



That's entertainment: Trends in late-night assaults and acute alcohol illness in Sydney's Entertainment Precinct

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Aim: To assess the role of administrative police and health databases in monitoring trends in, and epidemiology of, alcohol-related violence and acute alcohol illness associated with the night time economy in the Sydney central business district (CBD) "Entertainment Precinct", prior to the introduction of 2014 government reforms addressing "alcohol-fuelled violence".

Method: We examined annual trends in police-recorded incidents of grievous bodily harm, ambulance Triple Zero (000) calls for assault, and acute alcohol illness emergency department presentations that occurred between 10 p.m. and 6 a.m. over a 10-year period (2004–2013). Trends were examined among persons of all ages and young adults (18 to 29 year olds) in the CBD. The rest of metropolitan Sydney provided a comparison area to evaluate whether trends were CBD-specific.

Results: Among persons of all ages, there were 913 police-recorded incidents of grievous bodily harm, 10,427 ambulance calls for assault and 14,106 emergency department presentations for acute alcohol illness in the CBD over the 10-year period. Young adults accounted for between 62 per cent and 78 per cent of assault incidents and 58 per cent of alcohol emergency department presentations. Between 2004 and 2008, the annual number of assaults and acute alcohol illness increased two-fold. Alcohol illness emergency department presentation trends subsequently stabilised, while assaults in 2013 were at the lowest levels in 10 years. Similar trends were observed in the rest of metropolitan Sydney.

Conclusion: The majority of alcohol-related assaults and emergency department presentations involved young adults. Ambulance and police administrative data sources provided a consistent picture of a recent decline in late-night assault trends. Alcohol-related emergency department presentation trends suggested other alcohol harms may be continuing at relatively high levels both in the CBD and in metropolitan Sydney. While violence appears to be declining in the CBD and across Sydney, continuing alcohol harm remains to be addressed.

Keywords: administrative databases, alcohol, assault, emergency services, health, Sydney, young adults

INTRODUCTION

Alcohol-related violence has long been an issue of public concern in Australia, particularly in recent years in NSW following a number of fatalities from "coward punches" (a single punch to the head knocking someone out or down). While the relationship between alcohol and violence is complex, a high blood alcohol concentration level is a risk factor for violence. Australian research suggests that alcohol is a factor in 23–73 per cent of assaults (Briscoe & Donnelly, 2001; Doherty & Roche, 2003; Poynton, Donnelly, Weatherburn, Fulde, & Scott, 2005), and that rates for harmful drinking behaviours and involvement

in alcohol-related violence are higher in persons aged 18 to 29 years (Australian Institute of Health and Welfare [AIHW], 2014), and in and around licensed premises (Burgess & Moffatt, 2011; Livingston, 2008; Moffatt, Mason, Borzycki, & Weatherburn, 2009).

In 2014, the boundaries of the Sydney CBD Entertainment Precinct (herein referred to as the CBD) were defined in association with urgent reforms targeting alcohol-related violence (NSW Government, 2014a, 2014b; Office of Liquor Gaming and Racing [OLGR], 2014). The CBD contains highly urbanised neighbourhoods and has a thriving "night-time economy" with a

high number of food, drink and entertainment venues in close proximity which have a large patronage including residents and visitors to the city. The 2014 reforms included specific mechanisms to tackle violence, such as management of venues where incidents are concentrated and increased sanctions for offenders, as well as mechanisms that target both violence and excessive alcohol consumption, such as reduced trading hours and limits on the number of drink sales per patron before closing.

It is important to identify data sources that are sufficiently timely and relevant to monitoring and evaluating trends over time. Administrative databases for emergency services are readily available for use by government. In NSW, timely data are routinely collected and reported by police, ambulance and public hospital emergency department services. These databases have previously been used to describe and evaluate alcohol and violence problems in the population (Gale et al., 2015; Kypri, Jones, McElduff, & Barker, 2011; Muscatello, Thackway, Belshaw, & McGrath, 2009) and correlation between time series of police records of violence and of emergency department alcohol presentations has been demonstrated (Descallar, Muscatello, Weatherburn, Chu, & Moffatt, 2012).

Administrative data sources may be influenced by operational factors that make interpretation difficult. For example, police-recorded data may be influenced by changes in factors other than actual crime levels, such as levels of proactive policing or the willingness of the public to report crime. Thus, the reported decline in the number of non-domestic assault incidents in Kings Cross and the CBD, particularly since 2010 (NSW Bureau of Crime Statistics and Research [BOCSAR], 2015) may reflect less willingness of the public to report an assault. While interpretation of trends in administrative data can have limitations, comparing and presenting information from carefully chosen, multiple independent data sources can enhance interpretation and provide a more nuanced picture of the alcohol harm landscape (Langley, Kypri, Cryer, & Davie, 2008; World Health Organisation [WHO], 2000).

In this study, we compare trends in alcohol-related violence and acute alcohol illness associated with the night time economy in the Sydney CBD Entertainment Precinct. Where possible, we also examined trends among young adults who are over-represented among persons with a single drinking occasion risk of harm (AIHW, 2014).

METHOD

SETTING

The Sydney CBD Entertainment Precinct is an area in the City of Sydney local government area approximately 22km² in size with an estimated resident population of 66,200¹ (Australian Bureau of Statistics [ABS], 2011; Figure 1). In 2014, the Entertainment Precinct contained 1,314 licensed premises,

including 425 premises authorised to trade after midnight and 210 authorised to trade after 3 a.m. (City of Sydney & NSW Government, 2014). Licence types range from small bars and restaurants to large hotels and registered clubs. The Entertainment Precinct captures areas with the highest density of licensed premises in the City of Sydney, including Kings Cross, Oxford Street, and The Rocks (City of Sydney & NSW Government, 2014). While estimates of the numbers of visitors to the Entertainment Precinct are not available, pedestrian counts, and transport and taxi rank data provide some indication that many thousands of people visit the Entertainment Precinct on Friday and Saturday nights (City of Sydney, 2013; Menéndez, Weatherburn, Kypri, & Fitzgerald, 2015).

The Sydney metropolitan area (Sydney Statistical Division of the Australian Standard Geographical Classification) is approximately 17,600km² in size and has an estimated resident population of 4,627,345 (ABS, 2012; Figure 2). The Sydney CBD Entertainment Precinct represents 0.1 per cent of the Sydney metropolitan area.

DATA SOURCES

Three administrative data sources were used in this study - the NSW Police Force Computerised Operational Policing System (COPS; via BOCSAR), the NSW Ambulance Computer-aided Dispatch (CAD) database, and the NSW Emergency Department Data Collection (EDDC). The health related databases were obtained from Secure Analytics for Population Health Research and Intelligence. Information on the identities of individuals was not obtained.

INCLUSION CRITERIA

We included information on persons of all ages; recorded by police as being involved in an incident of grievous bodily harm (as a person of interest proceeded against or as a victim), having requested paramedic assistance following an assault, or presented to an emergency department for an acute alcohol illness. The period of interest was 1 January 2004 to 31 December 2013. We defined late-night assaults as assaults reported to police or ambulance during the hours of 10 p.m. and 6 a.m. on any night of the week. These hours provide a proxy measure of assaults where alcohol was involved, an established approach to approximating trends in alcohol-related incidents (Kypri et al., 2011; WHO, 2000). For comparability, we only included emergency department presentations during the hours of 10 p.m. and 6 a.m. on any night of the week.

The age range of 18 to 29 years was selected to explore trends among an age group known to have above-average rates for single drinking occasion risk of harm (AIHW, 2014). The alcohol minimum purchasing age is 18 years in all Australian jurisdictions, including NSW. Trends in counts are reported. Rates are not reported due to the lack of an appropriate denominator since a large proportion of persons entering the

Figure 1. Map of Sydney Central Business District Entertainment Precinct (as of February 2014)

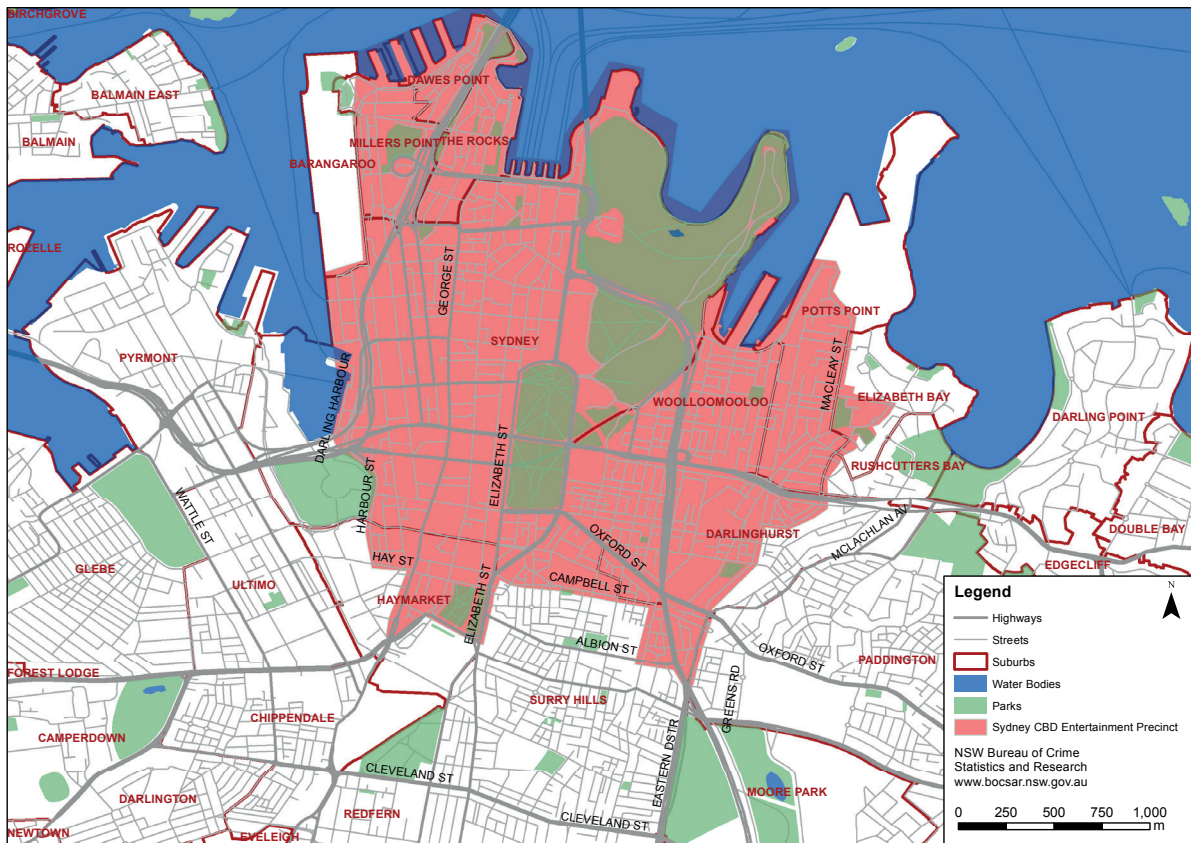
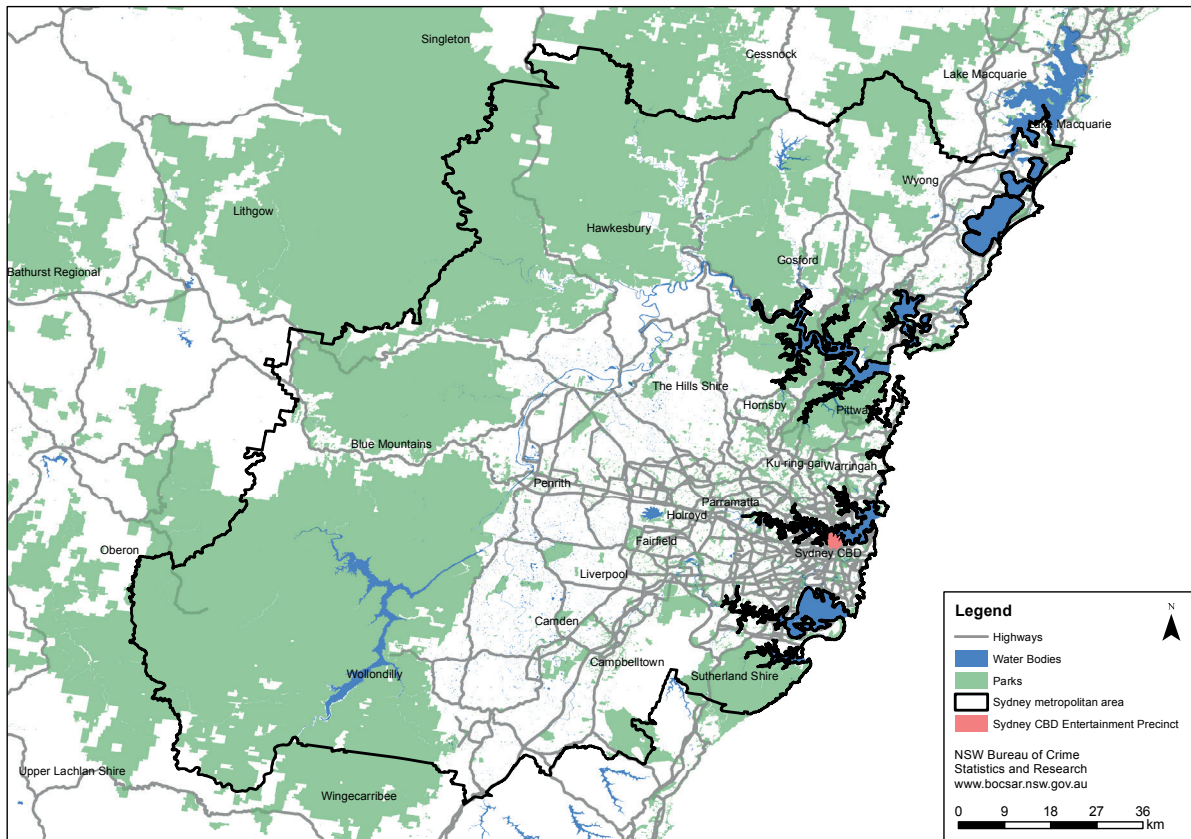


Figure 2. Map of Sydney metropolitan area



Entertainment Precinct are unlikely to reside there and patronage data are unavailable.

Data source-specific inclusion criteria are described in the following sections. A summary is provided in the Appendix (Table A1).

Police-recorded incidents of late-night grievous bodily harm

Assault incidents recorded in COPS by the NSW Police Force were extracted from data held by BOCSAR. Incidents included in this study were limited to those of grievous bodily harm (including malicious wounding), excluding domestic violence. Grievous bodily harm is considered the most serious kind of assault and is more likely to be recorded consistently over time than other forms of assault (e.g., common assault), as assaults resulting in injury are more likely to be reported to police than assaults not resulting in injury (Tarling & Morris, 2010).²

The recorded location of each incident was used to place it either in the CBD or elsewhere in metropolitan Sydney. In a small percentage of cases (between 1% and 4% each year), the location of the incident could not be determined with certainty; these incidents were omitted from the data presented.

While “counts” of incidents are reported, one incident could include a number of people recorded as a victim or a person of interest (i.e., an alleged offender). Incidents for 18 to 29 year olds were defined as those where either a person of interest proceeded against by police or a victim was recorded as being between 18 and 29 years of age.

Ambulance calls for incidents of late-night assault

Ambulance calls for incidents classified as assault were extracted from the NSW Ambulance CAD database. When an ambulance is requested (by calling Triple Zero “000”), the call-centre dispatcher, supported by CAD software, records a “problem type” from a controlled list based on caller information. For this study, incidents of assault were identified by searching the problem type field in the CAD database for problem categories including the term “assault”. All types of assault, including sexual assault, were retained for analysis. Cases of domestic violence could not be excluded, as these are not explicitly classified in the CAD database. Not all Triple Zero (000) calls in 2004 were available for analysis so results are presented for 1 January 2005 to 31 December 2013 only.

The latitude and longitude of the incident location where the caller requested an ambulance were used to determine those that fell within the boundaries of the study. Where possible the age of the person requiring an ambulance was extracted. The caller is often not the person in need of assistance and so age is not always accurate, known or recorded. Indeed, it was not

possible to accurately report on the number of assaults by age group or sex in the years 2005 to 2009 due to a large proportion of missing values (during this period, 19% of records were missing sex and 55% were missing age, compared with 20% of records missing sex and 6% missing age in 2010–2013).³ Sex and age specific trends are included for 2010 to 2013 only.

Duplicate calls for the same incident were removed, but calls cancelled en route, or after the ambulance arrived, were included because these calls may have been made in relation to a genuine incident, and it was not possible to verify that this was not the case.

Emergency department presentations for acute alcohol illness

Combined counts of presentations to emergency departments at St Vincent’s, Royal Prince Alfred and the Sydney Hospital were included. These three major public hospitals would receive the majority of patients from the CBD because they are located within the CBD or in close proximity.⁴ Data from 22 of 23 other public hospital emergency departments located in the rest of metropolitan Sydney (Figure 2) were included to represent the comparison area.⁵ Up to two private hospitals provided emergency department services in the rest of metropolitan Sydney. Private hospitals represent less than 2 per cent of emergency department presentations in NSW (calculated from ABS, 2015 and NSW Ministry of Health, 2014).

Emergency department presentations with a primary provisional diagnosis of alcohol intoxication, poisoning, dependence, withdrawal, elevated blood alcohol reading, medico-legal blood alcohol or drug test, and mental and behavioural disorders due to alcohol were included. Depending on the information system used by the hospital, diagnosis codes were recorded using the International Classification of Diseases (ICD), ninth revision (Australian clinical modification or ICD-9-CM), tenth revision, Australian clinical modification (ICD-10-AM) or the Systematized Nomenclature of Medicine, Clinical Terminology (SNOMED-CT). ICD-9 codes included were: 291.0, 291.3, 291.8, 291.9, 303.00, 303.90, 305.00, 790.3, 980.0, 980.8, V70.4. ICD-10 codes included were: F10.0, F10.2, F10.5, R78.0, T51, T51.0, T51.8, T51.9, Z72.1. SNOMED-CT concept identifiers are available from the authors on request. Presentations where alcohol may be a factor in the reason for presentation, such as traumatic injury following alcohol consumption, are unable to be systematically identified from the EDDC and therefore were not included.

Diagnosis information was available for 99 per cent and 94 per cent of patients in the CBD and the rest of the metropolitan Sydney area respectively. Due to missing information on age or sex, 32 and 33 records, respectively, were excluded from the CBD and the rest of metropolitan Sydney hospitals.

RESULTS

Police-recorded incidents of late-night grievous bodily harm

Figure 3 shows the annual number of incidents of grievous bodily harm over the 10-year period in the CBD and the rest of metropolitan Sydney. A total of 913 incidents were recorded for the CBD, while 4,113 incidents were recorded in the rest of metropolitan Sydney.

In the CBD, the annual number of incidents peaked in 2007 at 128 and then more than halved to 55 by 2013. The trend in assaults for 18 to 29 year olds showed the same pattern. In the rest of metropolitan Sydney, the annual number of incidents peaked in 2008 at 527, and almost halved to 266 by 2013.

Approximately 95 per cent of incidents in both the CBD, and the rest of metropolitan Sydney, involved males as victims or persons of interest, while only 8 per cent in the CBD and 12 per cent in the rest of metropolitan Sydney involved females.⁶ An estimated 78 per cent of incidents in the CBD, and 65 per cent of incidents in the rest of metropolitan Sydney, involved a victim or an alleged offender aged 18 to 29 years. Approximately 21 per cent of late-night incidents of grievous bodily harm involving 18 to 29 year olds in the Sydney metropolitan area occurred in the CBD. These proportions are summarised in Table A2.

Ambulance calls for incidents of late-night assault

Figure 4 shows the total calls for incidents of assault in the CBD and the rest of metropolitan Sydney for the period 1 January 2005 to 31 December 2013.

Ambulance calls for assault in the CBD followed a similar trend to the police-recorded assault trend for all ages; calls increased sharply between 2005 and 2007 (from 1,189 to 1,624), and then declined by almost half between 2008 and 2012 (from 1,522 to 838). The number in 2013 was 29 per cent lower than in 2005. A similar trend was observed in the rest of metropolitan Sydney, however the decline was much greater than that seen in the CBD, with the number of calls for 2013 (3,779) less than half (48%) those observed in 2005 (7,895).

During 2010–2013, years with almost complete reporting of age and sex (94% and 80% non-missing, respectively), 42 per cent of calls in the CBD involved males aged 18 to 29 years and 8 per cent involved females of the same age. In the same period, the percentage of calls in the rest of metropolitan Sydney that involved young males (27%) was lower than that in the CBD (42%), while the percentage was similar for young females (10%).

During 2010–2013 the CBD accounted for 22 per cent of all emergency calls for alcohol-related assault involving 18 to 29 year olds in metropolitan Sydney (2010–2013).

Figure 3. Police-recorded incidents of grievous bodily harm between 10 p.m. and 6 a.m., by age and year, 2004–2013: Sydney CBD Entertainment Precinct and Remainder of Sydney metropolitan area

Number of grievous bodily harm incidents

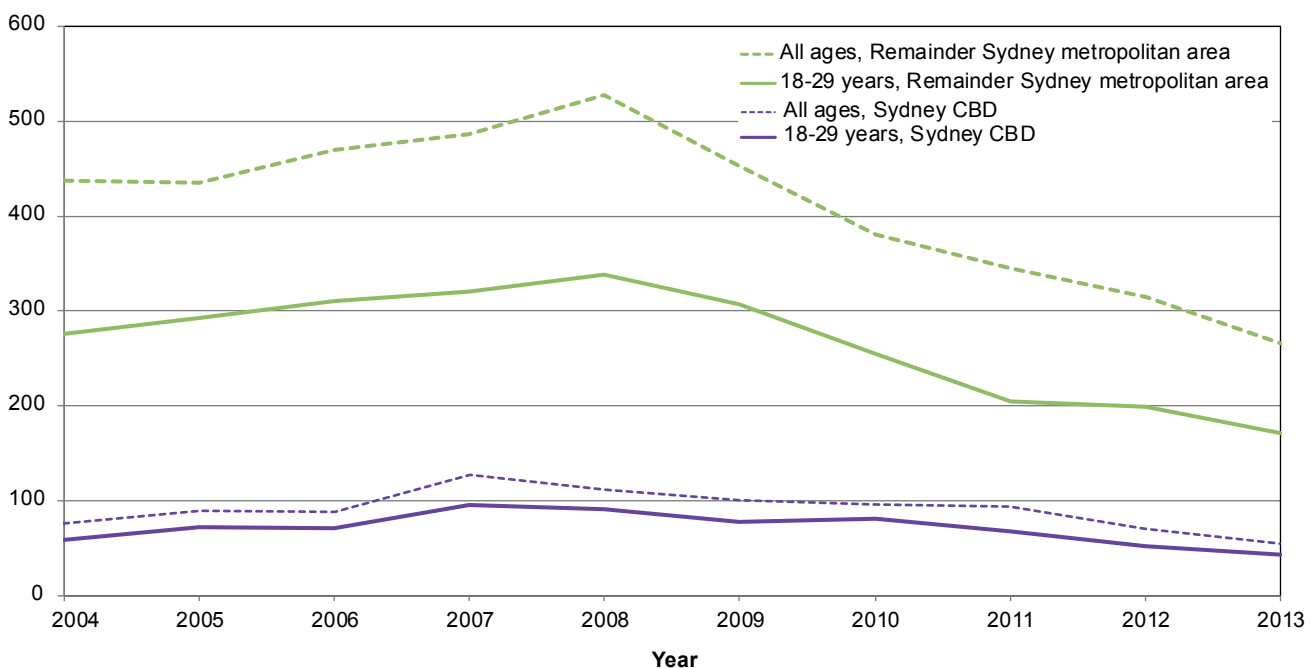


Figure 4. NSW Ambulance calls for assault between 10.p.m. and 6 a.m., by age and year, 2005–2013: Sydney CBD Entertainment Precinct and Remainder of Sydney metropolitan area

Number of ambulance attendances

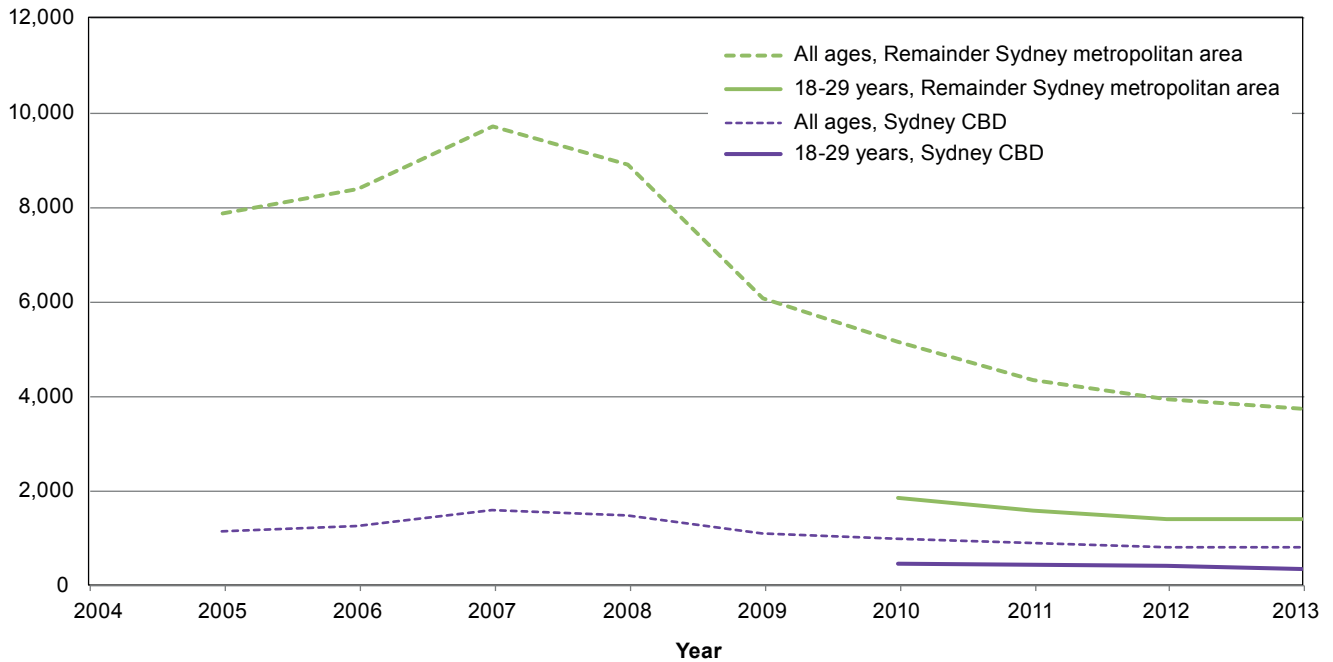
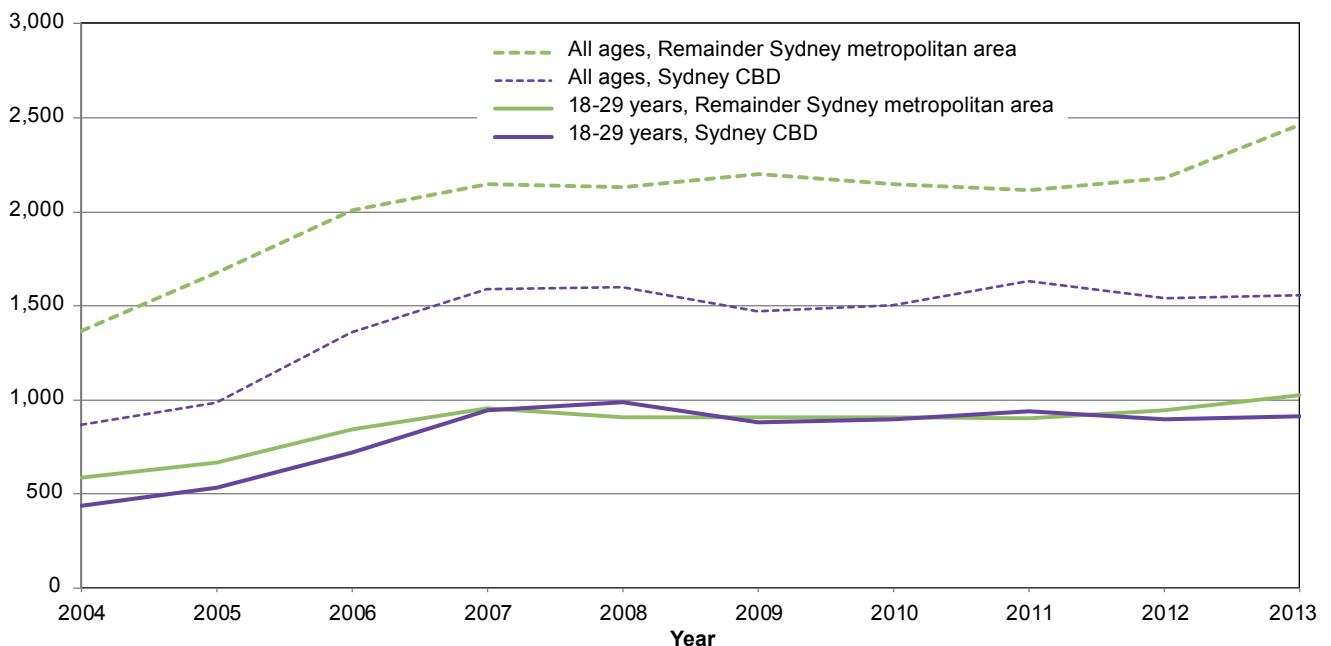


Figure 5. Emergency department presentations for acute alcohol illness between 10 p.m. and 6 a.m., by age and year, 2004–2013: Sydney CBD Entertainment Precinct and Remainder of Sydney metropolitan area

Number of emergency department presentations



Emergency department presentations for acute alcohol illness

Presentations to emergency departments associated with the CBD almost doubled between 2004 and 2008; from 868 to 1,601 for all ages (Figure 5). Presentations declined slightly in 2009 and subsequently remained relatively stable, with 1,556 presentations in 2013. Presentations for 18 to 29 year olds followed a similar trend to that for all ages and accounted for about half of all the presentations (58%).

Also shown in Figure 5 are emergency department trends in the rest of metropolitan Sydney. Trends for all ages and 18 to 29 year olds were similar to those in the CBD. However presentations for 18 to 29 year olds in the rest of metropolitan Sydney accounted for a lower proportion (42%) of all presentations than in the CBD (58%).

In the study period, the three CBD-associated hospitals accounted for 41 per cent of all late-night presentations in metropolitan Sydney for acute alcohol illness for persons of all ages (14,106 of a total 34,538). Among 18 to 29 year olds, the three hospitals received almost half (48%) of all acute alcohol illness presentations in metropolitan Sydney (8,147 of 16,799).

DISCUSSION

This study is the first to examine trends in three independent datasets describing alcohol-related violence and harm associated with the newly defined Sydney CBD Entertainment Precinct (CBD). Between 2004 and 2008, the annual number of assaults recorded by police and ambulance services increased two-fold in the CBD. Similarly, between 2004 and 2008, alcohol-related presentations increased two-fold at the three emergency departments most likely to service the CBD. However, between 2008 and 2013, alcohol emergency department presentation trends stabilised around 2008 levels, while assaults dropped to their lowest levels in the 10 years of the study. Trends in police-recorded incidents of grievous bodily harm were mirrored by trends in ambulance calls for assault. Across all three data sources, trends in the rest of metropolitan Sydney, the comparison area for this study, were similar to those seen in the CBD, with the exception of police-recorded assault which started to decline a year earlier (2007) in the CBD compared to elsewhere (2008).

The CBD accounted for a high proportion of late-night incidents in metropolitan Sydney during the 10-year period, and young adults (aged 18–29 years) were associated with the majority of harms occurring within the CBD. This age group was involved in 78 per cent of late-night grievous bodily harm incidents recorded by police and 62 per cent of ambulance Triple Zero calls for incidents of assault in the CBD, and 58 per cent of alcohol-related emergency department presentations at the three public hospitals most likely to service the CBD.

The divergence in assault and emergency department alcohol trends from 2008 suggests that changing circumstances in the night-time economy such as government reforms, policing activity or other alcohol supply or service factors may have affected alcohol consumption and violence in different ways or to a different extent. Determining the drivers of change is extremely challenging. Numerous reforms were introduced concurrently or in close succession. Some were national, statewide, or more locally-specific, and occurred against a background of extensive political and public debate.

NSW government initiatives that may have contributed to change included: a freeze on granting 24-hour liquor licenses (2008); special license conditions (e.g., 2 a.m. lockouts and no shots or glass containers after midnight) for licensed premises with the highest numbers of violent incidents (OLGR, 2008); a freeze on new liquor licenses in parts of Sydney (2009); the “three strikes” disciplinary scheme for licensed premises, whereby a license can be suspended or cancelled (2011); small bar licenses to encourage diversity of licensed venues (2013); and a ban on takeaway alcohol sales after 10 p.m. across NSW (2014; Roth, 2014). A national government initiative was the introduction of the “alcopops” tax in 2008 (Parliament of Australia, 2009), and was associated with the levelling out of emergency department presentations for acute alcohol illness in NSW (Gale et al., 2015). Wider economic factors such as the “global financial crisis” (GFC) in 2008 and an associated decline in disposable income may have also contributed to the observed trends, although there is no local evidence to show this (Gale et al., 2015). Indeed, a study by Bor, Basu, Coutts, McKee, & Stuckler (2013) found that the GFC was associated with an increase in frequent “binge” drinking in the United States.

Other factors or drivers of change may be less well documented, including changes in policing activity or changes made by licensed establishments themselves, such as employing security guards. The consistency in trends between the CBD and the rest of metropolitan Sydney suggests geographically broad factors, rather than CBD-specific interventions, drove the observed trends. Indeed, during our study period, only liquor licensing restrictions introduced in Kings Cross in 2012 were locality-specific.

The geographic precision provided by police and ambulance data sources and the inclusion of a comparison area are major strengths of our study. A study by Menéndez, Tusell, and Weatherburn (2015) examined whether the liquor licensing reforms introduced in NSW between 2008 and 2013 had any effects on police-recorded incidents of serious assaults, and found that while there was a reduction in assaults, it was not possible to conclude that the drop in assaults was due to any particular liquor licensing reform, largely because of the lack of a suitable comparison site. However, the consistency in trends between the independent police and ambulance assault data suggests that police-recorded grievous bodily harm incidents

are a valid means of estimating trends in violence, and are not markedly influenced by factors such as police recording practices or the willingness of members of the public to report assaults.

This study has some limitations. Trends will be influenced by the number of persons entering the CBD as well as the amount of alcohol consumed. Suitable population denominators for participants in the night time economy were unavailable and thus population rates were unable to be calculated; neither patronage nor sales data were available and as resident population estimates do not adequately represent the population at risk of harm, rates based on these estimates could give a false impression of validity. Patronage and sales data by geographical area would allow for a more precise comparison area, where changes in service delivery variables (e.g., trading hours, number and size of venues) could be compared more accurately to better understand which interventions were effective. The use of the Sydney metropolitan area as the comparison in this study has its limitations as the area encompasses a range of entertainment venues and population density. The emergency department data offered limited value in drawing conclusions about alcohol illness associated with the CBD. Hospital patient catchment areas in NSW are not controlled or prescribed. The three hospitals included in this study service the CBD, but also receive patients from surrounding or more distant areas. Further, alcohol as a risk factor is not systematically recorded in the emergency department database, and use of diagnoses under-estimates alcohol-related harms such as injury in which alcohol is a risk factor (Humphrey, Casswell, & Han, 2003; Indig, Copeland, & Conigrave, 2009; Indig, Copeland, Conigrave, & Rotenko, 2008). The acute alcohol illness diagnoses available for analysis included dependence, which does not reflect an acute illness. On the other hand, an acute situation may have led to the patient presenting to the emergency department. Accuracy of emergency department diagnoses may have also been affected by recording practices and the information system used.

The study may have been strengthened by examining other outcome measures, such as emergency department presentations for injuries, recognised as a useful indicator of alcohol-related harm for young people (Young et al., 2004). A non-alcohol-related outcome could have been included from each database to understand whether the trends were being driven by alcohol- or non-alcohol-related factors.

In addition to extending the types of alcohol-related emergency department presentations examined, future studies could include a broader range of ambulance calls and police incidents types. In relation to police-recorded incidents, less serious assaults such as common assault and assault occasioning actual bodily harm could be examined, as well as incidents of domestic violence. The assumption that the period between 10 p.m. and 6 a.m. captures alcohol-related incidents could be further validated. Enhancement of ambulance data with human review

of narrative information, as has been done in Victoria (Lloyd, Matthews, & Gao, 2014), may also be considered to improve the completeness and utility of ambulance data.

CONCLUSION

The number of records from all three data sources consistently increased prior to 2008. Subsequently, police and ambulance records of late-night assaults in the CBD declined in unison, while emergency department presentations for acute alcohol illness only levelled out. This suggests that, from 2008, there were changes in the night-time economy that led to a decline in the number of incidents of late-night violence in the CBD, while other alcohol harms persisted at levels similar to that of 2008. Further, the broad consistency of these trends with those in the rest of metropolitan Sydney suggest that factors driving the trends may not be specific to the CBD. These findings support a continued focus on preventing alcohol-related harms associated with the night-time economy. These harms continue to impose a substantial burden on society, particularly among young adults.

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NOTES

- 1 Sum of usual residents of three CBD postal areas (2000, 2010 and 2011) from the Australian Bureau of Statistics 2011 census statistics (ABS, 2011).
- 2 Tarling and Morris (2010) used self-reported data from the British Crime Survey 2007/08 to examine factors associated with whether a violent crime was reported to the police. Injury was defined by the question: "were you bruised, scratched, cut or injured in any way?". The NSW Police Force definition of grievous bodily harm (including malicious wounding) states that the phrase "grievous bodily harm" should be given its ordinary meaning of really serious bodily harm. While it is more likely that grievous bodily harm would be consistently reported than other forms of assault, there could nevertheless have been differences in the interpretation and application of the definition over time.
- 3 It was likely that there would be systematic bias potentially related to the records with missing values (e.g., records with missing details more likely to involve calls by third parties and where multiple persons are involved).
- 4 While the majority of emergency department cases corresponding to activity in the CBD would result in presentations at these three hospitals, the three hospitals

included in the study may receive a number of patients from neighbouring areas not within the CBD boundaries. Patients from the CBD may also be transported to more distant hospitals depending on bed availability. Therefore data may over- or under-estimate the number of presentations.

- 5 Hospitals included in the remainder of metropolitan Sydney: Auburn; Bankstown-Lidcombe; Blacktown; Blue Mountains District Anzac Memorial; Camden; Campbelltown; Canterbury; Concord; Fairfield; Gosford; Hornsby and Ku-ring-gai; Liverpool; Manly; Mona Vale; Mount Druitt; Nepean; Prince of Wales; Royal North Shore; Ryde; St George; Sutherland; and Wyong Hospitals.
- 6 As stated in the Method section, the counts relate to incidents and each incident may have included one or more victims or persons of interest proceeded against. For example, an incident may have involved one male and one female. As such, the percentages do not add up to 100 per cent.

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APPENDIX

Table A1. Data sources and inclusion criteria

Data source	Managed by	Contributing sites	Data of interest	Location	Inclusion criteria	Time period
NSW Police Force Computerised Operational Policing System (COPS)	NSW Bureau of Crime Statistics and Research	Local Area Commands that attended incidents in the CBD and the Sydney metropolitan area	Incidents of grievous bodily harm not flagged as domestic violence	Geo-coded location of incident	Incidents occurring between 10 p.m. and 6 a.m. and involving a perpetrator proceeded against and/or victim of any age and those aged 18-29 years	1 January 2004 to 31 December 2013
NSW Ambulance Computer-aided Dispatch (CAD) Data	NSW Ambulance	NSW wide (all operational divisions) Triple Zero calls for incidents occurring in the CBD and the Sydney metropolitan area	Triple Zero calls where 'assault' is identified in the CAD 'problem type' field	Geo-coded location of incident	Persons of all ages and those aged 18-29 years for whom a triple zero call was made between 10 p.m. and 6 a.m. for an assault of any kind (including sexual assault and domestic violence)	1 January 2005 to 31 December 2013
Emergency Department Data Collection (EDDC)	NSW Ministry of Health	3 public hospitals associated with the Sydney CBD Entertainment Precinct (St. Vincent's, Royal Prince Alfred and Sydney), and 26 public hospitals in the remaining Sydney metropolitan area	Presentations to ED where acute alcohol illness ^a was recorded as the patient's primary provisional diagnosis	Hospital where emergency care was sought	Presentations between 10 p.m. and 6 a.m. in persons of all ages and those aged 18-29 years	1 January 2004 to 31 December 2013

^a Diagnosis grouping of: ICD-9: 291.0, 291.3, 291.8, 291.9, 303.00, 303.90, 305.00, 790.3, 980.0, 980.8, V70.4; ICD-10: F10.0, F10.2, F10.5, R78.0, T51, T51.0, T51.8, T51.9, Z72.1; SNOWMED-CT: available on request.

Table A2. Comparison of selected features of the three data sources, incidents occurring between 10 p.m. and 6 a.m., 2004–2013

	Police-recorded incidents of late-night grievous bodily harm	Ambulance calls for incidents of late-night assault	Emergency department presentations for acute alcohol illness
Proportion of CBD incidents involving males	95%	84% ^a	56%
Proportion of incidents in the rest of metropolitan Sydney involving males	95%	70% ^a	58%
Proportion of CBD incidents involving 18–29 year-olds	78%	62% ^a	58%
Proportion of incidents in the rest of metropolitan Sydney involving 18–29 year-olds	65%	47% ^a	42%
Proportion of incidents in metropolitan Sydney occurring in CBD, all ages	18%	15% ^b	41%
Proportion of incidents in metropolitan Sydney occurring in CBD involving 18–29 year-olds	21%	22% ^a	48%

^a 2010–2013 only^b 2005–2013 only