

Bibliography—Zero alcohol restriction for drivers

Chad Dubeau, Research & Policy, CCSA, 2013

Carpenter, C. (2004). How do zero tolerance drunk driving laws work? *Journal of Health Economics*, 23(1), 61-83.

This paper provides the first comprehensive analysis of the effects of "Zero Tolerance" (ZT) Drunk Driving Laws—which set very low legal blood alcohol limits for individuals under age 21—on self-reported alcohol use and drunk driving using data from the 1984 to 2001 Behavioral Risk Factor Surveillance System (BRFSS). I estimate two-way fixed effects models of alcohol-related behaviors of 18-20-year-olds that can condition on unobserved differences across states that may be correlated with determinants of drinking and drunk driving, and I use 22-24-year-olds as a control group. Results indicate that the laws reduced heavy episodic drinking (five or more drinks at one sitting) among underage males by 13%. This result is supported by models that use variation in treatment intensity induced by differences in body weight. I find mixed evidence of ZT effects for females, and no robust effects on drinking participation or drunk driving for either sex. Copyright 2004, Elsevier Science BV

Carpenter, C. (2006). Did ontario's zero tolerance & graduated licensing law reduce youth drunk driving? *Journal of Policy Analysis and Management*, 25(1), 183-195.
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On April 1, 1994, Ontario, Canada, instituted a new graduated driver license (GDL) system that effectively set the legal blood alcohol content (BAC) threshold at zero for the first few years of a youth's driving eligibility. I use data from the 1983-2001 Ontario Student Drug Use Surveys (OSDUS) to examine whether the Zero Tolerance (ZT) policy reduced self-reported drinking and alcohol-involved driving among youth. I find that rates of drunk driving reported by 16- to 17-year-olds—who faced new, lower legal limits after adoption of the ZT policy—were about 5 percentage points lower after the law was implemented. Visual inspection of the data, however, shows that the estimated reduction is an artifact of a pre-existing trend: Drunk driving rates in this age group were falling steadily throughout the 1980s and into the 1990s. Estimates that account for this pre-existing trend or that consider shorter windows around the 1994 implementation date return effects on alcohol-involved driving that are either small and statistically insignificant or large and implausibly signed (positive). These null findings are robust to using the associated change in outcomes for slightly younger (14-15) or slightly older (19-20) youths as controls in a difference-in-differences framework. I similarly find no robust effect on drinking participation. This suggests that Ontario's age-targeted drunk driving law—despite being harsher than similar policies in the United States—was not responsible for reductions in Canadian youth road fatalities over the past two decades. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Chamberlain, E., & Solomon, R. (2008). Zero blood alcohol concentration limits for drivers under 21: Lessons from Canada. *Injury Prevention*, 14(2), 123-128.

Graduated licensing programs (GLPs) that include zero or low blood alcohol concentration (BAC) restrictions have proven to be a popular and effective measure for improving traffic safety among young people. However, a major drawback of such programs, at least in Canada, is that the BAC restriction is lifted on completion of the GLP, which typically occurs around the age of 18 or 19. This corresponds to the legal drinking age in Canada, a time when alcohol consumption and rates of binge drinking increase. It is not surprising, then, that 18 - 20 year-old drivers are dramatically overrepresented in alcohol-related deaths and injuries. One way to address this problem is to raise the legal drinking age, as has occurred in the United States. In jurisdictions, like Canada, that are unlikely to raise the legal drinking age, other measures are necessary to separate drinking from driving among 18 - 20 year-olds. This article recommends that the zero

BAC restrictions be extended beyond the completion of the GLP, until drivers reach the age of 21. The scientific evidence for such a measure is reviewed, and the growing government support for enacting such BAC limits in Canada is described. Copyright 2008, BMJ Publishing Group

Chang, K., Wu, C. C., & Ying, Y. H. (2012). The effectiveness of alcohol control policies on alcohol-related traffic fatalities in the united states. *Accident; Analysis and Prevention*, 45, 406-415. doi:10.1016/j.aap.2011.08.008; 10.1016/j.aap.2011.08.008

Multiple alcohol control policies have been enacted since the early 1980s to keep drunk drivers off the roads and to prevent more alcohol-related traffic fatalities. In this paper, we analyze nine traffic policies to determine the extent to which each policy contributes to effective alcohol-related fatality prevention. Compared with the existing literature, this paper addresses a more comprehensive set of traffic policies. In addition, we used a panel GLS model that holds regional effects and state-specific time effects constant to analyze their impact on alcohol-related fatalities with two distinct rates: alcohol-related traffic deaths per capita and alcohol-related traffic deaths per total traffic deaths. While per capita alcohol-related traffic deaths is used more often in other studies, alcohol-related traffic deaths per total traffic deaths better reflects the impact of policies on deterring drunk driving. In addition, regional analyses were conducted to determine the policies that are more effective in certain regions. The findings of this study suggest that zero tolerance laws and increased beer taxes are the most effective policies in reducing alcohol-related fatalities in all regions.

Constant, A., Encrenaz, G., Lafont, S., Chiron, M., Lagarde, E., & Messiah, A. (2010). Factors associated with the adoption of drinking and driving during a zero tolerance period: Results from a 6-years study in the GAZEL cohort. *Injury Prevention*, 16(Suppl 1), A230-A231.

Background While dropping Driving While Alcohol-Intoxicated (DWI) might be interpreted as a success of prevention initiatives, its adoption during a zero-tolerance period might jeopardise efforts to improve road safety. The study objectives were as follows: (1) to estimate frequencies of behaviour change regarding DWI between 2001 and 2007; and (2) to determine which factor changes that had occurred by 2001 were associated with consistent DWI adoption in the subsequent 2004–2007 period.

Method We conducted a prospective study in a large cohort of French employees and retirees (the GAZEL cohort). A Driving Behaviour and Road Safety (DBRS) questionnaire was administered three times, in 2001, 2004 and 2007.

Results The population comprised 9309 participants. In 2001, 2171 participants reported DWI while 7138 reported sober driving. More than one drink-driver out of five quitted DWI between 2001 and 2007 (n=462), while 8.2% of safe drivers adopted this behaviour (n=511). When adjusted for potential confounders, the risk of adopting DWI was associated with: increased alcohol consumption, increased number of close friend, decreased number of relatives and decreased attitudes in favour of enforcement/regulations.

Discussion The recent crackdown on road violations taken by French government in 2002 has deterred a substantial part of offenders to continue DWI, but this success was compromised by the occurrence of new drink drivers. Preventive strategies should aim at modifying factors that facilitate DWI adoption, in particular increased alcohol consumption and low acceptance of law enforcement.

Ferguson, S. A., & Williams, A. F. (2002). Awareness of zero tolerance laws in three states. *Journal of Safety Research*, 33(3), 293-299. doi:10.1016/S0022-4375(02)00027-0

The problem studied here relates to zero tolerance laws for underage drinking and driving (driving while intoxicated). A prior study indicated that zero tolerance laws differ in their enforceability and likelihood of enforcement, with California's law being easier to enforce than New York's, and New Mexico's being the hardest of all. The question is, do these differences in enforcement affect teenagers' knowledge and perception of these laws? A telephone survey was conducted to investigate awareness of the laws among 17-20 yr

olds in these 3 states and perceptions of enforcement. Results show that estimated percentages of teenagers who knew of the laws were much higher in New York and California (71% and 65%, respectively) than in New Mexico (34%). Perceptions that police were enforcing the law, that licenses could be suspended, and that penalties often were applied were also lowest in New Mexico. This article further considers the implications of these results: The potential of zero tolerance laws will not be realized without better awareness among young people. Full enforcement of the laws accompanied by publicity about the enforcement is recommended. Changes to the laws and their application may encourage enforcement efforts. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Grant, D. (2010). Dead on arrival: Zero tolerance laws don't work. *Economic Inquiry*, 48(3), 756-770.

By 1998, all states had passed laws lowering the legal blood alcohol content for drivers under 21 to effectively zero. Theory shows these laws have ambiguous effects on overall fatalities and economic efficiency, and the data show they have little effect on driver behavior. A panel analysis of the 1988-2000 Fatality Analysis Reporting System indicates that zero tolerance laws have no material influence on the level of fatalities, while quantile regression reveals virtually no change in the distribution of blood alcohol content among drivers involved in fatal accidents. Copyright 2010, Wiley-Blackwell

Holmgren, A., Holmgren, P., Kugelberg, F. C., Jones, A. W., & Ahlner, J. (2008). High re-arrest rates among drug-impaired drivers despite zero-tolerance legislation. *Accident Analysis and Prevention*, 40(2), 534-540. doi:10.1016/j.aap.2007.08.009

Background: A zero-tolerance law for driving under the influence of drugs (DUID) in Sweden led to a 10-fold increase in the number of cases submitted by the police for toxicological analysis. The statutory blood-alcohol concentration (BAC) limit for driving is 0.2mg/g (~0.02g%). Methods: An in-house database (TOXBASE) was used to investigate re-arrests for impaired driving over 4 years (2001-2004), which comprised 36,799 cases. The age, gender, re-arrest rate of the offenders and the concentrations of ethanol and amphetamine in blood samples were evaluated. Results: We found that 44% of individuals (N = 16,277) re-offended 3.2 times on average (range 1-23 arrests). Between 85 and 89% of first-time offenders were men and there was also a male dominance among the recidivists (88-93%). The mean age of drunken drivers was ~40 years compared with ~35 years for driving under the influence of amphetamine, which was the drug identified in 50-60% of DUID cases, either alone or together with other licit or illicit drugs. The median BAC was 1.5mg/g (~0.15g%), which suggests a dominance of heavy drinkers. The median BAC was even higher in recidivists (1.6-1.7mg/g). The median concentration of amphetamine in blood was 1.0mg/L in recidivists compared with 0.5mg/L in the first-time offenders. About 14% of drunken drivers re-offended 1-10 times compared with 68% of DUID suspects, who were re-arrested 1-23 times. People with only a scheduled prescription drug in blood were re-arrested much less frequently (~17%) compared with those taking illicit drugs (68%). Conclusions: The appreciable increase in number of arrests for DUID after a zero-tolerance law might reflect a heightened enthusiasm by the police authorities armed with knowledge that a prosecution is easier to obtain. Zero-tolerance laws do not deter people from impaired driving judging by the high re-arrest rates. During the sentencing of hardcore offenders, the courts should give more consideration to the underlying substance abuse problem. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Jones, W. (2004). Update on sweden's zero-concentration law for narcotic drugs in blood of drivers. *Glasgow: ICADTS*, 5.

In 1999, Sweden introduced a zero-concentration limit for narcotic (scheduled drugs) in blood of drivers. Since this legislation there has been an 8-fold increase in cases of driving under the influence of drugs. In about 85%-90% of these cases, blood specimens contain one or more banned substances, most commonly amphetamine and marijuana. The zero tolerance law doesn't require evidence of impairment. In addition to street drugs there is also concern about prescription drugs, e.g. sedative-hypnotics, like

benzodiazepines. If prescription drugs are identified, expert testimony is required to confirm their having been prescribed and also drug analysis conducted to determine if the amount present is above the established therapeutic dose. Those who have been arrested since the zero tolerance law are primarily the criminal element, commonly without a valid driving license, with prior convictions for drunk/drugged driving or drug related crime. Recidivism is as high as 50-60%, so the zero tolerance law does not function as a deterrent. There is no accompanying PowerPoint presentation. Copyright 2006, Project Cork

Liang, L., & Huang, J. D. (2008). Go out or stay in? the effects of zero tolerance laws on alcohol use and drinking and driving patterns among college students. *Health Economics*, 17(11), 1261-1275.

Zero tolerance laws make it illegal per se for anyone under age 21 to drive with any measurable amount of blood alcohol. Although a link has been established between zero tolerance laws and lower motor vehicle fatalities, research has not produced strong evidence on how zero tolerance laws influence individual alcohol use and drinking and driving behaviors. Using a unique data set and a difference-in-difference-in-difference-type research design, we are able to analyze a number of pathways through which zero tolerance laws can work among an important underage population, college students. We find that zero tolerance laws reduce drinking and driving among college students. Further analysis of our detailed alcohol use measures suggests that zero tolerance laws are particularly effective at reducing the probability of driving after drinking for those who reported drinking away from home. Copyright 2008, John Wiley & Sons

Lillisunde, P. (2004). Zero-tolerance law for drugs and driving in Finland. *Glasgow: ICADTS*, 5.

In early 2003, a zero limit law for illicit drugs and driving was introduced in Finland. The law is applied to scheduled drugs, those listed in the UN Convention on narcotics and psychotropic substances. The law is applied if controlled drug or their metabolites are found in the blood. This does not apply if the driver has a right to use the substances, i.e. a physician's prescription. The driver is convicted for driving while intoxicated if the driving ability is impaired by drug use. Blood/urine samples are analyzed by the National Public Health Institute and laboratory reports provided to the court. In the first year following passage of the zero tolerance law, the number of samples submitted for analysis increased about 60%. The most common drugs identified are benzodiazepines, amphetamine and cannabis. There statistics of suspected cases and findings are presented. There is an accompanying PowerPoint presentation with 26 slides. Copyright 2006, Project Cork

Vinsel, N. (2012). Drinking and driving school buses: Zero alcohol tolerance for public school bus drivers. (54 legal refs.). *Journal of Law & Education*, 41(January), 271-279.

Summary. ... These regulations include workplace anti-drug and alcohol policies, which protect public safety by deterring alcohol misuse and illegal drug use. ... In order to understand why zero tolerance policies for alcohol are not a radical departure from federal regulations, one must understand how the blood alcohol standards were developed for commercial drivers. ... The majority of states established a 0.10% blood alcohol content for all drivers, but under the terms of the Act, states would lose federal highway funds if they did not comply with the Act, including blood alcohol content standards. ... Refusing to submit to testing leads to the same sanctions as a positive blood alcohol content. ... Employers must rely on breath tests, rather than behavior, to detect low levels of alcohol content. Copyright 2012, Jefferson Law Book Company

Voas, R. B., Tippetts, A. A. S., & Fell, J. C. (2003). Assessing the effectiveness of minimum legal drinking age and zero tolerance laws in the United States. e-mail: Voas@pire.org. *Accident Analysis and Prevention*, 35(4), 579-587.

The objective of this research was to determine the extent to which the decline in alcohol-related highway deaths among drivers younger than age 21 years can be attributed to raising the minimum legal drinking age (MLDA) and establishing zero

tolerance (0.02% blood alcohol concentration (BAC) limit for drivers younger than age 21 years) laws. Data on all drivers younger than age 21 years involved in fatalities in the United States from 1982 to 1997 were used in the study. Quarterly ratios of BAC-positive to BAC-negative drivers in each of the 50 states were analyzed in a pooled cross-sectional time-series analysis. After accounting for differences among the 50 states in various background factors, changes in economic and demographic factors within states over time, and the effects of other related laws, results indicated substantial reductions in alcohol-positive involvement in fatal crashes were associated with the two youth-specific laws. The policy of limiting youth access to alcohol through MLDA laws and reinforcing this action by making it illegal for underage drivers to have any alcohol in their system appears to have been effective in reducing the proportion of fatal crashes involving drinking drivers. Copyright 2003, Elsevier Science Ltd.

Zwerling, C., & Jones, M. P. (1999). Evaluation of the effectiveness of low blood alcohol concentration laws for younger drivers. *American Journal of Preventive Medicine*, 16(1), 76-80. doi:10.1016/S0749-3797(98)00114-7

Reviewed studies to determine if zero tolerance and low blood alcohol concentration (BAC) laws have reduced alcohol-related motor vehicle injuries and fatalities. The search strategy included electronic databases, lists of past studies and reviews, government publications, and experts. Studies were included that provided objective data on outcomes (crashes, injuries, fatalities) and if there was a comparison group. All 6 (ecologic) studies that met criteria showed a reduction in injuries or crashes after implementation of the law. For 3 studies reductions were not statistically significant. Reductions in the other studies were 11–33%. One study evaluated laws with differing BAC levels and found a dose-response effect. The greatest reduction (22%) was reported for nighttime, single vehicle fatalities in states with zero BAC laws. In states with .02% laws, the reduction averaged 17% and in states with .04–.06% laws, the reduction was only 7%. Despite methodologic difficulties, these studies support the laws' effectiveness. The evidence is strengthened because similar results were found in different countries (Australia and the US), using different laws, outcome variables and methodologies. (PsycINFO Database Record (c) 2012 APA, all rights reserved)