Increased collision risk among drivers who report driving after using alcohol and after using cannabis

Dear Editor:

Alcohol and cannabis are the two most commonly used psychoactive drugs in Canada: about 80% of adults consume alcohol, while nearly half report trying cannabis in their lifetime.¹ It has long been known that driving under the influence of alcohol (DUIA) increases collision risk,^{2,3} and more recent evidence suggests that driving under the influence of cannabis (DUIC) does as well (e.g., refs. 4,5). Little research exists on the prevalence of people who report both DUIA and DUIC, or on collisions experienced by this group. Described here is the self-reported collision risk among drivers who report DUIA and DUIC in the Ontario adult population. Though these data cannot distinguish whether these behaviours occur concurrently, population data such as these can be useful in assessing the health risks facing individuals who report these behaviours.

Data were based on the CAMH Monitor (CM), an annual repeated cross-sectional survey of Ontario adults. Since 2002, the CM includes an item on collision involvement in the previous 12 months; thus for the current study, data from 2002 to 2010 were merged (N=16,224). Each annual cycle of the CM is based on telephone interviews with a randomly selected sample ranging between 2,005 and 3,039 adults aged 18 years and older. The weighted sample is representative of the Ontario general adult population (response rates: 51% to 58%). Further information can be found in Ialomiteanu et al. (2012).⁶

Past-year self-reported collision involvement was examined in three groups (no DUIA or DUIC, either DUIA or DUIC, both DUIA and DUIC). All analyses are based on the weighted sample size, using STATA software. The association between collision involvement and independent variables was first examined using Chi-square analyses. Logistic regression analysis estimates the correlation between reporting neither DUIA nor DUIC, and reporting both DUIA and DUIC, on collision risk while controlling for demographic characteristics that significantly affected collision risk.

Figure 1. Percentage of respondents involved in collisions by substance(s) used while driving (CAMH Monitor, 2002-2010)

Vertical bars represent 95% confidence intervals. Neither DUIA nor DUIC = No driving after alcohol and no driving after cannabis use; DUIA or DUIC = driving after reported use of cannabis or alcohol only; DUIA and DUIC = reported driving after alcohol and driving after cannabis use.

Significant differences in the prevalence of self-reported collision involvement by driving after substance use were found (Figure 1). Drivers reporting neither DUIA nor DUIC (91.3% of the sample) had the lowest prevalence of collisions (6.7%). Those reporting either DUIA or DUIC (7.7% of the sample) reported a significantly higher prevalence of collision involvement of 9.6% ($p<0.01$). The highest likelihood of collision involvement (30.5%, $p<0.01$) was found among drivers reporting both behaviours (0.9% of the sample). Logistic regression analysis revealed that, after controlling for demographic factors, drivers reporting neither DUIA nor DUIC were significantly less likely to experience a collision than those who reported one of these behaviours (OR = 0.74, 95% CI 0.56-0.98, $p<0.05$) (see Table 1). People who reported both DUIA and DUIC had the highest collision risk, with over three times greater odds of collision involvement than those who reported only DUIA or DUIC (OR = 3.65, 95% CI 2.12-6.28, $p<0.001$).

Table 1. Self-reported collision involvement by sample characteristics and final regression model: CAMH Monitor, 2002-2010

	Sample N	Collision involvement† %	95% CI	Adjusted OR	95% CI
Total	16224	7.2	[6.8-7.8]		
Age (Years)				***	
18-34	3164	10.1	[8.9-11.4]	1.81***	[1.49-2.21]
35-54	6906	6.7	[6.0-7.4]	1.23*	[1.03-1.47]
55+	5798	5.4	[4.7-6.1]	R	
Region				**	
Toronto	2269	8.1	[6.9-9.5]	R	
Central East	2766	7.7	[6.6-9.0]	0.98	[0.77-1.25]
Central West	2708	7.5	[6.5-8.8]	0.95	[0.75-1.21]
West	2852	5.7	[4.8-6.7]	0.69**	[0.54-0.89]
East	2722	6.9	[5.9-8.1]	0.86	[0.67-1.10]
North	2907	5.7	[4.8-6.7]	0.70**	[0.55-0.91]
Driving after cannabis/alcohol use in the last 12 months				***	
No driving after cannabis/alcohol use	14791	6.7	[6.2-7.2]	0.74*	[0.56-0.98]
Driving after one substance only	1133	9.6	[6.5-12.2]	R	
Driving after cannabis plus alcohol use‡	130	30.5	[21.6-41.2]	3.65***	[2.12-6.28]

† At least once in the last 12 months.

‡ Coefficient of variation = 16.6.

Statistical significance (Rao Scott adjusted Chi-square or design-based Wald test): * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

Adjusted Odds Ratio holding fixed values for age and region.

R = reference category.

No previous studies have examined collision risk among people who self-report both DUAI and DUIC. The current data suggest that those who report both behaviours could be at a particularly high risk for collision.

Gillian Sayer, MSc,^{1,2} Anca Ialomiteanu, MA,¹ Gina Stoduto, MEd,¹

Christine M. Wickens, PhD,¹ Robert E. Mann, PhD,^{1,3}

Bernard Le Foll, MD, PhD,^{1,2,4} Bruna Brands, PhD^{1,2,5}

1. Social and Epidemiological Research, CAMH, Toronto, ON

2. Department of Pharmacology, University of Toronto, Toronto, ON

3. Dalla Lana School of Public Health, University of Toronto, Toronto, ON

4. Translational Addiction Research Laboratory, Campbell Family Mental Health Research Institute; Alcohol Research and Treatment Clinic, Addiction Medicine Services, Ambulatory Care and Structured Treatments, CAMH; Departments of Family and Community Medicine, Psychiatry, Institute of Medical Sciences, University of Toronto, Toronto, ON

5. Office of Research and Surveillance, Controlled Substances and Tobacco Directorate, Health Canada, Ottawa, ON

Correspondence: Dr. Bruna Brands, 33 Russell Street, Toronto, ON M5S 2S1, E-mail: bruna.brands@hc-sc.gc.ca

REFERENCES

1. Canadian Alcohol and Drug Use Monitoring Survey, 2011. Ottawa, ON: Health Canada, 2012. Available at: http://www.hc-sc.gc.ca/hc-ps/drugs-drogues/stat/_2011/summary-sommaire-eng.php#a6 (Accessed March 24, 2014).
2. Borkenstein RF, Crowther RF, Shumate RP, Ziel WB, Zylman R. The role of the drinking driver in traffic accidents (the Grand Rapids Study). *Blutalcohol* 1974;11 (Suppl. 1):7-13.
3. Movig KLL, Mathijssen MPM, Nagel PHA, van Egmond T, de Gier JJ, Leufkens HGM, Egbers ACG. Psychoactive substance use and the risk of motor vehicle accidents. *Accid Anal Prev* 2004;36:631-36.
4. Asbridge M, Hayden JA, Cartwright JL. Acute cannabis consumption and motor vehicle collision risk: Systematic review of observational studies and meta-analysis. *BMJ* 2012;344:e536 doi: 10.1136/bmj.e536.
5. Mann RE, Stoduto G, Ialomiteanu A, Asbridge M, Smart RG, Wickens CM. Self-reported collision risk associated with cannabis use and driving after cannabis use among Ontario adults. *Traffic Injury Prevention* 2010;11:115-22.
6. Ialomiteanu AR, Adlaf EM, Hamilton H, Mann RE. CAMH Monitor eReport: Addiction and Mental Health Indicators Among Ontario Adults (1977-2011). Toronto, ON: Centre for Addiction and Mental Health, 2012.