U.S. Department of Transportation
National Highway Traffic Safety Administration

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Drug and Alcohol Crash Risk Study

Executive Summary

A new study by the National Highway Traffic Safety Administration, the largest and most carefully controlled of its kind to date, examines the crash risk associated with alcohol and drug use by drivers. The study used a case-control methodology, a research method commonly used in medicine and social science for studying risk factors for disease or other negative outcomes.

The effect of driver impairment on crash risk is a complex issue and precise answers are beyond the reach of any single study design. However this new study is an important step in the accumulation of scientific evidence on this critical issue.

Alcohol Findings

The study found that alcohol use by drivers was clearly associated with elevated risk of crash involvement:

- Drivers who had been drinking at the .08 breath alcohol concentration (BrAC) had about 4 times the risk of crashing as sober drivers. (Note: The .08 BrAC and blood alcohol concentration [BAC] are the per se legal limit in every State.)
- Drivers with alcohol levels at .15 BrAC had 12 times the risk.

Drug Findings

Drivers participating in the study were tested for a large number of potentially impairing drugs using both oral fluid (saliva) and blood samples. Marijuana (THC) was the only single category of drug for which study findings reached statistical significance.

Drivers testing positive for THC were overrepresented in the crash-involved (case) population. However, when demographic factors (age and gender) and alcohol use were controlled, the study did not find an increase in population-based crash risk associated with THC use.

Study Design and Methodology

The study was conducted in Virginia Beach, Virginia, over a 20-month period ending in 2012. More than 3,000 crash-involved drivers were included as case subjects. Two control subjects were selected for each case subject by random selection from traffic at the same location, day of week, time of day, and direction of traffic as the crash-involved case subjects. This careful matching of cases and controls was critical for the validity of the findings.
About 66 percent of the case subjects were involved in property-damage-only crashes and 33 percent were involved in injury crashes. Less than 1 percent of case subjects were involved in fatal crashes.

Strengths of this study design include the large number of case and control subjects, careful matching of case and control samples, and consistent protocols for alcohol and drug testing. Limitations of the study include a crash distribution biased toward less severe events. Findings based a sample of more severe crashes may differ. The study could not control for factors that could affect impairment by THC such the amount ingested, the potency ingested, prior experience with THC, and individual differences in response to THC.