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Patron Offending and Intoxication in Night-Time Entertainment Districts (POINTED)

Executive summary

Funded by the National Drug Law Enforcement Research Fund
An Initiative of the National Drug Strategy

Patron Offending and Intoxication in Night-Time Entertainment Districts (POINTED)

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Introduction

Risky drinking is the subject of considerable community concern in Australia and internationally, particularly the risky drinking practices of young people consuming alcohol in the night-time economy (Miller, et al. 2011b). In Australia, one in four young people (aged between 15 and 24 years) reported that in the past year they had consumed alcohol, at levels associated with short-term harm, on a weekly to monthly basis. More than 40 percent of young people reported having consumed more than 20 standard drinks on a single occasion during that time (Chikritzhs & Pascal, 2004; Victorian Drug and Alcohol Prevention Council 2010). This trend is concerning given that estimates indicate that up to 47 percent of alcohol-related deaths can be attributed to single sessions of heavy episodic drinking (Stockwell, et al. 1998).

In 2004/05 the estimated cost of alcohol to the community was $15.6 billion, including crime, violence, treatment costs, loss of productivity and premature deaths (Collins & Lapsley 2008). Alcohol consumption has been shown to increase the likelihood and extent of aggressive and violent behaviours and to reduce an individual's cognitive and verbal capacity to resolve conflict, thereby increasing the likelihood of involvement in arguments or fights (Australian Bureau of Statistics 2007). Furthermore, alcohol at or more than 0.05 blood alcohol concentration (BAC) significantly increases the potential for fatal car accidents (Drummer, et al. 2003). For these reasons, alcohol places a significant burden on emergency services personnel, including police, paramedics and hospital staff.

While previous research has explored the role that factors such as transport, environment and security have on harms associated with heavy episodic drinking, little is known about how consumption practices affect harm. For example, it is not known what levels of BAC are associated with risky behaviour and experience of harm, nor what drinking practices (for example, pre-loading or consuming shots, energy drinks or 'alco-pops') are associated with increased harm in the night-time environment. Further, it is not known how duration of drinking episode, intoxication levels upon entering and leaving licensed venues and venue characteristics (ie venue type, venue closing time, venue capacity) impact on experiences of harm.

As with alcohol, reliable evidence on the prevalence of substance use within the night-time economy is lacking. A recent Australian study has identified that only a small proportion (around 7%) of patrons entering nightclubs in two regional cities reported any form of drug use (Miller, et al. 2011b). Psychostimulants (ieecstasy, methamphetamine and cocaine) are the most widely used illicit drugs within licensed leisure spaces (Australian Institute of Health and Welfare, 2011; Sindich & Burns 2010). A recent event-based analysis in Melbourne showed that almost one in five young psychostimulant users (19%) reported engaging in an argument or fight during their most recent session of use (typically with a peer from their close social network), around one in six participants (16%) had an accident of some sort (related to intoxication) or injured themselves, and almost one in three (29%) reported regretting decisions that they had made during the course of the session (Jenkinson, et al. 2009). However, this data is limited by its geographically specific focus on regional cities, and the absence of objective data to validate the quality of self-report.

Epidemiological and social research has documented that most illicit drug users are polydrug users (Jenkinson, et al. 2004). However, drug research often focuses either on alcohol or illicit drugs, and only sometimes on the interaction between them. This is a potentially important area of study given that concurrent use of alcohol and other drugs can exacerbate both the risks and harms associated with any of these drugs when used in isolation, and poses particular challenges for venue management, regulators and policy makers. While we know psychostimulants are the most widely used illicit drugs in the night-time economy little is known about rates of illicit drug use and popular polydrug use combinations in this context. Further, no information is available about which substances (and polydrug combinations) are associated with engagement in risky behaviour and experiencing harm or what forms of harm are caused by drug use.

A recent and emerging consumption practice in licensed venues involves combining alcohol with energy drinks (AEDs). The only prevalence data available in Australia shows that 69 percent of regular ecstasy users

surveyed as part of the Ecstasy and Related Drugs Reporting System (EDRS) had previously consumed AEDs. A small but growing body of research demonstrates that the combination of alcohol and energy drinks may be associated with a range of harms, although controversy surrounds this issue. Energy drinks enable wakefulness and alertness, which may mask the feelings of intoxication and lead to greater consumption of alcohol over a longer period of time. The potential consequences of this are alcohol poisoning, impaired judgment leading to accidents (eg stepping in front of traffic), poor decision making (eg driving while intoxicated), engaging in risky behaviour (eg risky sexual behaviour, violence) and experiencing more negative consequences (eg more severe hangover) (Ferreira, et al. 2006; Jones, et al. 2012; O'Brien, et al. 2008; Pennay, et al. 2011).

The study investigated:

- the levels of intoxication of people in and around licensed venues;
- the types of substances being used by people in and around venues;
- the relationship between time of evening, duration of drinking episode and level of intoxication and harmful or risky behaviour;
- the relationship between consuming illicit drugs (or prescription drugs being used illegally); alcohol, and level of intoxication, and harmful or risky behaviour;
- the relationship between consuming energy drinks, alcohol, and level of intoxication, and harmful or risky behaviour, and
- jurisdictional differences between alcohol consumption, substance use, energy drink use, levels of intoxication, and harmful or risky behaviour.

Study design

This mixed methods cross-sectional study used two methods to collect data about consumers during an episode of alcohol and other drug use:

- short patron interviews with people entering or leaving licensed venues; and
- sessions of structured observation within licensed venues.

This study was undertaken in the night-time entertainment districts of three metropolitan cities (Sydney, Melbourne and Perth) and two regional cities (Wollongong and Geelong) in Australia. These sites were chosen specifically to investigate jurisdictional differences in alcohol and other drug consumption patterns and intoxication, and related harms. Sydney, the capital of the state of New South Wales, and Melbourne, the capital of the state of Victoria, are the two largest cities in Australia, each with over four million residents. Perth, the third metropolitan city in this study is located on the West Australian coast. Perth is the capital of Western Australia with a population of around 1.74 million and has a thriving nightlife. Wollongong is a regional city in New South Wales (population around 300,000) and Geelong is a regional city in Victoria (around 160,000).

Patron Interviews

This study was designed to be a systematic random sample (selecting every third person) of all people attending Night-time Entertainment Districts (NEDs) in five major Australian cities. However, a substantial number of people interviewed approached the research teams, meaning that the sample is not purely random. Patron interviews and breathalyser tests were conducted in busy thoroughfares in each city, as well as with patrons queuing to enter venues and leaving venues. Researchers worked in groups of six or more (Miller, et al. 2011a) and all interviewers wore easily identifiable clothing from their relevant institution. Data collection occurred approximately fortnightly in each city on a Friday or Saturday night between the hours of 10 pm and 3am, but sometimes ran as late as 5 am. Data collection occurred during Australia's warmer months (November 2011– June 2012).

In Geelong and Melbourne only, randomly selected sub samples (about every fifth person) was asked if they were willing to undergo a swab for the presence of other drugs (all responses were recorded to allow for the calculation of response rates). Results from the drug tests were recorded in the interview file and used to understand the reliability of our self-reported data.

Data analysis

The data collected from the surveys were analysed based on frequency counts. Group differences (such as different venues, time periods or differences between sites) were explored using both bi-variate (chi-square) and multivariate statistical methods (logistic regression) to adjust for socio-demographic and geographic differences. Fisher's exact test was used when bivariate outcomes were infrequent ($n<5$). The Kruskal Wallis test was used to examine variations between categorical variables with more than two levels across non-parametric continuous variables.

Results

Of the 7340 individuals approached to participate in the study, 6804 agreed to be interviewed, resulting in a response rate of 93%. The majority (62.1%, n=4227) were administered the 'full' interview, while 2577 (37.9%) were administered a brief version of the interview. Over half (61%) of the overall sample were male, with a median age of 22 years (range 18-73).

Levels of intoxication (self-report and BAC reading)

Overall, there was a positive correlation between level of self-reported intoxication and BAC reading ($r=0.55$, $p<0.001$); that is, people who reported greater subjective levels of intoxication recorded higher BAC readings (Table 1). However, there was significant variation between the different interview sites with regard to self-reported intoxication ($\chi^2=69.79$, $p<0.001$) and BAC readings ($\chi^2=239.20$, $p<0.001$). Figure 1 shows the mean BAC levels for each city throughout the night. A clear pattern of increasing BAC levels across all cities is apparent, with Melbourne and Perth showing the highest mean BAC levels at 4am. Figure 2 shows the trends for all sites by BAC level groups: .000, .001 to .05 (sober to slightly intoxicated), .051 to .10 (moderately intoxicated) and over .10 (heavily intoxicated).

Table 1 Levels of intoxication among participants, by sex and city/interview site

Self-reported behaviours	TOTAL	Male	Female	Geelong	Melbourne	Perth	Sydney	Wollongong
How intoxicated do you feel tonight (0–10)?* Median rating (range)	n=5,354 4 (0–10)	n=3,297 4 (0–10)	n=2,035 4 (0–10)	n=1,065 5 (0–10)	n=1,294 4 (0–10)	n=1,074 4 (0–10)	n=1,188 4 (0–10)	n=671 4 (0–10)
BAC reading median (range)	n=6,557 0.054 (0–0.35)	n=4,032 0.059 (0–0.34)	n=2,489 0.046 (0.00–0.35)	n=1,235 0.067 (0–0.23)	n=1,890 0.048 (0–0.33)	n=1,185 0.066 (0–0.29)	n=1,683 0.033 (0–0.35)	n=699 0.066 (0–0.28)

*Of those who reported any alcohol consumption prior to interview (pre-drinking and/or after 'going out'/attending licensed venues)

Figure 1 Mean BAC level by time of day for each site

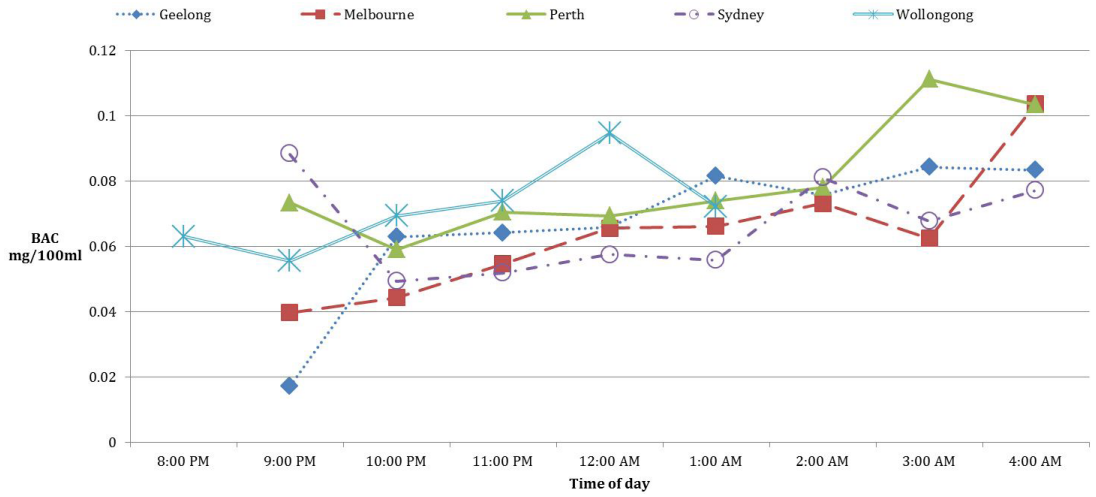
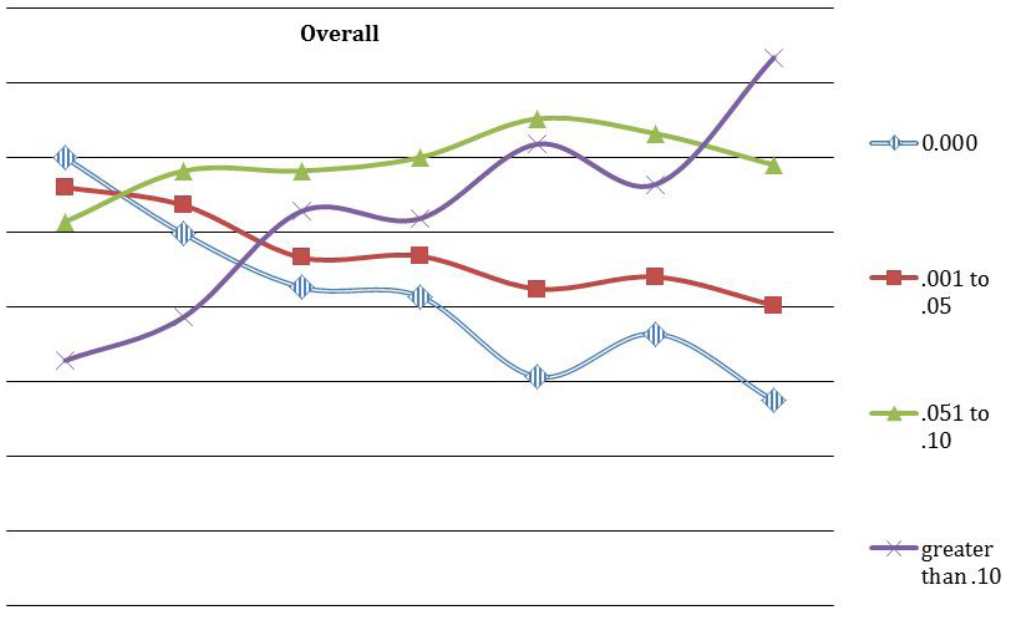


Figure 2 BAC levels for all sites per hour



Participants in Sydney were least likely to report consuming alcohol prior to interview (χ^2=99.35, 0.000), and there was significant variation between the interview sites with regard to the number of standard drinks participants reported consuming (χ^2=64.91, p<0.001).There was a significant correlation between number of hours participants administered the full interview reported 'going for' and BAC reading (*r*=0.25, p<0.001).

Pre-drinking behaviours

Almost two-thirds of the overall sample (65%) reported consuming alcohol before attending licensed venues/'going out' (Table 2). Younger participants were significantly more likely to report pre-drinking (χ^2=17.88, p=0.001), as were participants in Geelong and Perth (χ^2=452.01, p<0.001).

Table 2 Pre-drinking behaviours by sex, age and city/interview location (entire sample)

Variable	Pre-drank (%)	Median no. drinks (range)*
Sex†		
Male (n=4,151)	2,762 (67)	6 (0.5–100)
Female (n=2,605)	1,617 (62)	4 (1–50)
Age†		
18–19 (n=1,606)	1,241 (77)	6 (0.5–100)
20–24 (n=2,833)	1,906 (67)	6 (0.5–50)
25–29 (n=1,503)	770 (57)	5 (0.5–60)
30–39 (n=548)	363 (52)	5 (1–37)
40+ (n=230)	101 (44)	3 (1–20)
City/interview location†		
Geelong (n=1,260)	1,019 (81)	6 (1–100)
Melbourne (n=1,927)	1,085 (56)	4 (0.5–25)
Perth (n=1,242)	993 (80)	6 (0.5–40)
Sydney (n=1,558)	805 (52)	5 (1–32)
Wollongong (n=730)	440 (60)	4 (0.5–24)
TOTAL (N=6,798)	4,396 (65)	5 (0.5–100)

*Among participants who reported pre-drinking

†Missing gender data for 42 participants; missing age data for 78 participants; missing location data for 81 participants; missing pre-drinking data for six participants

Participants most commonly pre-drinking in private homes (82%); at private functions (5%), in cars (4%) and at work (1%). Overall, participants who reported pre-drinking were more likely to engage in heavier alcohol consumption patterns and risk behaviours (Table 3).

Table 3 Pre-drinking behaviours by current night and risk behaviours/consumption patterns

Variable	Pre-drank? Yes (n=4,396) n (%)	Pre-drank? No (n=2,402) n (%)
BAC reading, median (range)	0.068 (0–0.35)	0.021 (0–0.34)
Number standard drinks consumed*	n=2,260	n=1,365
	8 (1–60)	5 (0.5–35)
Consumed energy drinks	n=4,395	
No. energy drinks consumed**	1,141 (26)	393 (16)
Mix energy drinks with alcohol**	2 (0.25–20)	1 (0.5–15)
	840 (73)	155 (39)
Consumed illicit drugs	n=4,362	n=2,392
	818 (19)	253 (11)
Involved any aggression last three months	810 (18)	338 (14)
Incurred any alcohol-related accidents/injuries last three months	n=4,247	n=2,201
	672 (16)	235 (11)
Committed property crime last three months*	n=2,154	n=1,684
	114 (5)	45 (3)
Driven under influence last three months*	n=2,179	n=1,716
	345 (16)	202 (12)

*Only participants of the full interview

**Of those who reported energy drink consumption

Overall, price was the most commonly reported motivation for pre-drinking, with almost two thirds (61%) of self-reported pre-drinkers reporting price considerations as the most important motivator. Social motivators, such as “for fun” and “chance to catch up with friends” accounted for another 22.4% of stated reasons for pre-drinking.

Energy drink consumption

Energy drink consumption was reported by nearly one-quarter (23%) of all participants and 14.6% of participants reported combining energy drinks with alcohol. Younger participants generally consumed more energy drinks and mixed energy drinks with alcohol (χ^2=11.82, p=0.019).

Table 4 Energy drink consumption by sex, age and city/interview location (entire sample)

Variable	Consumed energy drinks tonight (%)	Median no. drinks (range)*	Mixed with alcohol (%)*
Sex†			
Male (n=4,156)	965 (23)	1.5 (0.25–17)	603 (62)
Female (n=2,605)	561 (22)	1 (0.5–20)	387 (69)
Age†			
18-19 (n=1,607)	442 (28)	1 (0.5–17)	305 (69)
20-24 (n=2,833)	703 (25)	2 (0.5–20)	461 (66)
25-29 (n=1,351)	248 (18)	1 (0.25–10)	148 (60)
30-39 (n=703)	115 (16)	1 (0.5–15)	65 (57)
40+ (n=231)	20 (9)	1 (0.5–2)	10 (50)
City/interview location†			
Geelong (n=1,262)	359 (28)	2 (0.5–15)	245 (68)
Melbourne (n=1,926)	349 (18)	1 (0.5–17)	201 (58)
Perth (n=1,244)	305 (25)	1 (0.25–10)	201 (66)
Sydney (n=1,560)	374 (24)	1.5 (0.5–20)	232 (62)
Wollongong (n=730)	126 (17)	1 (0.5–9)	102 (81)
TOTAL (N=6,803)	1,536 (23)	1 (0.25–20)	996 (65)

*Of those who reported consuming energy drinks

†Missing gender data for 42 participants; missing age data for 78 participants; missing location data for 81 participants; missing energy drink data for one participant

Participants who mixed energy drinks with alcohol self-reported consuming significantly more alcohol than those who consumed alcohol alone (z-9.2897, $p<0.001$), were significantly more likely to report pre-drinking ($\chi^2=81.908$, $p<0.001$) and were significantly more likely to report illicit drug use ($\chi^2=41.528$, $p<0.001$) compared with those who had not consumed energy drinks. Table 5 presents BAC readings according to energy drink consumption behaviours.

Table 5 BAC readings by energy drink consumption behaviours

Variable	BAC Median (range)
Consumed energy drinks	
Yes (n=1,483)	0.063 (0–0.35)
No (n=5,073)	0.051 (0–0.34)
Mix energy drinks with alcohol	
Yes (n=971)	0.072 (0–0.35)
No (n=512)	0.040 (0–0.29)
Number energy drinks consumed	
≤1 (n=720)	0.057 (0–0.25)
1.5-2 (n=328)	0.063 (0–0.29)
2.5-3 (n=150)	0.077 (0–0.29)
3.5-4 (n=97)	0.063 (0–0.34)
5+ (n=130)	0.074 (0–0.23)
TOTAL (N=6,557)*	0.054 (0–0.35)

*No BAC data for 247 participants

Figure 3 Mean energy drink consumption per hour across all sites

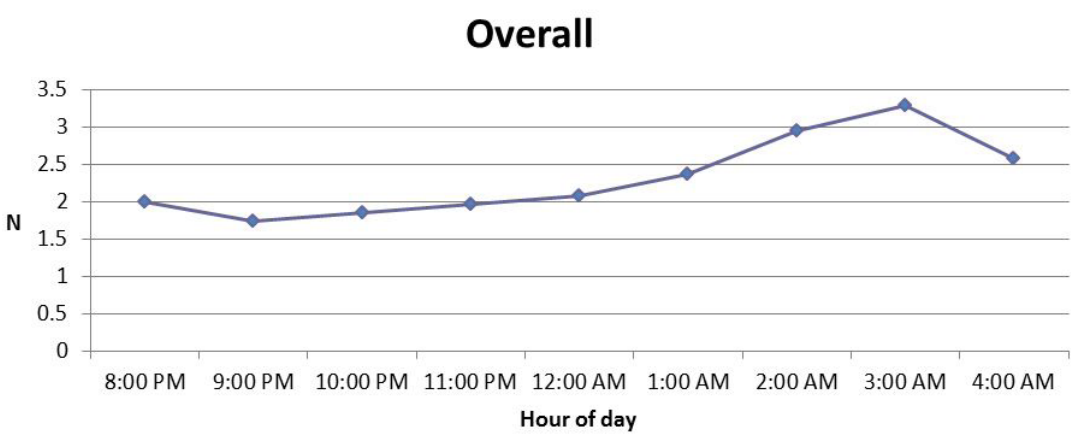


Figure 3 and Figure 4 report the mean number of energy drinks consumed by interviewees overall and across all sites respectively, showing remarkable consistency with a peak in consumption around 2-3 am of around 3 standard energy drinks.

Figure 4 Mean energy drinks consumed for each city by hour of day

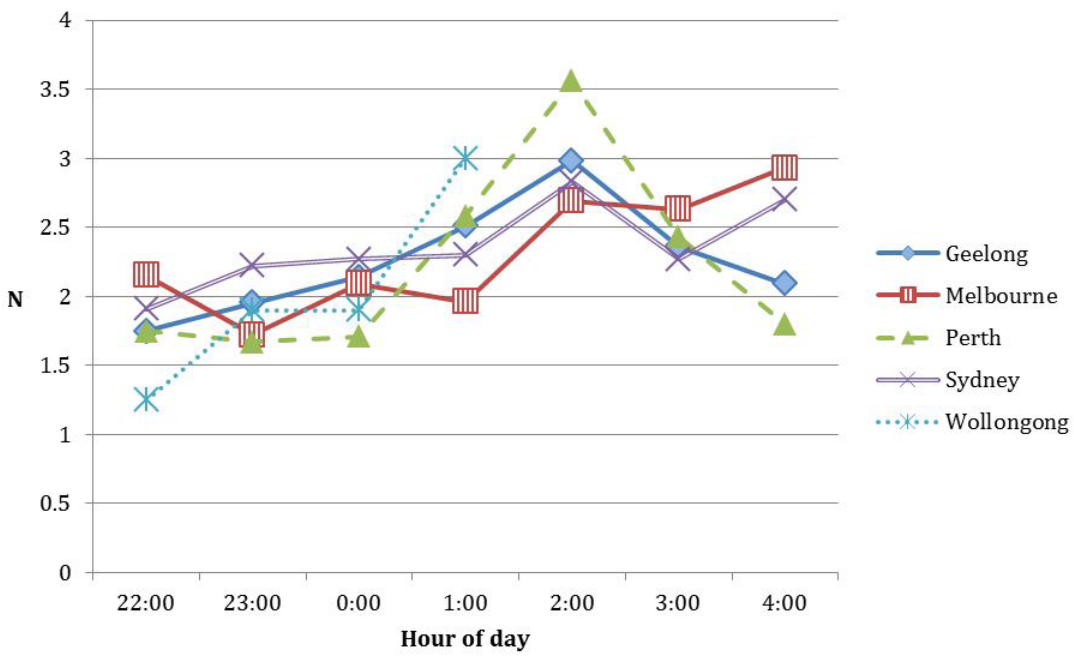
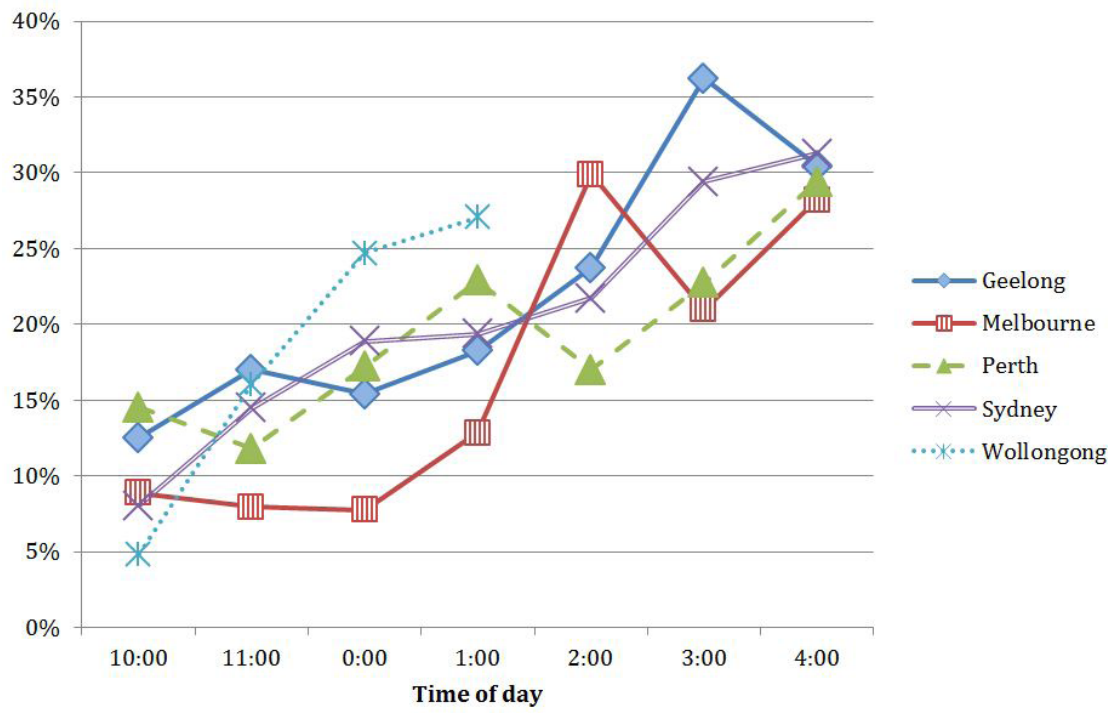


Figure 5 reports the percentage of interviewees who reported having consumed alcohol mixed with energy drinks for each city across the night. As with energy drink consumption alone, the trends are remarkably similar for all of the cities. Surprisingly, despite a ban on serving energy drinks with alcohol after midnight in Perth, consumption patterns in Perth were similar to other cities.

Figure 5 Percentage of interviewees consuming AED for each city by hour of day



Motivations for combining energy drinks and alcohol included liking the taste of the combined drinks (32%), providing energy to stay awake/party longer (24%). People who reported consuming energy drinks were also more likely to experience any form of aggression and injury in the past three months than those who had not (χ^2=41.10, p=0.000; Table 6).

Table 6 Energy drink use and experience of harm in past three months

	Consumed energy drinks tonight (%)			
TOTAL (N=6,803)	Yes n=1,536	No n=5,267	Chi-square	p
Any aggression around licensed venues last three months?	342	806	41.01	0.000
—physical aggression	226	502	33.42	0.000
—verbal aggression	189	436	23.11	0.000
—sexual aggression	36	87	3.21	0.073
Any accident/injury past three months	281	626	39.498	0.000

Finally, people who had consumed energy drinks on the night of interview were also more likely to report having driven while drunk (χ^2=5.51, p=0.019) or having committed property crime (χ^2=5.51, p=0.019) while intoxicated in the past three months, than those who had not consumed energy drinks. Overall, 23% of those who had consumed energy drinks reported drink driving compared to 18.6 percent of those who had not.

Other Substance Use

Around one in six (n=1072, 16%) of the overall sample reported use of substances other than alcohol during their current night out prior to interview (see Table 7).

Table 7 Self-reported use of substances other than alcohol during current night out (prior to interview) among entire sample, by city/interview location

Drug	TOTAL N=6,804 n (%)	Geelong N=1,262 n (%)	Melbourne N=1,927 n (%)	Perth N=1,244 n (%)	Sydney N=1,560 n (%)	Wollongong N=730 n (%)
Ecstasy	231 (3)	58 (5)	36 (2)	13 (1)	101 (6)	18 (2)
Cocaine	97 (1)	13 (1)	33 (2)	15 (1)	24 (2)	10 (1)
Methamphetamine*	179 (3)	52 (4)	64 (3)	16 (1)	39 (3)	7 (1)
Pharmaceutical stimulants**	30 (<1)	7 (1)	3 (<1)	12 (1)	6 (<1)	2 (<1)
Ketamine	5 (<1)	3 (<1)	0 (0)	0 (0)	2 (<1)	0 (0)
Benzodiazepines	8 (<1)	3 (<1)	4 (<1)	0 (0)	1 (<1)	0 (0)
GHB	8 (<1)	2 (<1)	1 (<1)	1 (<1)	3 (<1)	1 (<1)
LSD	15 (<1)	1 (<1)	6 (<1)	3 (<1)	5 (<1)	0 (0)
Cannabis	196 (3)	37 (3)	68 (4)	29 (3)	48 (3)	14 (2)
Opiates***	10 (<1)	5 (<1)	3 (<1)	1 (<1)	1 (<1)	0 (0)
Mephedrone	6 (<1)	3 (<1)	0 (0)	3 (<1)	0 (0)	0 (0)
Other****	32 (1)	5 (<1)	10 (1)	4 (<1)	0 (0)	4 (1)
ANY	1,072 (16)	318 (25)	272 (14)	166 (13)	214 (14)	89 (12)

*Refers primarily to speed powder, crystal methamphetamine/'ice', amphetamine liquid, and methamphetamine base

**Includes: dexamphetamine and ritalin

***Includes: heroin, morphine, endone, codeine

****Includes: nitrous oxide ('gas'), 'magic mushrooms' and other pharmaceuticals (eg, over-the-counter painkillers)

Five hundred and three participants in Melbourne and Geelong were invited to be tested for the use of meth/amphetamine, cocaine, opiates, cannabis and benzodiazepines, via drug swab. The majority of these respondents (n=401, 80%) agreed to the test. Table 8 lists the prevalence of positive drug test findings for these respondents.

Table 8 Positive drug swab test results by sex and city/interview location

		Participant sex		City/interview site	
Drug	TOTAL N=401 n (%)	M N=285* n (%)	F N=116* n (%)	Geelong N=170*	Melbourne N=229*
Methamphetamine**	61 (15)	44 (16)	16 (14)	29 (17)	32 (14)
Cocaine	14 (3)	10 (4)	3 (3)	4 (2)	10 (4)
Opiates	0 (0)	–	–	–	–
Cannabis	21 (5)	14 (5)	7 (6)	7 (4)	14 (6)
Benzodiazepines	3 (1)	2 (1)	1 (1)	0 (0)	3 (1)
ANY	80 (20)	55 (19)	23 (20)	36 (21)	44 (19)

*Missing gender data for three participants and missing location data for two participants who completed a drug test

** It should be noted that mouth swabs do not identify MDMA as being distinct from other amphetamine-type substances without further testing

Table 9 presents the self-report responses of participants regarding use of illicit drugs prior to interview according to positive drug swab results. Overall, 50% (n=44) of participants who reported prior consumption of meth/amphetamine, cocaine, opiates, cannabis and benzodiazepines and who were drug swabbed did not return a positive drug swab result.

Table 9 Self-report versus drug swab results of pre-interview drug use

Pre-interview drug use	Self report Yes/No	Drug swab: Positive test result n (%)
Meth/amphetamine	Y (n=67)	35 (52)
	N (n=332)	26 (8)
Cocaine	Y (n=23)	6 (26)
	N (n=376)	8 (2)
Opiates	Y (n=3)	0 (0)
	N (n=396)	396 (100)
Cannabis	Y (n=57)	9 (16)
	N (n=342)	12 (4)
Benzodiazepines	Y (n=2)	0 (0)
	N (n=397)	3 (1)
ANY (of five drug types)	Y (n=88)	44 (50)
	N (n=313)	36 (12)

Table 10 shows that people who report illicit drug use are significantly more likely to report having engaged in aggressive and offending behaviour as well as experiencing more harm in terms of injury or accidents.

Table 10 Use of illicit drugs and reported aggressive and offending behaviour in the past three months

	Illicit drug use					
	Yes		No		Chi-square	p
	N	%	n	%		
TOTAL	524		3,303			
Involved in any aggression around licensed venues last three months?	244	22.8	891	15.7	37.6	0.000
Physical aggression	172	16	546	9.6	45.95	0.000
Verbal aggression	132	12.3	486	8.5	18.33	0.000
Sexual aggression	31	2.9	90	1.6	10.863	0.012
Property Crime	37	7.1	122	3.7	13.39	0.004
Drink-driving	413	24.1	132	12.3	62.396	0.000
Any alcohol-related injury	197	18.7	703	13.1	23.55	0000

Aggression and Other Risk Behaviours

Participants were asked about their experience of aggression and other risk behaviours in the past three months. A minority (n=1148, 17%) of the entire sample reported that they had been involved in any form of verbal, physical or sexual aggression in or around licensed venues in the three months prior to interview. Table 11 lists the prevalence of each type of aggression among the whole sample, according to sex and city/interview location. Male respondents were significantly more likely to report involvement in any type of aggression than female participants (χ^2=19.28, p<0.001; Table 11).

Table 11 Self-reported involvement in aggression in the last three months, by sex, age and city/interview site

	Aggression type			
Variable	ANY n (%)	Verbal n (%)	Physical n (%)	Sexual n (%)
Sex				
Male (n=4,112)	769 (19)	405 (10)	531 (13)	66 (2)
Female (n=2,566)	375 (14)	218 (9)	194 (8)	56 (2)
City/interview site				
Geelong (n=1,255)	283 (22)	179 (14)	204 (16)	37 (3)
Melbourne (n=1,905)	272 (14)	149 (8)	146 (8)	25 (1)
Perth (n=1,214)	193 (16)	65 (5)	111 (9)	17 (1)
Sydney (n=1,536)	302 (19)	165 (11)	203 (13)	33 (1.2)
Wollongong (n=729)	80 (11)	56 (7.7)	52 (7.1)	9 (1)
Age group				
18–19 (n=1,586)	344 (21)	172 (11)	233 (15)	32 (2)
20–24 (n=2,799)	569 (20)	325 (12)	369 (13)	61 (2)
25–29 (n=1,333)	153 (11)	83 (6)	83 (6)	19 (1)
30–39 (n=696)	59 (8)	29 (4)	31 (4)	10 (1)
40+ (n=230)	16 (7)	13 (6)	7 (3)	0 (0)
TOTAL (N=6,804)	2,073 (49)	1,468 (35)	1,663 (39)	239 (6)

The majority (n=392, 88%) of participants who commented on whether alcohol had been consumed prior to their last aggressive episode reported that alcohol use had occurred. The median number of standard drinks consumed on this occasion was 9 (range: 1-45). Only fifty five people (9%) reported that illicit drugs had been consumed the last time they had been involved in aggressive behaviours. The most common illicit substances reportedly consumed by these participants were ecstasy (n=18, 33%) and methamphetamine (n=16, 29%).

Of the entire sample, 14% reported incurring or causing any alcohol-related accidents or injuries in the past three months; female participants were significantly more likely to report this than male participants (χ^2=5.51, p=0.019: see Table 12). Four percent of the sample reported causing property damage while alcohol-intoxicated in the past three months (with male respondents significantly more likely to do so; χ^2=16.47, p<0.001). Fourteen percent of the sample reported having driven under the influence of alcohol in the three months prior to interview (with male participants more likely to do so; p<0.001). Eighteen percent of participants reported having been refused service/entry or been ejected from a licensed venue due to intoxication in the last three months (with male participants significantly more likely to have been; χ^2=93.23, p<0.001).

Table 12 Experience of alcohol-related harms and involvement in risk behaviours last three months, by sex and city/interview location

		Participant sex		City/interview site				
	TOTAL N=6,454 n (%)	Male N=3,970† n (%)	Female N=2,464† n (%)	Geelong N=1,213 n (%)	Melbourne N=1,831 n (%)	Perth N=1,243 n (%)	Sydney N=1,392 n (%)	Wollongong N=705 n (%)
Incurred or caused any alcohol-related accidents or injuries last three months	907 (14)	526 (13)	378 (15)	205 (17)	223 (12)	178 (14)	179 (13)	110 (16)
More than one month ago*	216 (24)	129 (25)	87 (23)	27 (13)	59 (26)	51 (29)	40 (22)	38 (35)
In the last month*	214 (24)	131 (25)	82 (22)	41 (20)	68 (30)	44 (25)	38 (21)	21 (19)
In the last fortnight*	114 (13)	71 (14)	43 (11)	42 (20)	22 (10)	28 (16)	14 (8)	6 (5)
In the last week*	221 (24)	115 (22)	105 (28)	60 (30)	47 (21)	43 (24)	42 (23)	22 (20)
Tonight*	48 (5)	25 (5)	22 (6)	19 (9)	7 (3)	7 (4)	13 (7)	2 (2)
Unspecified timeframe*	94 (10)	55 (10)	39 (10)	16 (8)	20 (9)	5 (3)	32 (18)	21 (19)
Caused any property damage while alcohol-intoxicated last three months	n=3,838** 159 (4)	n=2,240¥ 118 (5)	n=1,576¥ 41 (3)	n=257 23 (9)	n=1,527 60 (4)	n=424 9 (2)	n=907 27 (3)	n=697 39 (6)
More than one month ago***	44 (28)	28 (24)	16 (39)	4 (17)	16 (27)	3 (33)	9 (33)	12 (31)
In the last month***	41 (26)	28 (24)	13 (32)	4 (17)	17 (28)	2 (22)	10 (37)	8 (21)
In the last fortnight***	27 (17)	23 (19)	4 (10)	7 (30)	8 (13)	2 (22)	3 (11)	7 (18)
In the last week***	33 (21)	25 (21)	8 (20)	5 (22)	13 (22)	2 (22)	5 (19)	8 (21)
Tonight***	9 (6)	9 (8)	0 (0)	3 (13)	5 (8)	0 (0)	0 (0)	0 (0)
Unspecified timeframe***	5 (3)	5 (4)	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)	4 (10)
Driven under the influence of alcohol last three months	n=3,895** 547 (14)	n=2,262 380 (17)	n=1,606 162 (10)	n=263 48 (18)	n=1,543 240 (16)	n=424 55 (13)	n=940 100 (11)	n=698 102 (15)

Table 12 (continued)

	TOTAL N=6,454 n (%)	Participant sex: Male N=3,970† n (%)	Participant sex: Female N=2,464† n (%)	City/interview site: Geelong N=1,213 n (%)	City/interview site: Melbourne N=1,831 n (%)	City/interview site: Perth N=1,243 n (%)	City/interview site: Sydney N=1,392 n (%)	City/interview site: Wollongong N=705 n (%)
More than one month ago***	132 (24)	94 (25)	35 (22)	14 (29)	63 (26)	8 (15)	26 (26)	21 (21)
In the last month***	149 (27)	99 (26)	49 (30)	11 (23)	61 (25)	16 (29)	27 (27)	33 (32)
In the last fortnight***	62 (11)	39 (10)	23 (14)	5 (10)	26 (11)	7 (13)	13 (13)	11 (11)
In the last week***	149 (27)	104 (27)	44 (27)	9 (19)	71 (30)	17 (31)	24 (24)	26 (25)
Tonight***	38 (7)	33 (9)	4 (2)	8 (17)	14 (6)	7 (13)	6 (6)	3 (3)
Unspecified timeframe***	18 (3)	11 (3)	7 (4)	1 (2)	5 (2)	0 (0)	4 (4)	8 (8)
Refused service/entry or kicked out of licensed venue due to intoxication last three months	n=3,931** 724 (18)	n=2,296 536 (23)	n=1,608 180 (11)	n=266 46 (17)	n=1,556 264 (17)	n=424 62 (15)	n=963 208 (21)	n=697 140 (20)
If yes, median (range)	1 (1–50)	1 (1–50)	1 (1–20)	1 (1–10)	1 (1–27)	1 (1–10)	1 (1–50)	2 (1–20)

*Of those who had incurred/caused alcohol-related injuries in the last three months

**Question only asked of participants of the full interview

***Of those who reported causing any property damage last three months

Summary of trends

The patron interview study was successfully carried out across all sites, resulting in the largest sample of people attending licensed venues ever interviewed (n=6804). No safety incidents were recorded, demonstrating the methods and training undertaken were both effective and safe. A high response rate of 90.2% was achieved across all sites, suggesting that the sample accessed was representative of most of the people who normally go out in Australian night-time entertainment districts (NEDs). Overall, the findings of this study show striking similarities across the sites studied and the many thousands of people interviewed. General levels of intoxication are moderate across the evening, however there is a consistent trend across the cities of escalating intoxication throughout the night and larger cities show high to very high levels of intoxication after 1am. The use of energy drinks and illicit drugs were both significantly associated with increased experience of aggression and injury, however pre-drinking before going out remained the strongest predictor of harm and intoxication.

Venue Observations

Sessions of observation were undertaken in all cities fortnightly on a Friday or Saturday night (on the alternate weekend to interviews). Teams of two or three observers spent four to five hours within specified licensed venues. Major venues in entertainment districts were selected to cover all venues in smaller cities (Perth, Geelong, Wollongong) and within specified entertainment districts in Melbourne and Sydney.

A range of venues in each city was selected for sessions of observation. Venues were selected and classified based on opening times and size. Three types of venues were selected:

- Large mainstream pub – closing time between 1-3 am
- Bars – closing time between 1-5 am
- Nightclubs (DJ focused) – closing time between 3 am to 24 hour trading.

A total of 68 unique venues were observed during the data collection period between Dec 2011 and July 2012.

Results

Table 13 (below) displays the total frequency of observations across all research sites. Each hourly venue observation collected summary information including total numbers of patrons in venue at time of observation, estimated percentage of venue patron capacity, percentage of patrons who were male, and percentage of patrons who appear under 25.

Table 13 Venue classification vs. patron descriptors by hour

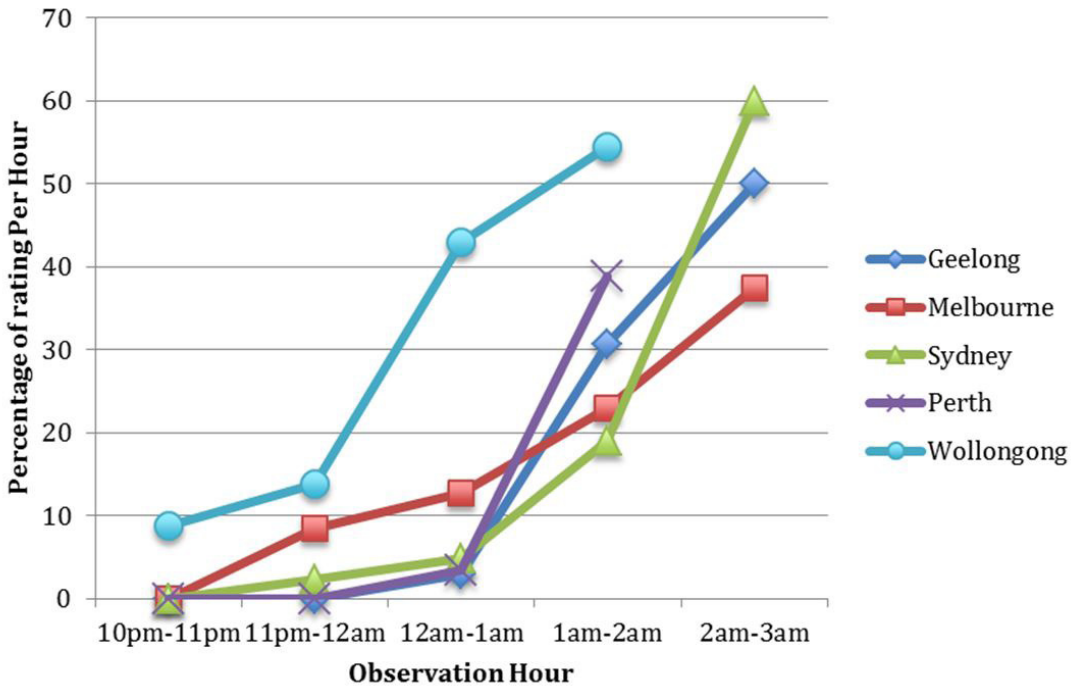
Descriptor	Large mainstream pub	Bar	Nightclub
Mean number of total venue patrons			
10–11 pm	268	145	136
11 pm–12 am	316	210	204
12–1 am	290	202	328
1–2 am	314	175	379
2–3 am	187	152	254
Mean percentage of venue capacity (%)			
10–11 pm	55.94	39.70	28.21
11 pm–12 am	51.25	55.82	44.44
12–1 am	53.65	54.11	59.02
1–2 am	46.85	50.11	66.26
2–3 am	43.00	53.14	51.86
Mean percentage of male patrons (%)			
10 –11 pm	59.66	58.16	56.94
11 pm–12 am	56.11	59.78	56.18
12–1 am	58.93	57.95	56.25
1–2 am	62.50	58.26	56.35
2–3 am	71.50	62.76	58.45
Mean percentage of patrons <25yrs			
10–11 pm	56.36	48.16	59.44
11 pm–12 am	57.14	51.70	64.42
12–1 am	54.78	48.41	69.27
1–2 am	54.96	50.44	63.71
2–3 am	63.20	39.72	62.39

Mainstream pub and bar venues typically experienced peak patronage earlier than nightclub type venues, although most had a sustained peak across several hours. For all venue types, males represented the majority of patrons at all hours of venue observation. Patron age also fluctuated differently according to venue type. At mainstream pubs and nightclub type venues, patrons aged under 25 years represented the majority of attendants at all times of the night.

Patron Intoxication

Figure 6 reports observers' ratings of high patron intoxication over time in each site. Observers were asked to allocate an overall rating of patron intoxication within venues during observation; low, medium, high or no visible signs of intoxication. Consistent trends of increasing intoxication during later hours are visible for all observation sites. Prior to 1 am, "high" patron intoxication occurred on less than 15% of observations across all sites, with the exception of Wollongong, which reaches equivalent levels of moderate/high intoxication one hour earlier than other sites.

Figure 6 Patron intoxication trends by hour: high visible intoxication



All available measures of patron intoxication increased over time across all venue types. By 2 am, the average proportion of patrons exhibiting any intoxication sign was between 71 percent and 75 percent, while between 10 percent and 25 percent appeared too intoxicated to remain in the venue. These rates were consistent across all venue types.

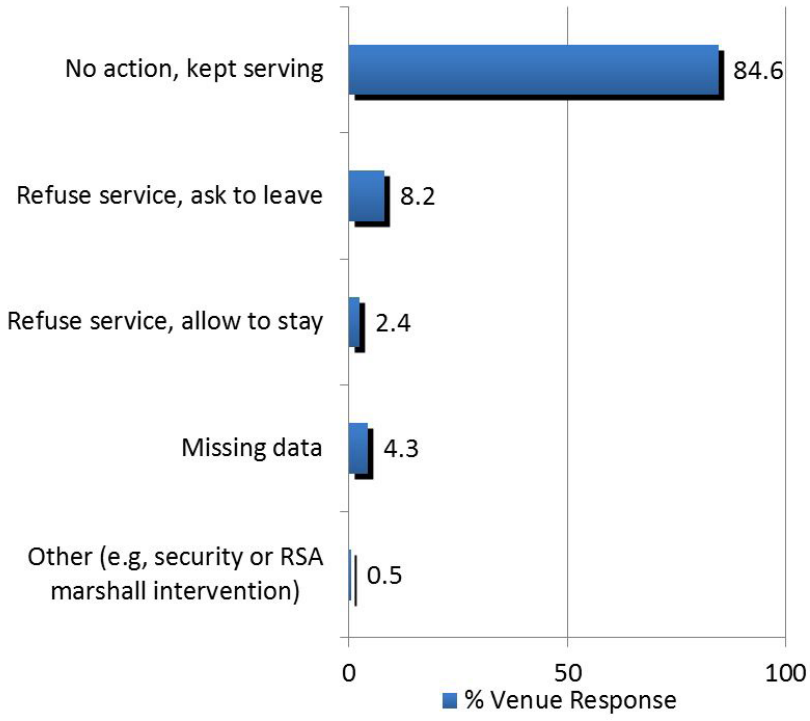
Rates of patrons showing signs of illicit substance use also increased by hour, across all venue types. However, nightclub type venues saw a substantially higher proportion of patrons exhibiting signs of illicit drug use.

Table 14 Venue classification vs. patron intoxication indicators per hour

Descriptor	Large mainstream pub	Bar	Nightclub
Mean percentage of patrons showing any intoxication (%)			
10–11 pm	42.20	31.71	22.30
11pm–12 am	52.62	52.09	42.14
12–1 am	59.49	61.11	55.71
1–2 am	72.13	63.72	70.99
2–3 am	75.30	71.08	74.88
Mean percentage of patrons too intoxicated to remain in the venue (%)			
10–11 pm	1.91	1.23	1.23
11–12 am	4.46	4.00	2
12–1 am	9.97	5.70	6.31
1–2 am	8.96	6.96	11.46
2–3 am	25	10.34	16.18
Mean percentage of patrons showing signs of illicit drug use (%)			
10–11 pm	1.32	0.60	2.11
11–12 am	1.21	0.42	3.03
12–1 am	3.16	2.53	8.34
1–2 am	1	1.39	11.09
2–3 am	5	6.26	21.58

Observers were also required to monitor the drinking behaviour of highly intoxicated patrons (Figure 7). For the overwhelming majority of instances, highly intoxicated patrons were served alcohol as usual.

Figure 7 Distribution of venue responses to intoxicated patron's ordering drinks



Alcohol and Energy Drink Use.

Observers reported witnessing patrons consuming alcoholic energy drinks (AED's) during n=254 hourly observations (28.3%). AEDs were reported as a popular/main drink of choice during 181 hourly observations (20.2%). Table 15 reports levels of observed patron intoxication according to whether AED's were observed as a common drink. Venue patrons were significantly more likely to demonstrate moderate or high levels of intoxication if AEDs were recorded as being popular amongst patrons (χ^2 (3,872) = 28.036, p= 0.000).

Table 15 Distribution of patron intoxication across AED use popularity (n= 872)

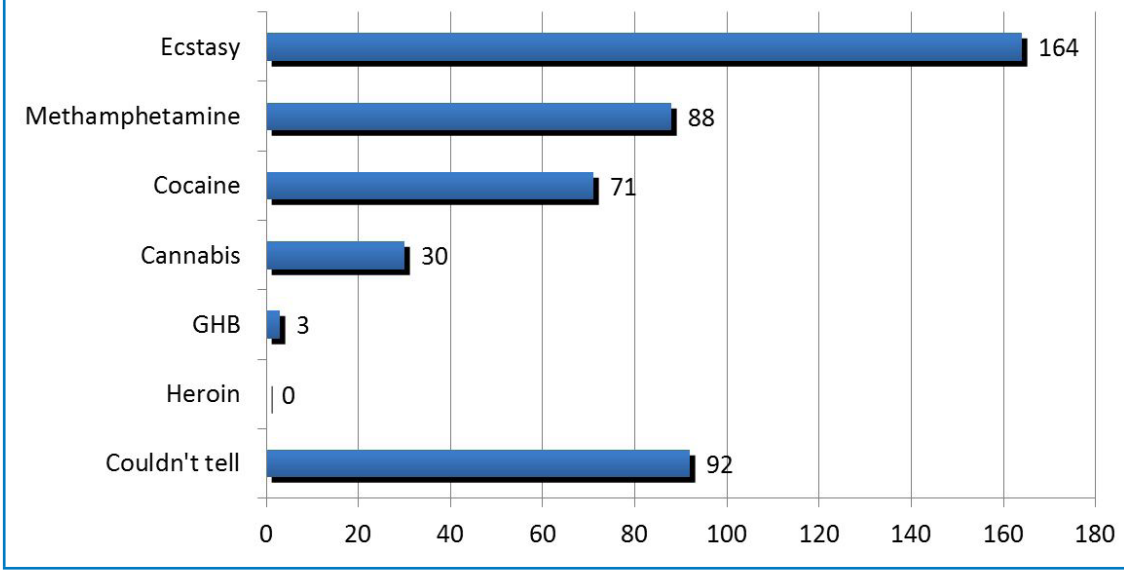
	Popular AED use?	
Patron intoxication rating (%)	No (n=717)	Yes (n=181)
Overall, no sign of intoxication	92.3	7.7
Slight signs of intoxication	87.3	12.7
Moderate signs of intoxication	75.1	24.9
High levels of intoxication	72.7	27.3

Illicit Substance Use

Observers were asked to record suspected illicit substance use during each hourly observation record. In total, n=200 hourly records (22.2% of all observations) indicated some patron intoxication from illicit substances. Geelong, Melbourne and Sydney saw similar frequencies of suspected substance use, ranging from 28 percent to 31 percent. In comparison, Wollongong and Perth saw relatively low frequencies of suspected illicit drug use, where Wollongong recorded eight percent of total observations and Perth recorded six percent. The proportion of patrons showing illicit substance intoxication increased over the course of the night, and was higher overall in nightclub type venues.

Figure 8 demonstrates the frequency of specific illicit substance suspected of being used in observed venues. Stimulant drugs such as ecstasy, methamphetamine and cocaine were the most frequently suspected substances used in licensed venues, followed by cannabis and GHB.

Figure 8 Total 'n' of suspected observations for illicit substance use



Only 36 physical, sexual or verbal incidents were witnessed from 898 hours of field observations, indicating that in-venue incidents are relatively rare. Most incidents were observed in Sydney, although five of the 14

physical incidents were observed in Perth. Physical incidents were more likely to occur in clubs and pubs, with sexual and verbal incidents more likely to occur in bars. Most incidents occurred between midnight and 2 am and occurred among people who appeared heavily intoxicated from alcohol. Physical and verbal incidents occurred mostly among males in their twenties and sexual incidents involved men and women in their twenties. Incidents were most likely to occur in busy areas such as the dance floor, the bar and the venue entrance. Incidents involving males were most commonly caused by strangers accidentally bumping into one another, while women were more likely to be involved in incidents with people they knew. It was generally noted that security handled incidents efficiently when they intervened.

Discussion

This study provides unprecedented insight into the nightlife of five Australian cities and allows substantial insight into the behaviour patterns of people in NEDs across Australia. Overall, alcohol remains the driver of most harm in the NTE, and while such harm is not very common, most people experience it in some form eventually. There was striking similarities across the five sites and most of the variables of interest. Levels of intoxication, energy drink use and mixed alcohol/energy drink use increased linearly throughout the night. These findings reinforce the very large body of research that shows a relationship between later trading and greater levels of intoxication and harm (Babor, et al. 2010; Chikritzhs & Stockwell, 2002; Miller, et al. 2011b).

Intoxication resulting from pre-drinking is consistently the strongest predictor of trouble for individuals in our sample. Alarmingly, most patrons attending the NTE exhibit this behaviour. Those who pre-drink may seldom come into contact with bar staff, or will order water when they do, meaning that their levels of intoxication can be difficult to monitor through regular staff interactions. Calls for improved intoxication screening practices are valid, but while refusing entry to highly intoxicated patrons may remove harm from specific venues, it will do little to reduce the prevalence of overall violence in NTEs given that most alcohol related assaults occur outside venues. Most pre-drinkers are motivated by price discrepancies between packaged and on-premises alcohol, therefore pre-drinking behaviour represents a unique policy challenge for those seeking to reduce alcohol-related harm.

The use of energy drink and AED in the night-time economy was also found to be associated with an increased risk of harm. Consistent with limited international research, around 15 percent of night-time revellers consumed AEDs, and they were more likely to be younger patrons. AED consumers were more likely to have a higher BAC reading, to pre-drink and use illicit drugs, and to have engaged in risky behaviour in the past three months, including involvement in a fight or drink-driving. Importantly, rates of energy drink and AED use increased through the night to mean levels beyond the recommended intake for healthy consumption. This suggests the need for substantial action including research into the effects of such high levels of use, the effectiveness of labelling to warn against such use, the relevance of educational campaigns, and the need for legislative action.

Illicit drug use was common in the cities studied and had a significant effect on intoxication, offending, risk and harm in the night-time economy. While only a minority of participants reported that illicit drugs had been consumed the last time they had been involved in aggressive behaviour, associations were found between self-reported use of illicit drugs on the night of interview and reported aggressive and offending behaviour in the three months prior to interview. People who reported illicit drug use on the night of interview were significantly more likely to report having engaged in physical, verbal and sexual aggression, as well as property crime and drink driving. Self-reported illicit drug use was also associated with experiencing an injury related to intoxication during that time. Overall, the study has shown that illicit drug use is a significant contributing factor to the harms observed in the night-time economy, but that only a minority of patrons use drugs. Despite this, it is clear that a program of research interventions and policy responses is needed to address the issue. Previous research has shown a combination of supply, demand and harm reduction approaches is most likely to be effective.

Study Limitations

Although portal or patron interviews have substantial benefits in terms of investigating people who visit NTE districts, a number of limitations should be noted. Firstly, such surveys do not represent all people who attend licensed venues. Secondly, as potential participants are in the middle of a night out, interviews are necessarily kept short and are not suitable for in-depth questions. Thirdly, such interviews were conducted within a comparatively public environment, and therefore were not highly personal. Finally, there was no way to ensure participants were telling the truth.

It is also important to consider the limitations with using covert observations to measure venue patron behaviour. Each venue was typically observed for four or five hours, thus some practices may not have been observed because they occurred after observers had left the venue. These limitations were minimised by observing the venues on multiple occasions, and staggering the times of observation for each venue across the study period.

Conclusion

As the largest study conducted in the night-time economy to date, this research shows that alcohol remains a significant contributor to patron offending and intoxication in the night-time economy. Pre-drinking, energy drink use and illicit drug use all contribute significantly to the harm and offending behaviour observed, however basic levels of intoxication and pre-drinking remain the major predictors of offending and harm.

Key findings and directions for policy, practice and research

There are a number of key findings are presented below with some possible directions for policy, practice or research.

FINDING 1: This research shows that levels of intoxication increased throughout the night across the five sites, resulting in a substantial proportion of the people in the NTE being heavily intoxicated, especially after 1am when 30% of the people interviewed across the country were above 0.1 BAC.

Proposal 1a: Current regulatory and enforcement frameworks require further refinement and investment. In particular, Responsible Service of Alcohol (RSA) measures are evidently insufficient and require more stringent regulation and more comprehensive and systematic enforcement regimes.

Proposal 1b: Australian jurisdictions should consider imposing trading hour restrictions, applied consistently across regions to ensure businesses can compete on a level playing field.

Proposal 1c: An intervention trial prohibiting the sale of alcohol for 60 minutes before closing time is recommended in venues which trade after 2am.

Proposal 1d: A program of research is recommended around the best models of regulation and monitoring of licensing regulations. Consideration should be directed at an integrated strategy with a clearly-defined enforcement pyramid.

FINDING 2: This research has identified pre-drinking as a significant predictor of alcohol-related harm and a major impediment to responsible service of alcohol. This behaviour reflects Australia's culture of determined drunkenness, and requires serious, substantial, evidence-based interventions across a range of variable (eg price, availability and advertising)

Proposal 2a: The most evidence-based measure to reduce alcohol consumption is to increase the price of alcohol through taxation (preferably based on volume and increasing according to beverage strength). This could also be ring-fenced to allow for specific expenditure on measures that ameliorate harm.

Proposal 2b: Regulatory measures should be implemented to reduce discount alcohol sales . In particular, bans on bulk-buys, two-for-one offers and other promotions based on price, deserve consideration as policy responses that could reduce heavy episodic drinking. Further, some states have regulations pertaining to discounting which should be more strictly enforced both on and off license venues.

Proposal 2c: State and local governments should investigate levies on each unit of alcohol sold by packaged liquor outlets to recover costs associated with alcohol. Tthis money would be allocated to police, hospitals and councils to meet the costs of alcohol-related harm.

Proposal 2d: For every alcohol advertisement, a government-produced public health advertisement should immediately follow (funded via a levy on all sales by alcohol producers) informing the public of the harms associated with drinking, and addressing social norms around intoxication.

FINDING 3: As a part of the pre-drinking culture, people were often observed by the research teams consuming alcohol near licensed venues just prior to entering.

Proposal 3a: A review of security training regarding identification of intoxicated people is recommended. A potential amendment could be training in field sobriety testing and the requirement for at least one staff member from each venue to have additional qualifications in this area. Such an intervention should be scientifically evaluated before implementation.

Proposal 3b: Further research and intervention trials should be undertaken to identify methods to reduce levels of pre-drinking in night-time entertainment districts. A number of avenues are described below:

- *Police and councils should trial interventions to address drinking in cars and taxis, even when stationary. Council by-laws or State laws should both be investigated.*
- *A potential alternative to further stretching police resources is to use specially hired and trained council officers to enforce such by-laws and they could also address the issue of open alcohol containers in many night-time entertainment districts.*

FINDING 4: Further research into energy drink use is strongly recommended to validate and expand upon current findings. Any energy drink use was found to be associated with increased experience of harm and alcohol consumption in the NTE. Energy drink use was found to exceed recommended daily intake at 11pm across most sites. Further, despite restriction on the sale of mixed alcohol-energy drinks after midnight in Perth, the levels of consumption of all variants remained similar to all other sites.

Proposal 4a: Policy trials of banning energy drink sales after 10pm are suggested.

Proposal 4b: Discounts and promotions on AEDs should be banned in all venues.

Proposal 4c: Posters should displaying information about the maximum number of energy drinks that should be consumed daily and the potential risks associated with combining alcohol and energy drinks be distributed to all venues for placement behind the bar and in the toilets.

Proposal 4d: Public education campaigns should be trialled about the potential dangers of mixing alcohol and energy drinks.

FINDING 5: Illicit drug use was found at all sites and drug use was found to significantly predict people experiencing greater violence and injury.

Proposal 5a: Funded trials of interventions such as the 'clubs against drugs' program (Gripenberg Abdon, et al. 2011) are recommended.

Proposal 5b: Implementing harm reduction measures such as pill testing kits and posters in venues warning of the harms of combining alcohol and illicit drugs in night-time entertainment districts, should be considered. Venues identified as having a lot of drug use could be subject to conditions to remove flat surfaces in toilets and having their security increase surveillance of toilet areas..

FINDING 6: Almost half of the people who self-reported illicit drug use produced false negative results (i.e. drug use was not found by the test).

Proposal 6a: Further research into the utility of drug testing devices for venue patrons is required for future.

FINDING 7: Half of those surveyed reported that they were going to get a taxi home, indicating that focusing upon late night transport infrastructure would ensure that highly intoxicated patrons left NTEs as quickly as possible.

Proposal 7a: Further tailoring of and research into transportation solutions for night-time entertainment districts is strongly recommended.

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