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Per se drugged driving laws and traffic fatalities

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ABSTRACT

In an effort to reduce drugged driving by 10%, the Office of National Drug Control Policy is encouraging all states to adopt per se drugged driving laws, which make it illegal to operate a motor vehicle with a controlled substance in the system. To date, 20 states have passed per se drugged driving laws, yet little is known about their effectiveness. Using data from the Fatality Analysis Reporting System for the period 1990–2010, the current study examines the relationship between these laws and traffic fatalities, the leading cause of death among Americans ages 5 through 34. Our results provide no evidence that per se drugged driving laws reduce traffic fatalities.

1. Introduction

Arizona was the first state to pass a per se drugged driving law. As of June 28, 1990 it became illegal to operate a motor vehicle in Arizona with detectable levels of cocaine, marijuana, methamphetamine, phencyclidine (i.e., PCP) or any other controlled substance in the system. Arizona drivers who test positive for a controlled substance are presumed to be impaired and can be prosecuted without additional evidence.

Over the next two decades, 12 more states passed zero tolerance per se drugged driving laws, and 4 states passed laws specifying nonzero thresholds for controlled substances (or their metabolites) above which a driver is automatically considered impaired (Table 1). Nevada, Ohio, and Pennsylvania specify nonzero thresholds for marijuana and a variety of other controlled substances. Virginia specifies nonzero thresholds for cocaine, methamphetamine and phencyclidine, but does not specify thresholds for marijuana or tetrahydrocannabinol, the primary psychoactive agent in marijuana[1].

Drugged driving is often characterized as a serious and growing threat to public safety (Leinwand, 2004; Walsh and DuPont, 2007; Westall, 2010; Freeman and DyBuncio, 2011; DuPont et al., 2012). Indeed, according to data from the 2010 National Survey on Drug Use and Health, 10.6 million Americans reported driving under the influence of an illicit drug in the past year; in comparison, 28.8 million Americans reported driving under the influence of alcohol (Substance Abuse and Mental Health Services Administration, 2011). According to Compton and Berning (2009), who analyzed data from the 2007 National Roadside Survey, more than 15% of drivers on weekend nights test positive for drugs.

In 2010, the Office of National Drug Control Policy (ONDCP) announced a goal of reducing drugged driving in the Unites States by 10% within five years (ONDCP, 2010). In an effort to achieve this goal, the director of the ONDCP has repeatedly urged states to pass per se drugged driving laws (Kerlikowske, 2012; ONDCP, 2012; Botticelli, 2014). The Governors Highway Safety Association (GHSA) and Mothers Against Drunk Driving (MADD) have also expressed strong support for per se drugged driving laws[2]. However, aside from anecdotal evidence that these laws make drugged driving eas-

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[1] More information on per se drugged driving laws is available from Lacey et al. (2010), Armentano (2013) and the National Alliance for Model State Drug Laws (2014). Since 2010, Montana, Oklahoma, and Washington have enacted per se drugged driving laws. In 2013, the Colorado legislature passed HB 1325, under which having 5 or more nanograms of THC per milliliter of blood gives rise to the "permissible inference" of driving while impaired (Ferner, 2013a; Ingold, 2013). Kentucky, Minnesota, and North Carolina are included among the 13 states that passed a zero-tolerance per se drugged driving law between 1990 and 2010, but the per se laws in these states exempt marijuana (Cordova, 2007; National Alliance for Model State Drug Laws, 2014).

[2] On its website, the GHSA argues that reducing drug-impaired driving should be a "national priority" and encourages states to "adopt drug per se (zero tolerance) drug impairment laws." In 2011 Kerlikowske and the President of MADD, Jan Withers, announced a new partnership to raise public awareness regarding the consequences of drugged driving. Kerlikowske was quoted as saying:
Research shows that drugs have adverse effects on judgment, reaction time, and motor skills—all vital requirements for responsible driving. . .I can think of no greater organization with which to partner to save lives on our roadways than MADD. For decades, MADD has been a lynchpin in our Nation's efforts to make our roadways safer and I am proud to join them to help raise public awareness regarding the devastating consequences of drugged driving (ONDCP, 2011a).

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Table 1
Per se drugged driving laws, 1990–2010.

	Effective date
Arizona	June 28, 1990
Delaware	July 10, 2007
Georgia	July 1, 2001
Illinois	August 15, 1997
Indiana	July 1, 2001
Iowa	July 1, 1998
Kentucky	July 15, 2010
Michigan	September 30, 2003
Minnesota	August 1, 2006
Nevada	September 23, 2003
North Carolina	December 1, 2006
Ohio	August 17, 2006
Pennsylvania	February 1, 2004
Rhode Island	July 1, 2006
Utah	May 2, 1994
Virginia	July 1, 2005
Wisconsin	December 19, 2003

Notes: Information on per se drugged driving laws is available from Lacey et al. (2010), Armentano (2013), and the National Alliance for Model State Drug Laws (2014). Since 2010, Montana, Oklahoma, and Washington have enacted per se drugged driving laws. In 2013, the Colorado legislature passed HB 1325, under which having 5 or more nanograms of THC per milliliter of blood gives rise to the "permissible inference" of driving while impaired (Ferner, 2013a; Ingold, 2013).

ier to prosecute (Lacey et al., 2010, p. 5), next to nothing is known about their effectiveness (Walsh et al., 2004).

Using data from the Fatality Analysis Reporting System (FARS) for the period 1990–2010, the current study examines the relationship between per se drugged driving laws (hereafter referred to as "per se laws") and traffic fatalities. Estimates of this relationship are positive, but imprecise. Because of this imprecision, we cannot rule out the possibility that, as currently implemented, per se laws reduce traffic fatalities.

2. Background

2.1. Substance use and driving

Alcohol impairs driving-related functions such as concentration, hand-eye coordination, and reaction time (Kelly et al., 2004; Sewell et al., 2009). Not surprisingly, simulator, driving-course, and etiological studies, which are typically based on police crash and medical examiner reports, provide strong evidence that alcohol consumption leads to an increased risk of collision (Kelly et al., 2004; Sewell et al., 2009). Drivers under the influence of alcohol tend to underestimate the degree to which they are impaired (MacDonald et al., 2008; Marczinski et al., 2008; Robbe and O'Hanlon, 1993; Sewell et al., 2009), drive faster, and take unnecessary risks (Burian et al., 2002; Ronen et al., 2008; Sewell et al., 2009).

Laboratory studies have shown that, like alcohol, tetrahydrocannabinol (THC) impairs driving-related functions (Kelly et al., 2004; Sewell et al., 2009). However, simulator and driving-course studies provide little evidence that marijuana use leads to an increased risk of collision (Kelly et al., 2004; Sewell et al., 2009) perhaps because drivers under the influence of marijuana tend to overestimate the degree to which they are impaired (Kelly et al., 2004; Sewell et al., 2009)[3]. Although a number of etiological studies have shown a positive association between marijuana use and the risk of collision, they have been described as "fraught with methodological problems" (Sewell et al., 2009, p. 189). More than 10% of U.S. drivers killed in traffic accidents test positive for cannabinols (Brady and Li, 2013), but it is exceedingly difficult to account for the influence of other, difficult-to-observe factors potentially correlated with marijuana. Such factors could include, but are certainly not limited to, personality and an individual's attitude toward risk[4].

If the relationship between marijuana use and the risk of collision is entirely spurious, per se laws could still be related to traffic fatalities through the use of other drugs. Nine percent of U.S. drivers killed in traffic accidents test positive for stimulants and 6% test positive for narcotics (Brady and Li, 2013). Despite the fact that these drugs are used by a non-trivial fraction of drivers in the Unites States, very little is known about their impact on road safety (Kelly et al., 2004). Only a handful of etiological studies in this area have examined substances other than alcohol and marijuana, and even fewer simulator or driving course studies have been conducted[5]. However, the consensus opinion among experts appears to be that, in high doses, most drugs are "likely to increase accident risk" (Kelly et al., 2004, p. 332).

2.2. Per se laws and traffic fatalities

Currently, all 50 states prohibit driving a motor vehicle with a blood alcohol concentration (BAC) of 0.08 or greater. Drivers found to have a BAC greater than 0.08 are presumed to be impaired and can be prosecuted without having to introduce additional evidence. In contrast, most states do not set specific thresholds for controlled substances. As a consequence, in order to prove impairment, the prosecution must rely on the results of a field sobriety test or evidence that the motorist was driving erratically.

Per se laws are intended to make the job of prosecuting drugged drivers easier. Supporters claim these laws deter drugged driving and, as a consequence, improve roadway safety (Dupont, 2004; Walsh and DuPont, 2007; DuPont et al., 2012; Wood, 2013)[6]. However, because urine or blood samples must be obtained in order to determine the presence of a controlled substance in the system, and because probable cause is typically required in order to obtain toxicological evidence, it has been argued that per se laws are not a "panacea" (Walsh et al., 2004, p. 251)[7]. Moreover, the passage of a per se law does not guarantee public awareness. Becker's

[3] According to Sewell et al. (2009), (p. 186):
Many investigators have suggested that the reason why marijuana does not result in an increased crash rate in laboratory tests despite demonstrable neurophysiologic impairments is that, unlike drivers under the influence of alcohol, who tend to underestimate their degree of impairment, marijuana users tend to *overestimate* their impairment, and consequently employ compensatory strategies.

[4] A recent meta-analysis concluded that acute cannabis consumption nearly doubled the risk "of being involved in a motor vehicle collision resulting in serious injury or death" (Asbridge et al., 2012, p. 4). However, the authors of this study noted that: Although we restricted positive cannabis results to drivers that showed the presence of tetrahydrocannabinol in the absence of other drugs or alcohol, other potentially important confounders were probably not controlled for. These hidden confounders, as well as the differing study designs used, might have affected the results of the individual studies and hence the estimates of the pooled odds ratios (pp. 4–5).

[5] Driving course and simulator studies have found evidence of benzodiazepine-induced impairment in driving performance (Kelly et al., 2004), but, to our knowledge, no simulator or driving course study has examined the impact of opioids or stimulants.

[6] For instance, in a letter to *The Washington Post*, Walsh and DuPont (2007) encouraged states to pass per se laws to combat "the epidemic of drugged driving." They went on to describe "prosecutors who are restricted by antiquated laws. . .and parents whose innocent children have been injured or killed" because of government inaction. California State Senator Lou Correa, who recently introduced a zero-tolerance drugged driving bill, is quoted on his website (http://sd34.senate.ca.gov/) as saying:
Driving under the influence of illegal drugs is dangerous and cannot be tolerated. Creating a zero tolerance drugged driving policy will equip law enforcement with the tools needed to keep our communities and roads safe. . .If you have drugs in your system you should not be on the road.

[7] See also Armentano (2013), (p. 45), who argued that per se laws "may, in some instances, inadvertently criminalize behavior that poses no threat to traffic safety, such as the state-sanctioned private consumption of cannabis by adults."