

# Impact of Binge Alcohol on Mortality Among People who Inject Drugs

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## Background

- Fatal overdose accounts for the majority of deaths in the illicit drug using population.
- The concurrent use of illicit drugs and alcohol is known to be a major contributor to overdose mortality.
- There are limited data that explore the impact of binge alcohol use patterns on all-cause mortality among people who inject drugs (PWID).
- The present study examines the impact of binge alcohol use on mortality for PWID in a Canadian setting.

## Methods

- This study was performed using data from the Vancouver Injection Drug Users Study (VIDUS) and AIDS Care Cohort to Evaluate Access to Survival Services (ACCESS), which are longstanding prospective cohorts of PWID operating in the Downtown Eastside of Vancouver, Canada.
- At baseline and semi-annually thereafter, participants complete an interviewer-administered questionnaire and provide blood samples. Questionnaires ascertain a range of data including demographic characteristics, injection and non-injection drug use and sexual risk behaviours.
- A confidential linkage with the British Columbia Vital Statistics Agency was used to ascertained dates and causes of death among study participants and through ongoing locator contacts provided by study participants
- The primary outcome of interest was time to death (all-cause).
- The primary explanatory variable of interest was binge alcohol use, defined by answering “Yes” to the question, “Have you binged on alcohol in the last 6 months (that is when you used alcohol more than usual)”?
- Extended Cox model was used to examine the relationship between explanatory variable and time to death.

## Results

- The study sample included 2550 individuals followed between May 1996 and November 2013.
- Individuals were followed for a median of 75.4 months (IQR 37.9-113.2).
- At baseline 15% (N=381) reported binge alcohol use in the last 6 months and 31% (N=795) at any follow up visit.
- Overall, 530 individuals died for an incidence density of 2.9 (95% CI: 2.7-3.2) deaths per 100 person years.
- The primary causes of death included HIV related mortality (23.4%), accidental poisonings (22.1%), unspecified causes (13.8%) and cardiovascular disease (6.3%).

Bivariable and multivariable analyses of time to all-cause death among 2550 people who use injection drugs, Vancouver, Canada, 1996 – 2013.

Variable	Unadjusted Hazard Ratio			Adjusted Hazard Ratio		
	HR	(95% CI)	p-value	HR	(95% CI)	p-value
<b>Binge alcohol use*</b> (Yes vs. No)	1.38	(1.05 – 1.83)	0.023	1.41	(1.06 – 1.88)	0.018
<b>Gender</b> (Male vs. Female)	1.08	(0.91 – 1.30)	0.372			
<b>Age</b> (Per 10-year older)	1.26	(1.15 – 1.38)	<0.001	1.29	(1.17-1.42)	<0.001
<b>Ethnicity</b> (Caucasian vs. Non-Caucasian)	1.07	(0.90 – 1.28)	0.421			
<b>Unstable housing*</b> (Yes vs. No)	1.34	(1.13 – 1.60)	<0.001			
<b>HIV serostatus*</b> (Positive vs. Negative)	2.49	(2.10 – 2.96)	<0.001	2.53	(2.12-3.01)	<0.001
<b>Enrolment in MMT*</b> (Yes vs. No)	0.80	(0.68 – 0.95)	0.013	0.80	(0.67-0.95)	0.010
<b>≥ Daily heroin injection*</b> (Yes vs. No)	0.81	(0.65 – 1.02)	0.069			
<b>≥ Daily cocaine injection*</b> (Yes vs. No)	1.46	(1.17 – 1.82)	<0.001	1.44	(1.15-1.80)	0.002
<b>≥ Daily crack cocaine smoking*</b> (Yes vs. No)	0.89	(0.73 – 1.08)	0.250			
<b>≥ Daily amphetamine injection*</b> (Yes vs. No)	0.24	(0.06-0.96)	0.043			

Note: CI = confidence interval; HR = hazard ratio; MMT=methadone maintenance treatment  
\*Behaviors and status in the last six months.

- In the multivariable analysis, after adjustment for potential confounders including age, HIV serostatus, daily cocaine injection and enrolment in methadone maintenance treatment, binge alcohol use remained independently and positively associated with time to all-cause mortality (Adjusted Hazard Ratio = 1.41 [95% CI: 1.06-1.88]).

## Conclusions

- Our findings that binge alcohol use is associated with an increased risk for mortality is unique as we are unaware of any study that specifically examined binge alcohol use and all-cause mortality risk for PWID.
- This study may suggest that binge alcohol use or any alcohol use that can be categorized as high risk drinking is an important and distinct from people who identify as daily drinkers including those who have not been diagnosed with an alcohol use disorder but engage in binge type alcohol use.
- Limitations of this study include self-reported measures, non-random sample, binge alcohol use not described proximal to the time of death, underreporting of death rates due to migration and possible residual confounding rather than a casual relationship between binge alcohol use and mortality.
- While these findings are limited by their observational nature, they reinforce the continued need to incorporate addiction treatment, public health interventions and policies that address binge alcohol use to reduce alcohol related-harms.

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