 0–1); pre/post McNeely Law (coded 0–1); delay in minutes of blood draw; guilty of a DUI (coded 0–1); age; and gender (coded 0–1).

There were 1263 charges made against 229 defendants, 181 who were also charged with DUI. Seven cases were eliminated from further consideration, reducing the pool of all VH/VA defendants to 222 and the DUI subset of cases to 174. One deleted case was of a juvenile offender whose record was sealed during analysis. Six other cases were eliminated because they were not vehicular homicide or assault cases. Instead, a vehicular assault charge due to DUI was added to these cases as part of a plea bargain of a more serious charge such as robbery or aggravated assault. These six cases did not involve vehicles and intoxication. The deletions resulted in 174 VA/VH–DUI cases to evaluate (147 VA-DUI cases and 27 VH-DUI cases). The 48 non-DUI cases were not further studied.

2.3. Statistical analyses

Data were edited and analyzed in SAS®, 9.4. Descriptive analyses were completed to examine the prevalence and frequency of drugs found at the scene of the crash and on the type of DUI cases (A, D, or A + D). To answer the four research questions, independent *t*-tests or Mann–Whitney *U* tests (non-parametric independent *t*-tests), Pearson chi-square analyses or Fisher's exact tests, and Kruskal–Wallis tests (non-parametric one-way ANOVAs) were completed depending on the independent and dependent variables of the specific questions. In addition, age and sex were examined as possible covariates and, if related, were included in the model. Alpha levels of 0.05 and two-sided tests were used to determine significance.

3. Results

Of the 170 cases where the impairing substance was identified as either alcohol or drugs, 119 (70.0%) of the cases involved alcohol only

and 51 (30.0%) involved drugs. Of the 51 cases involving drugs, 32 (18.8% of the total) involved a combination of alcohol and drugs, whereas 19 (11.2%) cases identified drugs only, with no alcohol.

Overall, DUI-A defendants are slightly more likely to be found guilty of a DUI (91.6%), followed by DUI-A + D defendants (84.4%) with DUID defendants being the least likely (78.9%); however, this difference was not statistically significant (see Table 1). There were no differences between males, females, and age on convictions for a DUI.

There were no statistically significant differences between DUI classification and convictions for VH-DUI or VA-DUI (see Table 2). However, DUI-A defendants were more likely to be found guilty (60.5%), followed by DUI-A + D defendants (50%) with DUI-D defendants being the least likely (42.1%). There were no differences between males, females, and age on convictions for a VH-DUI or VA-DUI.

Overall, defendants involved in single vehicle crashes were slightly more likely to be convicted of a DUI (92.3%) compared to defendants in multivehicle crashes (86.3%); however, this difference was not statistically significant ($\chi^2 = 1.18$, $p = 0.2774$). The proportions of single and multivehicle crashes that were convicted of VH-DUI or VA-DUI were evenly split (53.9% vs. 52.6%, respectively; $\chi^2 = 0.0001$, $p = 0.9924$). Again, there were no differences between sex and age.

There was an average of a five-and-a-half-minute increase in time to take a blood sample after the Missouri vs. McNeely Supreme Court decision, which was not significant. There were no differences between sex and age on time required to collect blood. There was a significantly greater time required to collect blood when a warrant was required (229.6 min vs. 133.6 min); however, only 5 cases required a warrant to collect blood. Table 3 compares the impact of Missouri vs. McNeely and requiring a warrant on the time required to collect a blood sample.

Table 4 reveals the extent of polydrug use in alcohol only, alcohol and drug, and drug-only cases by displaying the cases by the type and number of alcohol and drug impairments instead of by DUI-A, DUI-A + D, and DUI-D. Although marijuana was the most commonly cited drug (23 cases), it was the sole impairing substance identified in only three cases. However, after alcohol, the combination of alcohol and marijuana was the second most prevalent cause of DUI citations. After those two sub-classifications, polydrug use complicates the description of leading causes of DUI, as shown in Table 4. Multiple drugs that were used included two to four of the following drugs in various combinations and in the following order of frequency: marijuana, methamphetamine, cocaine, opiates/opioids, and benzodiazepines, with no combination occurring more than twice.

4. Discussion

4.1. Focus on the right problem and collect the data

Given marijuana's commercialization and legalization, Colorado's legislature and others have focused upon the question of marijuana-impaired driving, to the exclusion of a focus on the broader issue of drugged driving. This study revealed that marijuana was the most commonly cited drug because it was involved in 23 cases; however, 16 of these cases also involved alcohol and in only 3 cases was marijuana the sole impairing substance identified. Even though research has found that the proportion of marijuana-positive drivers in fatal motor-vehicle crashes is increasing in Colorado, it is imperative not to lose sight of DUI cases involving polydrug use (Salomonsen-Sautel, Min, Sakai, Thurstone, & Hopfer, 2014). Among the drug-only cases, where drugs were identified, half of the cases consisted of drivers who used more than one drug. Polydrug use makes it difficult to identify which drug or drugs caused the impairment responsible for the DUI citation. The data from this study make it abundantly clear that a focus on marijuana alone can miss the larger problem of drugged driving in VH and VA cases, of which marijuana is an important component but a component within the larger framework of DUIDs.

Policy makers should consider all causes of DUID and act responsibly based upon the data that result from these measures. A good start would be to amend Colorado's statute that provides only a single citation number for DUI irrespective of the cause of the impairment. One-half of the states already have separate citation numbers for DUI alcohol and DUID, enabling them to measure DUID separately. Colorado should follow their lead, and then fund a program to analyze and publish DUID data for use by policy makers and researchers. Importantly, these additions will provide evidence upon which future policy decisions can be made.

4.2. Improve biological testing for drugs

Time taken to confirm probable cause prior to taking a blood sample can delay blood sample collection. To avoid this problem, some states have determined that involvement in a crash that results in death or serious bodily injury is sufficient probable cause to take a blood sample. This approach is an extension of the current expressed consent law. This study provides data to support that approach because 79% of VH and VA defendants were also charged with DUI.

Table 1
Convictions for DUI.

DUI classification	Not guilty of DUI *n* (%) *n* = 19	Guilty of DUI *n* (%) *n* = 151	Fisher's exact test, *p*
A	10 (8.4%)	109 (91.6%)	
A + D	5 (15.6%)	27 (84.4%)	
D	4 (21.1%)	15 (78.9%)	0.1501

Table 2
Convictions for VH-DUI or VA-DUI.

DUI classification	Pled down or dismissed *n* (%) *n* = 72	Guilty of VH-DUI or VA-DUI *n* (%) *n* = 96	Not guilty*	χ^2	*p*
A	47 (39.5%)	72 (60.5%)			
A + D	15 (46.9%)	16 (50.0%)	1 (3.1)		
D	10 (52.6%)	8 (42.1%)	1 (5.3)	2.12	0.3462

* Not included in the Pearson chi-square analysis.

Table 3
Impact of McNeely and warrants on blood collection time.

Group	$\overline{X}$ (SD) minutes	*t*	*p*	Average time to collect blood
Before McNeely (*n* = 24)	138.8 (68. 6)			2.3 h
After McNeely (*n* = 33)	144.3 (82.8)	−0.27	0.7883	2.4 h
Consensual blood draws (*n* = 52)	133.6 (70.7)			2.2 h
Blood draws requiring warrants (*n* = 5)	229.6 (88.3)	−2.85	0.0062	3.8 h

Table 4
Causes of DUI.

Cause	Number	%
Alcohol	119	70.0%
Alcohol + marijuana	14	8.2%
Multiple drugs	8	4.7%
Alcohol + methamphetamine	5	2.9%
Alcohol + multiple drugs	3	1.8%
Marijuana	3	1.8%
Other drugs (meth, opiates, benzo or other)	6	3.5%
Alcohol + other drugs (opiates, cocaine, benzo or other)	6	3.5%
Drugs not identified	6	3.5%

This study reveals that traditional warrants can add an average of 1½ h to the normal 2 h required to collect a blood sample in cases of death or serious bodily injury. Ninety percent of marijuana's THC is cleared from the blood within the first hour after smoking, making blood test results for THC irrelevant after such a delay (Huestis, Henningfield, & Cone, 1992). Hartman, Brown, Milavetz, Spurgin, Gorelick et al. (2015b) reported that 78.9% of occasional to moderate cannabis smokers had blood THC levels below 5 ng/ml after 2.3 h, which is the average time for blood draws in this study. Some jurisdictions in Wyoming and Arizona, for example, deal with warrant delays by implementing an electronic warrant system that reduces delays to under one-half hour.

Even without delays in blood sampling caused by the need for warrants, the logistics involved with blood sampling (2.3 h on average in this study) show that blood testing is of limited use to confirm THC from smoked marijuana. Adoption of a rapid roadside testing using oral fluids and sampling of oral fluid for subsequent laboratory testing to augment or even replace blood testing would be a better solution to test for THC (Bosker et al., 2012). Therefore, adoption of this system should be accelerated in Colorado.

4.3. Strengthen DUID laws

The following sections will draw upon results based on this study and other studies to show that DUI laws effectively deal with a world where alcohol is the only commonly used impairing substance; however, DUI laws are less effective in dealing with drugged driving, as indicated by the lower conviction rates for DUID compared with DUI observed in this study. This finding should not be too surprising because drugs are unlike alcohol chemically, biologically, and metabolically. Furthermore, drugs differ among themselves and the effects of drug and alcohol combinations are different from the effects of alcohol alone.

4.4. DUI definition

Definitions of "under the influence" vary by state, ranging from "if the person is impaired to the slighted degree, (Arizona 23-1381(A.)(1.))" to "a degree that renders the person incapable of safely driving a vehicle (New Mexico 66-8-1 (B.))." Recognizing that legal proof of the former is easier than legal proof of the latter, Vermont recently established the former definition for DUID, keeping the latter definition for DUI alcohol (Vermont 23–13-1201 (h)).

Two tools commonly used to prove DUI alcohol impairment are problematic when applied to DUID: DUI per se laws and Standardized Field Sobriety Tests (SFSTs).

4.5. DUI per se laws

The difficulty of proving that symptoms of impairment were caused by alcohol consumption led to the adoption of alcohol DUI per se laws, which find a defendant guilty of DUI per se based upon biological tests, rather than upon behavioral symptoms.

There is no blood level of THC (or any other drug) above which everyone is impaired, and below which, no one is impaired (Reisfield, Goldberger, Gold, & DuPont, 2012). The same is true with alcohol (Paton, 2005); however, the range of sensitivities to concentration levels is much wider for many drugs than it is for alcohol. Setting a per se level low enough to provide public safety can convict non-impaired drug users who have developed a tolerance for some of the impairing effects of drugs.

Establishing a strong correlation between various blood concentrations of drugs and driving impairment has proven to be far more difficult than it has been for alcohol (Reisfield et al., 2012). Nevertheless, three states have established drug per se limits for select panels of drugs: Nevada, Ohio, and Virginia. Lacking robust impairment correlation studies, these per se limits were set close to laboratory detection limits since the intent was to protect public safety. Of these states, only Nevada and Ohio have THC per se limits, both at 2 ng/ml in whole blood.

A different approach was taken by Washington and Montana that have 5 ng/ml of whole blood per se limits for THC, and by Colorado with its 5 ng/ml permissible inference level. These states do not set per se limits or permissible inference levels for other drugs. Colorado's 5 ng/ml level was established as a compromise between the lower level suggested by toxicologists to serve the interests of public safety and the higher level requested by marijuana advocates (Commission on Criminal and Juvenile Justice, 2011). Laboratories confirm that the majority of cannabinoid-positive drivers arrested on suspicion of driving under the influence of marijuana test below 5 ng/ml, suggesting the level used by these three states is set too high to ensure public safety (Logan, 2015). This is to be expected since blood tests do not reflect THC concentrations at the time of the observed infraction (Wood, Brooks-Russell, & Drum, 2016). The 5 ng/ml limit has been criticized by others as too strict, with claims that some people can drive safely at THC blood levels higher than 5 ng/ml.

A more common approach to establishing drug per se levels are "zero tolerance" laws established by 15 states, following the lead of the U.S. Department of Transportation (DOT) regulations for commercial drivers. The DOT and these states typically avoid the issue of correlating drug levels with impairment by restricting the zero tolerance laws to illegal drugs or legal drugs taken illegally.

Law enforcement officers must establish probable cause that a driver was operating under the influence before a blood sample can be taken to test for drugs. Nevertheless, critics of "zero tolerance" laws claim they are too intrusive and needlessly restrict personal behavior since the state has not provided proof that detectable levels of cited drugs pose a danger to others.

Lacking studies showing a strong correlation between drug blood levels and impairment similar to those available for alcohol impairment, states must rely upon zero tolerance laws, perhaps combined with a requirement that behavioral impairment be documented, as is done in New Zealand:

> It is an offence to drive while impaired and with evidence in the bloodstream of a qualifying drug. The presence of a qualifying drug alone is not sufficient for an offence; there must first be impairment as demonstrated by unsatisfactory performance of the compulsory impairment test (New Zealand Ministry of Transport, 2009).

4.6. SFSTs

The Standardized Field Sobriety Tests are administered at the roadside to establish validated indicators of impairment. SFST has been validated to accurately confirm alcohol impairment. A 1981 study showed an 81% confirmation of .10 BAC, and a 1998 study revealed a 91% confirmation of .08 BAC (National Highway Traffic Safety Administration, 2001). However, both a 2006 and a 2011 study demonstrated that SFSTs were only moderately successful in identifying marijuana-impaired drivers (66–76%; Bosker et al., 2012; Papafotiou, Carter, & Stough, 2005). It appears that a version of the SFSTs that more reliably identifies drug impairment is needed.

4.7. Polydrug impairment

Studies by Ronen et al. (2010) and Downey et al. (2013) confirm the impairing effects of alcohol combined with marijuana. Their studies examined the effects of alcohol, marijuana, and the combination of alcohol and marijuana on driving tasks and found that the combination of alcohol and marijuana had the most intense effect on performance impairments on driving tasks. Hartman, Brown, Milavetz, Spurgin, Pierce et al. (2015a) recently demonstrated that impairing effects of alcohol

and cannabis were additive, finding that measures of standard deviation of lane position for drivers with blood THC concentrations of 5 ng/ml plus alcohol breath concentrations of .05 g/210 L were similar to drivers with alcohol breath concentrations of .08 g/210 L, the per se standard in the United States. Importantly, Hartman, Brown, Milavetz, Spurgin, Pierce et al. (2015a) reported blood THC concentrations at the same time as the impairment measure, rather than hours later, as is the norm with forensic cases.

Recognizing that current DUI laws do not recognize the dangers posed by alcohol plus marijuana, Larkin (2015) has proposed that alcohol per se levels be reduced to .05 g/dl for everyone who is a medical marijuana patient, or even across the board. Another option is for states legalizing marijuana to consider reducing alcohol per se levels to .05 g/dl or lower for drivers with any measurable level of THC in their blood. Currently, Colorado presumes a driver with a blood level below .05 g/dl is not impaired by alcohol, regardless of the presence of other impairing substances.

An alternative approach to strengthening DUI laws would be to enhance penalties for driving under the influence of combinations of drugs or drugs plus alcohol. NHTSA has recommended that "State statutes should be amended to provide separate and distinct sanctions for alcohol- and drug-impaired driving that could be applied individually or in combination to a single case. This would provide an incentive for law enforcement officers to pursue a possible drug-impaired driving charge even when a BAC equal to or above the limit of .08 g/dl has already been established" (Compton, Vegega, & Smither, 2009).

5. Limitations

This report may be the first statewide estimate of the prevalence of DUIDs issued in Colorado and as such provides beneficial information. However, before comparing these results with those from recent publications (Colorado Task Force on Drunk and Impaired Driving, 2014; Rocky Mountain High Intensity Drug Trafficking Area, 2015; Salomonsen-Sautel et al., 2014) it is important to understand the limitations of this study.

First, the characteristics of DUI defendants who are also vehicular homicide and/or vehicular assault defendants may not be the same as DUI defendants in general. DUI defendants arrested based on observations of their driving behavior may exhibit a different alcohol/drug profile than defendants arrested on the basis of having caused death or serious bodily injury in a traffic collision.

Second, the detail contained in court records is highly variable from one district to another and from case to case. In all cases, the court records tell only part of the story. If no information identifying the cause of the DUI citation was found in the record, the DUI was classified as DUI-A by default. This may or may not have been an accurate classification.

Third, DUID classifications may be underreported for several reasons, including (a) if a driver can be shown to be impaired by alcohol, a law enforcement officer has no incentive to search for other impairing substances, since it would not result in an additional charge. The initial cost of drug testing, if done, would be borne by the law enforcement agency, discouraging further investigation. (b) Suspected alcohol impairment can be confirmed at the roadside using a Breathalyzer, and confirmed for evidentiary purposes quickly using a calibrated Breathalyzer at the station house. Testing of drug presence in drivers is not yet done at the roadside in Colorado, although devices to enable this are currently being evaluated by the Colorado State Patrol. Laboratory drug confirmation results are not available until days or even weeks after the defendant has been charged. (c) Few law enforcement officers are trained to recognize drugged driving. Colorado has approximately 13,000 active graduates of Peace Officer Standardized Training who have been trained to recognize, document, and testify to alcohol impairment. As of March 2015, there were 207 active Drug Recognition Experts (DRE) trained to recognize, document, and testify to drug impairment. ARIDE-trained officers (Advanced Roadside Impaired Driving Enforcement) can identify and document drug impairment. Because their training is more limited than that of a DRE, an ARIDE court testimony may carry less weight than that of a DRE. Colorado trained 550 officers in ARIDE in 2014, the first year that state records of ARIDE training were maintained. (d) The most commonly cited initial indications for impairment that are observed by and noted by law enforcement officers are the odor of alcohol and bloodshot and watery eyes. Drugs present no odor, except for recently smoked marijuana. The pinkish eyes resulting from recent marijuana user are less prevalent than they are for drunk drivers. Stumbling, slurred speech, and other physical traits consistent with being drunk often do not exist with drug impairment, which affects more mental properties than physical properties. (e) Whereas alcohol laboratory testing is standardized, drug testing is not and likely cannot be standardized because of constantly increasing number of impairing substances that are now being used by drivers.

6. Conclusion

This study found that 70% of the DUI vehicular homicide or vehicular assault cases involved alcohol only and 30% involved drugs. Of the latter 51 cases, involving drugs, 32 involved a combination of alcohol and drugs, whereas 19 cases identified drugs only, with no alcohol. Marijuana was the most commonly cited drug at 43.8%; however, it was the sole impairing substance identified in only three cases. It is imperative that states like Colorado collect the necessary DUID data to ensure they focus on the right DUID problems to improve biological testing for drugs, adopt more appropriate roadside testing, and enact stronger DUID laws to protect the public.

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