



**RESEARCH SUMMARY**  
Date Compiled: March 2021

**Key takeaways from included research:**

- Alcohol and/or firearms were involved in 63.9% of suicides in the United States in 2015. Higher alcohol and gun law scores were associated with reduced incidence rates and odds of suicides involving either alcohol or firearms. For example, a 10% increase in alcohol policy score was associated with a 28% reduction in the rate of suicides involving alcohol or firearms.
- Hand-eye coordination is dramatically more sensitive to alcohol with some measures of coordination impaired by more than 20% at BAC levels as low as 0.015%, according to the study authors.
- Researchers found that the use of alcohol, tobacco, and other drugs by young people is associated with a higher likelihood of premature and extremely premature atherosclerotic cardiovascular diseases (ASCVD). Compared to patients with non-premature ASCVD, patients with premature ASCVD had a higher use of tobacco (62.9% vs 40.6%), alcohol (31.8% vs 14.8%), cocaine (12.9% vs 2.5%), amphetamine (2.9% vs 0.5%) and cannabis (12.5% vs 2.7%) ( $p < 0.01$  for all comparisons).
- Ride-hailing services are associated with an increase in binge drinking, which has been associated with a wide array of adverse health outcomes. Drunk driving rates have fallen for more than a decade, while binge drinking continues to climb. Both trends may be accelerated by ride-hailing services.

## **ALCOHOL POLICIES, FIREARM POLICIES, AND SUICIDE IN THE UNITED STATES: A LAGGED CROSS-SECTIONAL STUDY**

**March 2021**

### **Abstract**

**Background:** Alcohol and firearms are commonly involved in suicide in the United States. State alcohol and firearm policies may impact alcohol and firearm related suicide, yet little is known about these relationships. This study examines relationships between state alcohol and firearm policies and suicides involving alcohol, guns, or both, and explores interactive policy associations.

**Methods:** Alcohol policies were assessed with the Alcohol Policy Scale. Firearm policies were assessed using the Gun Law Scorecard from Giffords Law Center. Suicide data from the National Violent Death Reporting System in 2015 covered 22 states. State- and individual-level GEE Poisson and logistic regression models assessed relationships between policies and firearm- and/or alcohol-involved suicides with a 1-year lag.

**Results:** In 2015, there were 8996 suicide deaths with blood alcohol concentration test results in the 22 included states. Of those deaths, alcohol and/or firearms were involved in 5749 or 63.9%. Higher alcohol and gun law scores were associated with reduced incidence rates and odds of suicides involving either alcohol or firearms (adjusted incidence rate ratios [IRR] 0.72 (95% CI 0.63, 0.83) for alcohol policies, 0.86 (95% CI 0.82, 0.90) for firearm policies). Relationships were similar for suicides involving both alcohol and firearms, and there was an interactive effect, such that states with restrictive policies for both had the lowest rates of suicides involving alcohol or guns.

**Conclusions:** More restrictive alcohol and firearm policies are associated with lower rates and odds of suicides involving alcohol or firearms, and alcohol and firearms, and may be a promising means by which to reduce suicide.

**Source:** Coleman, S.M., Lira, M.C., Blanchette, J., *et al.* Alcohol policies, firearm policies, and suicide in the United States: a lagged cross-sectional study. *BMC Public Health*, 21, 366 (2021). <https://doi.org/10.1186/s12889-021-10216-x>.

## **DOSE-DEPENDENT SENSORIMOTOR IMPAIRMENT IN HUMAN OCULAR TRACKING AFTER ACUTE LOW-DOSE ALCOHOL ADMINISTRATION**

**February 2021**

### **Abstract**

Changes in oculomotor behaviours are often used as metrics of sensorimotor disruption due to ethanol (EtOH); however, previous studies have focused on deficits at blood-alcohol concentrations (BACs) above about 0.04%. We investigated the dose dependence of the impairment in oculomotor and ocular behaviours caused by EtOH administration across a range of ultra-low BACs ( $\leq 0.035\%$ ). We took repeated measures of oculomotor and ocular performance from sixteen participants, both pre- and post-EtOH administration. To assess the neurological impacts across a wide range of brain areas and pathways, our protocol measured 21 largely independent performance metrics extracted from a range of behavioural responses ranging from ocular tracking of radial step-ramp stimuli, to eccentric gaze holding, to pupillary responses evoked by light flashes. Our results show significant impairment of pursuit and visual motion processing at 0.015% BAC, reflecting degraded neural processing within extrastriate cortical pathways. However, catch-up saccades largely compensate for the tracking displacement shortfall caused by low pursuit gain, although there still is significant residual retinal slip and thus degraded dynamic acuity. Furthermore, although saccades are more frequent, their dynamics are more sluggish (i.e. show lower peak velocities) starting at BAC levels as

low as 0.035%. Small effects in eccentric gaze holding and no effect in pupillary response dynamics were observed at levels below 0.07%, showing the higher sensitivity of the pursuit response to very low levels of blood alcohol, under the conditions of our study.

**Source:** Tyson, T.L., Feick, N.H., Cravalho, P.F., Flynn-Evans, E.E., Stone, L.S. Dose-dependent sensorimotor impairment in human ocular tracking after acute low-dose alcohol administration. *The Journal of Physiology*, 599(4):1225-1242 (2021). doi: 10.1113/JP280395.

## **RECREATIONAL SUBSTANCE USE AMONG PATIENTS WITH PREMATURE ATHEROSCLEROTIC CARDIOVASCULAR DISEASE** **February 2021**

### **Abstract**

**Objective:** Despite an upsurge in the incidence of atherosclerotic cardiovascular diseases (ASCVD) among young adults, the attributable risk of recreational substance use among young patients has been incompletely evaluated. We evaluated the association of all recreational substances with premature and extremely premature ASCVD.

**Methods:** In a cross-sectional analysis using the 2014–2015 nationwide Veterans Affairs Healthcare database and the Veterans with premaTure Atherosclerosis (VITAL) registry, patients were categorised as having premature, extremely premature or non-premature ASCVD. Premature ASCVD was defined as having first ASCVD event at age <55 years for men and <65 years for women. Extremely premature was defined as having first ASCVD event at age <40 years while non-premature ASCVD was defined as having first ASCVD event at age ≥55 years for men and ≥65 years for women. Patients with premature ASCVD (n=135 703) and those with extremely premature ASCVD (n=7716) were compared against patients with non-premature ASCVD (n=1 112 455). Multivariable logistic regression models were used to study the independent association of all recreational substances with premature and extremely premature ASCVD.

**Results:** Compared with patients with non-premature ASCVD, patients with premature ASCVD had a higher use of tobacco (62.9% vs 40.6%), alcohol (31.8% vs 14.8%), cocaine (12.9% vs 2.5%), amphetamine (2.9% vs 0.5%) and cannabis (12.5% vs 2.7%) (p<0.01 for all comparisons). In adjusted models, the use of tobacco (OR 1.97, 95% CI 1.94 to 2.00), alcohol (OR 1.50, 95% CI 1.47 to 1.52), cocaine (OR 2.44, 95% CI 2.38 to 2.50), amphetamine (OR 2.74, 95% CI 2.62 to 2.87), cannabis (OR 2.65, 95% CI 2.59 to 2.71) and other drugs (OR 2.53, 95% CI 2.47 to 2.59) was independently associated with premature ASCVD. Patients with polysubstance use had a graded response with the highest risk (~9-fold) of premature ASCVD among patients with use of ≥4 recreational substances. Similar trends were observed among patients with extremely premature ASCVD. Gender interactions with substance use were significant (p-interaction <0.05), with recreational substance use and premature ASCVD showing stronger associations among women than in men with premature ASCVD.

**Conclusions:** All subgroups of recreational substances were independently associated with a higher likelihood of premature and extremely premature ASCVD. Recreational substance use confers a greater magnitude of risk for premature ASCVD among women. A graded response relationship exists between increasing number of recreational substances used and higher likelihood of early-onset ASCVD.

**Source:** Mahtta, D., Ramsey, D., Krittanawong, C., *et al.* Recreational substance use among patients with premature atherosclerotic cardiovascular disease. *Heart*, (2021). doi: 10.1136/heartjnl-2020-318119.

## **RIDE-HAILING SERVICES AND ALCOHOL CONSUMPTION: LONGITUDINAL ANALYSIS**

January 2021

### **Abstract**

**Background:** Alcohol consumption is associated with a wide range of adverse health consequences and a leading cause of preventable deaths. Ride-hailing services such as Uber have been found to prevent alcohol-related motor vehicle fatalities. These services may, however, facilitate alcohol consumption generally and binge drinking in particular.

**Objective:** The goal of the research is to measure the impact of ride-hailing services on the extent and intensity of alcohol consumption. We allow these associations to depend on population density as the use of ride-hailing services varies across markets.

**Methods:** We exploit the phased rollout of the ride-hailing platform Uber using a difference-in-differences approach. We use this variation to measure changes in alcohol consumption among a local population following Uber's entry. Data are drawn from Uber press releases to capture platform entry and the Behavioral Risk Factor Surveillance Systems (BRFSS) Annual Survey to measure alcohol consumption in 113 metropolitan areas. Models are estimated using fixed-effects Poisson regression. Pre- and postentry trends are used to validate this approach.

**Results:** Ride-hailing has no association with the extent of alcohol consumption in high (0.61 [95% CI -0.05% to 1.28%]) or low (0.61 [95% CI -0.05% to 1.28%]) density markets, but is associated with increases in the binge drinking rate in high-density markets (0.71 [95% CI 0.13% to 1.29%]). This corresponds to a 4% increase in binge drinking within a Metropolitan Statistical Area.

**Conclusions:** Ride-hailing services are associated with an increase in binge drinking, which has been associated with a wide array of adverse health outcomes. Drunk driving rates have fallen for more than a decade, while binge drinking continues to climb. Both trends may be accelerated by ride-hailing services. This suggests that health information messaging should increase emphasis on the direct dangers of alcohol consumption and binge drinking.

**Source:** Burtch, G., Greenwood, B.N., McCullough, J.S. Ride-hailing services and alcohol consumption: Longitudinal analysis. *Journal of Medical Internet Research*, 23(1) (2021). e15402.