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Alcohol Related Crime in City of Sydney Local Government Area

An Analysis for the Council of the City of Sydney

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ALCOHOL-RELATED CRIME IN CITY OF SYDNEY LOCAL GOVERNMENT AREA

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ABBREVIATIONS

AIHW	Australian Institute of Health and Welfare
BAL	Blood Alcohol Level
BOCSAR	NSW Bureau of Crime Statistics and Research
ETP	Extended Trading Permits
LGA	Local Government Area
MCDS	Ministerial Council on Drug Strategy
NSW	New South Wales
RBT	Random Breath Testing
RSA	Responsible Service of Alcohol
SPA	Special Policy Area

EXECUTIVE SUMMARY

- ***The literature search*** identified that alcohol strategies aimed at reducing alcohol-related harm which have the most evidence for their effectiveness and are most amenable to local government are those that aim to restrict alcohol availability. Specific strategies are:
  - *Density of alcohol outlets*. Higher densities of alcohol outlets predict higher rates of alcohol problems (eg. assaults, drunkenness), especially for local residents.
  - *License types*. All types of licensed premises are associated with alcohol-related harm, although this relationship is strongest for hotels.
  - *Specific venues.* A majority of alcohol-related harm is associated with a minority of premises, although the majority of harm occurs in outdoor areas (not in the licensed premises themselves).
  - *Trading hours.* Australian data show late night venues are associated with increased blood alcohol levels among patrons, assaults and increased purchasing of alcohol.

- ***The case studies*** examined highlighted three key points:
  - Areas with a greater number of alcohol outlets and/or greater densities of alcohol outlets, were associated with higher rates of alcohol-related harm.
  - Strategies put in place were inconsistent with research findings and failed to achieve reductions in alcohol-related harm.
  - Strategies that do not address the factors associated with increases in alcohol harm (number, density, types, trading hours of licensed premises) are likely to be ineffective.

- ***The data analyses*** conducted for this report show:
  - Kings Cross has statistically significantly more alcohol-related harm than Darlinghurst and alcohol-related crime in both areas increased substantially from 2001-2006 (about 40% in Kings Cross and 20% in Darlinghurst).
  - High rates of alcohol-related harm are most likely linked to high rates of late night trading venues in Kings Cross (86% of hotels/clubs) and the increase in alcohol outlets in Darlinghurst (37% from 2001-2006).

- ***Recommendations.*** Six recommendations are made, summarised as follows:
  1. Improved records relating to the characteristics of alcohol venues (such as trading hours) that currently operate within the jurisdiction of the Council of the City of Sydney would aid future analyses and data interpretation.

  2. If appropriate, a meeting with representatives from the Land and Environment Court ought to be convened as soon as possible to explain the principal findings of the report.

  3. Rates of alcohol-related crime ought to continue to be monitored over time and alternative data sources ought to be added, particularly alcohol-related hospital Emergency Department presentations and alcohol-related road traffic accidents.

  4. There is a clear opportunity for the Council of the City of Sydney to experiment with different intervention strategies, using the outcome measures used in this analysis, to examine the cost-benefit of those interventions to the community.

  5. Increasing the number of alcohol outlets, increasing the number of late night alcohol outlets and/or increasing the density of alcohol outlets – all of which increase the net availability of alcohol in a defined area – will increase rates of alcohol-related crime.

  6. Although these data analyses show a cumulative increase in alcohol-related crime over time in both Kings Cross and Darlinghurst, an opinion about whether a saturation point has been reached needs to be formed with reference to the recent community survey conducted by the Council of the City of Sydney in Kings Cross.

1. INTRODUCTION

1.1 Setting the scene: the decision of the Land and Environment Court

In December 2006, the Land and Environment Court upheld an appeal against the Council of the City of Sydney's refusal of a development application for a late trading licensed restaurant and cocktail bar in Kings Cross. In part, Council's objection regarded the increase in antisocial behaviour and cumulative impacts that Council argued would arise from the new venue. A key component of the Court's response was as follows:

> *"Interestingly, the evidence on the cumulative impacts issue referred to the notion of saturation point which many of the residents and police said had been reached. However, no substantive evidence was presented…so as to allow any objective assessment." (point 41)*

The Court further argued that the concepts of 'cumulative impacts' and a 'saturation point' are quantifiable and should be demonstrated. In particular, the Court noted the necessity of collecting comparative data from a control area to enable comparisons with, in this case, the Kings Cross district of Sydney. Indicators of impact suggested by the Court included: i) the number of incidents that occur in licensed premises and the public domain (including assaults, malicious damage and disorderly conduct); ii) the number of noise and waste complaints made in relation to licensed premises; iii) the number of other licensed commercial uses; and iv) the frequency and scale of special events.

The primary purpose of this report is to quantify the impact of alcohol-related crime on the Kings Cross and Darlinghurst areas within the City of Sydney, relative to defined comparison areas in greater Sydney, using the most recent methodologies available.

1.2 Defining the impact of alcohol: individuals vs populations

The impact of alcohol on a discrete population can be understood in terms of two distinct, but overlapping, orientations.

First, alcohol has an impact on individuals: the relationship between levels of consumption, alcohol dependence and the experience of alcohol-related problems varies widely between individuals. As a general example, some people drink relatively high amounts of alcohol, show signs of high alcohol dependence, but experience few problems. Conversely, others may drink relatively little, show no signs of alcohol dependence and yet experience substantial alcohol-related problems.

Second, alcohol has an impact across whole populations in two inter-related ways: the average consumption across the whole community and the number of people with high alcohol dependence and chronic drinking problems. The posited link between the two is that the higher the average consumption across a whole population, the greater will be the proportion of the community that have significant problems with alcohol (the greater the number of people exposed to alcohol, and the greater the extent to which they drink, the higher will be the proportion of the population that have significant problems with alcohol, and their problems will be more severe) (Rose, 1992).

It is important to make this distinction between the impact of alcohol on individual drinkers versus the population because responses aimed at minimising harm vary depending on which orientation is the primary focus. If the goal is to reduce the extent of problems for those individuals who already experience substantial harm, then appropriate intervention strategies are essentially clinical: GPs and other settings for early detection and intervention, through to specialist drug and alcohol clinics for those with chronic and high levels of alcohol dependence. If the goal is to reduce the harm caused to whole communities, for which the majority of members will not be experiencing substantial harm, then appropriate intervention strategies are essentially population focused: typical strategies include school-based education programs and legislation (for example, establishing a legal age of 18 years for the consumption of alcohol).

1.3 Measuring population level harms: the empirical approach

Researchers have been good at measuring the impact of alcohol on individuals, but only recently grappled seriously with the problem of measuring the impact of alcohol on a whole, defined population. This is the task set out by the ruling of the Land and Environment Court.

One attempt to measure the impact of alcohol is to try to establish the full costs associated with alcohol to a community. The social cost of alcohol abuse to Australia in 2004/2005, for example, has been estimated at $15.3 billion, which comprises 27% of the social costs resulting from the impact of alcohol, tobacco and all illicit drugs. This is compared to a social cost of $31.5 billion for tobacco (representing 56% of all costs) and $8.2 billion for all illicit drugs combined (representing 15%) (Collins and Lapsley, 2008).

These estimates attempt to establish an overall measure of the full, or true, extent of alcohol-related harm. What researchers have traditionally not done well is establish how to measure changes in drug and alcohol use and problems over time, or between different defined populations, in a methodologically rigorous way. The importance of this point, to which the Land and Environment Court has alluded, is that such comparative analyses allow valid identification of community characteristics that are associated with greater or fewer alcohol incidents, and are able to be effectively manipulated by all levels of government to optimally benefit the community.

One way of making comparisons over time is to use the Collins and Lapsley approach of adding up all the costs at one point in time, repeating the process at a subsequent point in time, and quantifying the difference. Similarly, this principle could be applied to examine the impact of alcohol on different communities, or even defined populations within a community: add up the costs imposed on one population and compare it to another. The problem with this approach is that the methodology is essentially inapplicable to the questions being asked: the Collins and Lapsley approach is a valid method for quantifying the total cost of alcohol, or other drugs, relevant to a defined population. If the question pertains to the relative effect of some change in a community over time, for example an increase in the number of hotels, or a reduction in the number of police, or a change in the tax regime (as has recently occurred in Australia with the increase in the rate of tax on alcopops), then a different methodology is required: one with optimal sensitivity to changes over time or between communities.

To briefly summarise, the argument to date establishes two things: prompted by the decision of the Land and Environment Court, it is necessary to define and quantify population level harms (as opposed to individual levels harms) and those harms ought to measured in such a way that allows methodologically rigorous comparisons of alcohol-related harms, both over time and

between different defined communities. This will facilitate the quantification and demonstration of the cumulative impacts of alcohol on the defined communities of interest.

The second major aspect of the decision of the Land and Environment Court is to attempt to establish whether a saturation or tipping point is quantifiable and demonstrable, and whether this point has been reached in the defined communities of interest. Unlike an empirical-driven approach to quantifying harms, however, this is an interpretive question of community opinion: it can be quantified by generating appropriate data, but whether a saturation point for alcohol-related harm has been reached is a matter of majority community opinion, rather than an empirical analysis of the relevant data.

1.4 Measuring population level harms: community opinion

The empirical crime data in relation to alcohol-related harm are important, but say nothing about the levels of harm that individuals within a community are prepared to tolerate. This is essentially the concept of a saturation, or a tipping, point. The subtle point to draw out here is that having alcohol as a legal substance in Australia means that there will be some associated cost: the issue is not whether the community is prepared to tolerate the harms associated with alcohol misuse, but attempting to quantify the level of harm a community is prepared to absorb in order to have legal access to alcohol. There are no empirical data that can answer this question: it is a matter of determining the majority opinion of the individuals within a defined community. It is important that individuals are aware of the true extent of the impact of alcohol, both positive and negative, so that they can make an informed choice, but the level of harm a community is prepared to accept is not in itself an empirical question. Rather, it is a case of determining, and acting in accordance with, the view of the majority. An accepted way to quantify the view of the majority is via surveys of randomly selected individuals within a community. Such a survey has been conducted under the auspices of the Council of the City of Sydney and the results are reported elsewhere.

1.5 Responding to harms: the role of local governments

Considering which strategies are reasonably available to local governments and other local authorities in responding appropriately to empirically determined rates of alcohol-related harm is

important for two principal reasons. First, the strategies that are within the control of local government can, and should, be clearly identified to the community, allowing the community to assist in the decision making process. In the current context, for example, these could be identified in a community survey, asking residents to rank and allocate resources according to what they think ought to be done. Second, the value in doing this measurement work is directly related to the extent to which there is some reasonable prospect of reducing the levels of alcohol-related harm: if there are no strategies that local governments can implement to reduce harms then measuring the effect of changes, for local governments and local courts, becomes a relatively empty academic exercise. Therefore, this report will also examine the literature to identify previous and existing activities in which local governments may engage to reduce the levels of alcohol-related harms that exist within their communities.

1.6 Aims of this report

This report has three broad aims:

1. To identify evidence-based strategies in the literature that local governments might reasonably implement to reduce the impact of alcohol-related harm on their communities.
2. To quantify the cumulative impacts of alcohol-related crime on Kings Cross and Darlinghurst areas in Sydney.
3. To examine whether a saturation, or tipping point, has been reached.

2. LITERATURE REVIEW

2.1 Harms of alcohol consumption

In global terms, 4% of the overall burden of disease is attributable to alcohol, which means it accounts for a similar amount of death and disability as tobacco use (4.1%), and is only surpassed by the burden of harm attributable to hypertension (4.4%), unsafe sex (6.3%) and being underweight (9.5%). In developed countries, including Australia, the alcohol-related burden of disease rises to 6.8% (Room *et al.*, 2005). Although the relationship between alcohol consumption and health is complex and multidimensional, alcohol is causally related to more than 60 medical conditions, the majority of which are deleterious relationships (Room *et al.*, 2005).

Relatively recent research has established that the detrimental aspects of alcohol use are not restricted to those with high levels of dependence (Kreitman, 1986). Put another way, this means that alcohol-related harm occurs across the continuum, from low dependent problem drinking to highly dependent chronic drinking. Crucially, however, further analysis shows that the majority of alcohol-related harm experienced in a defined community or population, is actually attributable to relatively minor injury and disease experienced by the numerically very large group of relatively low dependent problem drinkers, rather than the relatively severe disease experienced by the numerically small group of highly dependent drinkers.

Three pieces of evidence support this assertion. First, irregular drinking to the point of intoxication has been shown to contribute to the alcohol burden of disease (Rehm *et al.*, 2003). Since that is the dominant pattern of drinking in Australia (AIHW, 2008), it accounts for the majority of the burden of harm to the community overall (although not necessarily to individual drinkers). Second, analysing the disease codes applied to patients in health care settings shows that in high income countries with low mortality (including Australia), over half the alcohol-related burden of disease is attributed to alcohol-use problems, rather than alcohol dependence (Room *et al.*, 2005). Third, there is now substantial scientific support for the connection between alcohol consumption and non-disease related harms, such as violence and social disruption: an estimated 91% of street offences that occur between 10pm and 2am are alcohol-related (Ireland and Thommeny, 1993), while about two-thirds of patients presenting to an inner Sydney hospital emergency department following their involvement in inter-personal violence had been drinking

(Poynton *et al.*, 2005). This connection, and the link with motor vehicle and other accidents, means alcohol consumption can cause substantial harm to the health of others in the community, not just to the drinker alone (Room *et al.*, 2005).

In conclusion, although health and social problems arising from alcohol use are often familiar and may be taken for granted, the high burden of harm attributable to alcohol provides strong justification for introducing and strengthening policies and practices aimed at reducing rates of alcohol-related problems. Further, for developed Western countries, these strategies are likely to be most cost-beneficial when they target the large group of relatively low dependent drinkers who episodically drink to intoxication.

2.2 Responding to alcohol harms: the role of local authorities

Accepting that it is the relatively large number of low dependent drinkers in the community that cause the majority of alcohol-related harm to themselves and others, raises the question as to which strategies local authorities might reasonably implement themselves, or support others to implement, in order to minimise the impact of alcohol harms. Local authorities include those responsible for granting and monitoring alcohol licenses, as well as those responsible for community amenity. The question as to which strategies might reasonably be implemented will be examined in three ways: i) identifying what research evidence suggests is not effective; ii) identifying the public health policies that have been shown to be effective; and iii) examining the experience of local authorities in Australia and internationally.

2.2.1 What does not appear to work?

School-based education and public information

Education and public information campaigns tend to be popular within the community but have been shown to be ineffective (Room *et al.*, 2005). School-based education programs may increase knowledge about the risks of drinking and favourably alter attitudes towards excessive drinking, but achieving behaviour change through school-based programs has been very difficult to demonstrate (Foxcroft *et al.*, 2003). There is some suggestion from the literature that engaging other community groups in school-based education programs might increase their effectiveness, but the evidence is tentative at best and is not linked to sustained effects over time (Wood *et al.*,

2006). Public information campaigns are similarly characterised by a lack of positive research evidence, suggesting media and other public health campaigns might be most effectively used in supporting the implementation of more proven strategies (Room *et al.*, 2005).

Responsible Service of Alcohol (RSA) training without enforcement

RSA training of hotel staff is essentially a mechanism introduced into Australia and some other developed countries to increase the likelihood that those who are under-age or who are already intoxicated are not served alcohol. There is clear evidence that this training is only effective in reducing alcohol-related harm if it is backed-up by active enforcement (Room *et al.*, 2005). Such enforcement is usually in the form of repeated police checks of licensed premises, at irregular times. Ensuring the value of RSA, therefore, fundamentally relies on the willingness or capacity of relevant authorities (licensing officers and local police) to enforce it.

Patron bans

Patron bans is the concept of denying entry or alcohol service to identified problematic individuals, either permanently or for a defined period of time. Although it is a difficult strategy to evaluate systematically, it is unlikely to impact much on overall levels of alcohol-related harm for two reasons. Firstly, it targets very few individuals, albeit individuals likely to have significant personal alcohol-related problems. Secondly, it is generally recognised and accepted that it is easier and more effective to influence the behaviour of licensees than customers (Room *et al.*, 2005).

2.2.2 What does appear to work?

In public health terms, the three biggest drivers of levels of alcohol harm are price, advertising and availability: specifically, the cheaper alcohol is, the more available it is and the less regulated its advertising is, the greater the harms (Hall, 2005). In addition to these major drivers, other approaches worth reviewing here, given they are relevant to Australia, are laws regarding the extent of licensees' liability, drink-driving laws and co-ordinated efforts across different community groups.

Licensee liability

Although a relatively new concept in Australia, there is the possibility of strengthening laws that hold the serving establishment partly liable for damage or harm caused by a customer who is underage or drunk (Room *et al.*, 2005). The major problem with this approach, and the primary reason it has not been systematically implemented in Australia, is the difficulty of linking the actions of an intoxicated or under-age person to a specific location or event. In any case, it is not a strategy readily amenable to local governments or local authorities.

Drink-driving laws

Establishing thresholds for Blood Alcohol Levels (BALs) that define illegal behaviour when exceeded, reinforced by advertising campaigns and the imposition of significant sanctions for those caught driving with an illegal BAL by random breath testing (the concentration of alcohol in the breath is essentially equivalent to BAL), has arguably been the most successful public health approach to reducing alcohol-related harm. From a population point of view, Random Breath Testing (RBT) is nonetheless unlikely to be substantially cost-effective, because it is very expensive to do in practice, and is only relevant to the relatively minor proportion of the population that drink and drive.

Co-ordinating the efforts of local community groups

A current review identified 22 studies that aimed to evaluate the effectiveness of community-based approaches to reducing alcohol-related harm (Hawkins *et al.*, under review). The overall result of the review was that community-based studies generally show small intervention effects. It is not clear, however, whether the small effect are because the community-based approaches are ineffective, or because of the poor methodologies that have been used to evaluate them to date: only four of the 22 studies were of the highest level of methodological rigour and five employed the weakest methodological designs; 20 studies used inadequate outcome measures; and all 22 studies failed to describe their interventions adequately. Despite the current weak evidence base, community-based approaches are theoretically sound and appear to be worth implementing, provided they are rigorously evaluated.

Price

Increasing the price of alcoholic beverages and restricting availability are effective measures that have been shown to decrease consumption of alcohol and to have a positive effect on rates of

cirrhosis mortality, drink-driving deaths and violent crime (Room *et al.*, 2005). One specific example of the effectiveness of changing price has been the application of a lower Commonwealth Government excise rate on low strength beer. As a result of this excise, the price of low strength beer was reduced and it now accounts for approximately 40% of beer consumed in Australia (Hall, 2005). Stockwell *et al.* (1998) have shown that night-time assaults and acute alcohol-related morbidity are strongly and significantly associated with the consumption of high strength beer and cask wine. Conversely, consumption levels of low alcohol beer were negatively associated with assault rates. This presents a compelling argument to increase tax on cask wine (low strength beer, for example, is currently taxed at four-times the rate of cask wine). More broadly, there is a sound economic argument for eliminating the current idiosyncratic discrepancies in the alcohol excise system by applying a standard excise based on the amount of alcohol being sold (volumetric tax). From a practical point of view, however, excise and price mechanisms are essentially beyond the control of local governments and other local authorities.

Advertising

Currently in NSW, advertising of alcohol by the alcohol industry, including manufacturers, is governed by a voluntary code of practice. Consequently there is no effective government monitoring of alcohol advertising and there are no legislative-enforced penalties for breaking the agreed code of practice. The example of tobacco provides strong evidence that strict and enforceable restrictions on alcohol advertising, which reaches the vast majority of the Australian population, would have a significant effect in reducing rates of alcohol-related harm.

Availability

The availability of alcohol is arguably the factor most amenable to the influence of local governments and local authorities. More specifically, local governments and licensing authorities are able to influence availability of alcohol by limiting the density of alcohol outlets, managing the mix of different types of alcohol outlets in a defined area and restricting the trading hours of licensed premises.

<u>Density of outlets</u>

A substantial body of descriptive evidence from the United States shows that the greater the density of alcohol outlets in a defined geographical location, the greater the number of alcohol-

related harms, such as violent assault, hospital admissions, motor vehicle accidents, pedestrian injuries and drink driving (Donnelly *et al.*, 2006).

There have been fewer Australian studies, but those that have been done generally confirm the results from the US:

- Stevenson *et al.* (1999) showed a strong positive relationship in local government areas in Sydney between outlet density and alcohol sales, and found that higher rates on both these factors predicted higher rates of assault. In rural NSW, outlet density was not predictive of assaults, while higher alcohol sales were.
- Donnelly *et al.* (2006) reported that more alcohol problems are related to higher densities of alcohol outlets: residents living in close proximity to licensed premises have reported significantly more problems with drunkenness and property damage than residents living further away; and residents living in areas with higher densities of alcohol outlets report more problems of drunkenness then residents living in areas with lower densities of alcohol outlets (Donnelly *et al.*, 2006). This is obviously going to be a bigger problem for those who live in the immediate vicinity of alcohol outlets, and so residents who choose to live there need to keep that in mind. Nevertheless, it is reasonable to try to minimise the harms that occur in and around licensed premises.

The most reasonable interpretation of existing data is that there is a cumulative and negative effect of increasing alcohol outlet density on drunkenness and related problems, especially for those who live in the immediate area of licensed premises, irrespective of licence type. Consequently, placing restrictions on the total number of premises in a given area (regardless of type) is a desirable policy option. Conversely, policies that increase alcohol availability are likely to increase alcohol-related problems.

Type of outlets

Studies from the United States have shown that bars are more strongly associated with alcohol-related harm, including assaults, than other types of licensed premises, such as restaurants (Lipton and Gruenewald, 2002). Although data suggest an increase in the number of licensed restaurants is associated with increased violence, the strength of the relationship is less than for bars (Lipton and Gruenewald, 2002). Restaurants also appear to be related to reduced rates of

hospitalisation (Lipton and Gruenewald, 2002), although this finding is offset by an increase in motor vehicle accidents (Scribner *et al.*, 1995).

This relationship between types of outlet and harm has been further refined in Australian studies. Specific examples include:

- Stockwell *et al.*, (1992) showed nightclubs, hotels and taverns were more strongly associated with alcohol-related harm than restaurants and registered clubs.
- Homel and Clark (1994) found more than 75% of incidents of physical aggression in Sydney hotels were associated with less than 20% of hotels and 66% of sites had no incidents.
- Stockwell (1997) showed Perth premises classified as high-risk for motor vehicle accidents and drink-driving were found to have three times as many customers exiting with blood alcohol concentrations in excess of 0.15 mg/ml, compared to low-risk premises. Premises that continue to serve obviously intoxicated persons were most likely to be associated with harm.
- Jochelson (1997) used crime mapping on all incidents of assault and robbery recorded by police in Inner Sydney between July 1995 and June 1996. They identified crime hot spots (CBD, The Rocks, Kings Cross and Oxford Street) and showed that most harm occurs outdoors (rather than actually in licensed premises) and that three venues within each of these hot spots accounted for the vast majority of on-premises assaults.
- Considine *et al* (1998) trialled a new data collection process (linking data), which showed that four of 400 licensed premises accounted for a large majority of incidents and only 21 had above average incident rates.
- Briscoe and Donnelly (2003) showed that for inner Sydney, Newcastle and Wollongong:
    - Hotels and nightclubs were associated with more assaults than other premises. Hotels, for example, accounted for 76% of all assaults, even though they only comprised 21% of all licensed premises;
    - A minority of hotels accounted for a majority of assaults: 12% had at least 10 assaults each (equating to about half of all assaults), while 38% had none;

- The majority of problem hotels had a 24 hour license (74% of 24 hour licensed hotels were associated with assaults, compared to 20% of 24 hour licensed hotels which were not associated with assaults);

- Poynton *et al.*, (2005) showed about a third of patients had been drinking prior to presenting to an inner Sydney hospital emergency department, the majority of whom (about two-thirds) had been drinking at a licensed premises. Of all patients presenting for injuries from inter-personal violence, two-thirds had been drinking.

Taken together, the literature to date indicates that all types of licensed premises are associated with deleterious outcomes, although the relationship is strongest for hotels and in more densely populated areas (Stockwell *et al.*, 1992; Scribner *et al.*, 1994; Stockwell, 1997; Lipton and Gruenewald, 2002; Briscoe and Donnelly, 2003). It is also apparent that the harms evident in crime data also impact on other services, especially hospital emergency departments (Poynton *et al.*, 2005).

It is also relatively clear that the majority of harms are associated with a minority of premises, with premises that are open late at night/early mornings and with more highly intoxicated patrons report more harms. This raises the possibility that longer trading hours typically results in greater consumption of alcohol and, therefore, a greater number of harms.

Trading hours

Australian studies have shown three basic findings in regard to trading hours:

- Harms in inner Sydney, Newcastle and Wollongong are concentrated in the small number of licensed premises that are open late at night, or early mornings, and on weekends (Briscoe and Donnelly, 2001; 2003).

- A study of the effect of Extended Trading Permits (ETPs) for licensed hotels in Perth showed male drivers aged 18-25 years, apprehended between midnight and 2am after drinking at ETP hotels, had significantly higher blood alcohol levels (BALs) than drivers who drank at non-ETP hotels. Impaired female drivers apprehended before closing time, however, had significantly lower BALs after drinking at ETP hotels. The authors conclude that at peak times for alcohol-related offences, late trading is associated with

higher BALs among those drivers most at risk of alcohol-related harm (young males) (Chikritzhs T and Stockwell T, in press).

- Compared to hotels with no change to their trading hours, hotels granted ETPs in Perth were associated with a 70% increase in the level of monthly assaults, between 1991 and 1995. There was also a dramatic increase in the wholesale purchase of alcohol by ETPs, compared to a modest increase for non-ETPs, especially for high alcohol content drinks. It is not clear whether the increase in wholesale purchases was driven by increased patronage, increased consumption by the same number of patrons, or both, only that both wholesale purchases and assaults dramatically increased (Chikritzhs T and Stockwell T, 2002).

2.2.3 Summary of likely effective strategies that local authorities could implement

Of all possible strategies aimed at minimising alcohol-related harm, those that relate to the *availability of alcohol* are the most amenable to local governments and other local authorities. Based on current evidence, the following specific strategies have the most evidence for their effectiveness:

- Net availability of alcohol ought to be restricted as much as possible, irrespective of license types. That is, it appears that an increase in alcohol problems is more associated with the net availability of alcohol than with the mix of licensed premises. A desire to increase the mix of types of licensed premises in a defined area would ideally be balanced by a reduction in the existing types of licensed premises, rather than adding to them (which increases the net availability).
- The density of alcohol outlets in a defined area should be restricted, which is of particular benefit for residents who live in the immediate area of licensed premises.
- There is a clear relationship between trading hours and harms. Specifically, the longer hotels and other licensed venues are allowed to be open, the more problems will result. Consequently, the number of late night trading venues, including 24-hour licenses, needs to be restricted.
- RSA training should only be supported and encouraged if local authorities have the capacity and the desire to enforce and monitor it.
- Despite the current weak evidence base, it is likely that alcohol-related harms will be optimally reduced by involving a wide range of relevant groups in the local area working together systematically. Such groups would include local government, police, hospitals and allied health services, licensees, high schools, local courts and non-government organisations that work with high-risk groups, such as young people who have dropped out of school.

Although not specifically looked at in this review (because they have not been sufficiently and systematically evaluated), a number of strategies have been implemented around closing times of hotels, in an effort to reduce the occurrence of alcohol-related harms. The major focus of these strategies is that they can support and help make it easier for police and security staff to work

with intoxicated patrons. Although the following currently have an insufficient evidence-base, they may be worth implementing, but only if they are rigorously evaluated:

- Improved lighting in areas where alcohol-related crime has been shown to occur and closed circuit cameras. However, if implemented in isolation from other strategies this may simply shift undesirable behaviour to other locations.
- Alcohol-free zones. Again, if implemented in isolation from other strategies, this is likely to simply shift undesirable behaviour to other locations, but it may assist police and security staff to confiscate alcohol and move patrons back inside hotels or towards transport facilities.
- Improved transport options, including subsidised taxi fares and dedicated buses.
- Staggered closing times.
- High visibility policing at closing times.
- Cessation of serving at some time point prior to closing (eg. 30 minutes). Anecdotal evidence also suggests playing quieter music in the lead up to closing can be effective.
- Lock-outs (that is, preventing entry into an establishment after a certain hour) at an agreed time for all licensed premises in a defined and geographically proximal area. There is some anecdotal support that this has been effective in reducing rates of alcohol-related harm in Manly and it appears to be a popular strategy with police. The May 2008 meeting of the Ministerial Council on Drug Strategy (MCDS) resolved to review the evidence on lock-outs.

Putting the evidence together in a coherent package

Based on the evidence base to date, as outlined in the literature search above, strategies aimed at reducing alcohol-related harm that are most amenable to Local Government action are essentially aimed at restricting the availability of alcohol: the number of alcohol outlets (the greater the net availability of alcohol, the greater the likely harms); the density of alcohol outlets within defined areas (the greater the density the greater the harms, especially in areas immediately surrounding alcohol outlets); and trading hours (the later hotels are open the greater the number of harms). But the reality is that these strategies will need to be tailored to defined areas and that means achieving a balance between net availability of alcohol, density, trading hours; a balance that will differ between areas. For example, an area with a large number of licensed venues may need to balance that by restricting the number of them that are able to open late, or ensuring the density of outlets does not increase. Another area may have a large number of late night trading venues, which could potentially be balanced by restricting the number of alcohol outlets allowed to operate. The success with which other countries have managed to achieve this balance is explored in the next section.

2.3 Responding to alcohol harms: international experiences

2.3.1 Case study 1: Ealing town centre. The cumulative impact of pubs, clubs and restaurants

This study provided a snapshot of the Ealing town centre area between 2002 and 2003, where 'cumulative impact of pubs, clubs and restaurants' was defined as "the concentration of many licensed premises in a defined area and the associated impacts of crime, public disorder and nuisance that are above acceptable levels, and beyond the proper control and management of licensees, police, the local authority and other agencies".

The study attempted to acquire data on primary indicators to indicate whether a saturation point had been reached. Maps were utilised to assess the location (and time) of offences which had occurred across the borough and town centre, and to assess the proximity of these offences to licensed premises (locations of which were also plotted on the maps).

Additionally, the study summarised relevant policies and recent development applications for licensed premises while surveys of residents, businesses and community groups on the future development of the town centre were also conducted.

Licensed premises were largely concentrated in the town centre, and it was found that robbery, violence against the person, disturbances in a public place, disturbances in a licensed premises and drunkenness were all concentrated in this area. Most incidents occurred within 0-25 metres of a licensed premise. This finding is consistent with the evidence that residents living closer to alcohol outlets experience more harms (Donnelly *et al.*, 2006).

Criminal damage and noise were more widespread issues, as were drug offences (although data for the latter offence related to the police station where the offender was searched, not necessarily where the incident took place). The number of incidents and licensed premises were compared across five zones within the town. This provided evidence of cumulative impact/saturation point in two of the zones. Other comparisons included entertainment uses, number of licensed premises, and floor space ratios across London's ten metropolitan centres. This showed Ealing to be unique. Limiting factors included parking, public transport, congestion, street cleaning and public space. Completion of pedestrian footfall survey over consecutive Friday and Saturday nights in 3 locations to look at numbers of people, queues, anti-social behaviour.

Summary of Ealing case study

The literature review in Section 2.2, identified that in relation to availability of alcohol, the likely factors that increase alcohol related harm are a high number of alcohol outlets, a high density of alcohol outlets, and late-night trading hours. The practical experience of Ealing reflects this evidence:

- High density. Licensed premises were largely concentrated in the town centre, and it was found that robbery, violence against the person, disturbances in a public place, disturbances in a licensed premises and drunkenness were all concentrated in this area.
- Number of alcohol outlets. In two defined zones, the number of adverse incidents increased as a function of the number of licensed premises. That this was not the case in the other three zones examined reflects the importance of the need to tailor strategies to specific areas: clearly in two zones in Ealing there are too many licensed premises, while the number of licensed premises in three zones is either within acceptable levels, or the adverse effects of a large number of licensed premises is mitigated by confounding factors (eg. less density of licensed premises or relatively few late night trading premises).

2.3.2 Case study 2: Shoreditch night-time economy study, 2007

The London antisocial behaviour strategy recognised that street drinking, rowdy behaviour, drunkenness and disorder are all factors that stop people using public spaces. Responding to this, the Shoreditch evidence-based review examined the effects of the special policy introduced in this area in 2004, aptly named the Special Policy Area (SPA). The study, completed in 2004, can be summarised as follows:

- A review of policy, legislation and literature. This review described good practice, including Responsible Service of Alcohol initiatives, providing snacks, discouraging happy hours, the development and implementation of the *"Shh Shoreditch Campaign"*, drink spiking awareness, and use of detection devises, such as metal detectors and cocaine wipes. It also sought to identify gaps in public transport that may impact on rates of alcohol-related harm.
- Acquisition of detailed information on the location, type and opening hours of night time uses. This information included a mapping exercise to examine the effect of a policy introduced in 2005 to limit the number of approvals for extended alcohol trading venues.
- Crime data collection involved a review of relevant crime statistics and a late night site visit with police. The principal findings were:
    - Significantly higher proportion of common assault and wounding in SPA than borough as whole (especially on weekends);
    - The most common time for alcohol-related incidents in the SPA is midnight-4am, when levels are 4 times higher than during the day. Similarly, thefts, including pick pocket incidents, are most common in the SPA between 11pm-3am;
    - The day and time of incident suggest that the level of common assault, wounding, pick pocketing and theft in the SPA are strongly related to night-time economy activity (nb in part due to large numbers of people in the area at those times);
    - Overall crime rates for violence and theft were higher for 2006/7 than 2003/4. This suggests that the interventions trialled in the Shoreditch SPA were not successful. This is consistent with the literature, in that the strategies trialled (Responsible Service of Alcohol initiatives, providing snacks, discouraging happy hours, the

development and implementation of the *"Shh Shoreditch Campaign"*, drink spiking awareness, and use of detection devises) do not have evidence of their effectiveness.

- Community consultation. This involved a number of strategies, as follows:
  - A noise study found that the number of noise complaints fell significantly since 2004. This may reflect the interventions put in place in the SPA, but more likely reflects that Shoreditch residents used the Shoreditch night-time economy less frequently, instead preferring to travel to other areas in Hackney;
  - Meetings with key-stakeholders, phone interviews with 250 residents (noted that this sample may have been skewed to older residents as younger residents use mobile phones not land lines), interviews with 100 members of the community over two evenings and interviews with 10 licensees. The principal findings from these strategies were that Shoreditch residents were using the night-time economy less frequently, but that residents' perceptions of the night-time economy were more positive. Here was a decrease in the proportion of residents and key-stakeholders who reported that the night-time economy was disruptive, complemented by an increase in those wishing to see no further growth.

Summary of the Shoreditch case study

The apparent lack of effectiveness of the SPA project is most likely due to at least two factors.

- First, the strategies employed (Responsible Service of Alcohol initiatives, providing snacks, discouraging happy hours, the development and implementation of the *"Shh Shoreditch Campaign"*, drink spiking awareness, and use of detection devises) are inconsistent with research evidence about what actually works. These strategies are easier to implement, but they have been shown to be of limited effectiveness.
- Second, the issues that research shows are linked to increases in alcohol related harm (a greater number of alcohol outlets, a greater density of alcohol outlets and a greater number of late-night trading venues) were not addressed. Indeed, these factors appear to have increased: after the introduction of the SPA in 2004, another six extended trading licenses were granted (although this was a capped number, it still represents an increase); there has been minimal growth in businesses within the SPA since 2004, but that growth was predominantly in bars and restaurants; and the development and introduction of a large hotel just outside the SPA.

2.4 Responding to alcohol harms: Council of the City of Sydney Local Government Area

Prior to examining the data specific to, and the implications of the international experience for, the Council of the City of Sydney, it is important to review current and recent activity auspiced by the Council of the City of Sydney to ensure any recommendations are consistent with existing strategic directions.

2.4.1 Kings Cross licensed premises research (Urbis JHD, September 2006)

This report presented findings on the effects of late night licensed premises in Kings Cross, based on limited data from police, complemented by City of Sydney auspiced interviews and analysis. The overall methods included:

- A review policy documents, population statistics and crime statistics.
- A review of relevant case studies (eg. Stonnington, Victoria and Ealing, UK).
- Interviews with eight stakeholders, including representatives from NSW Police, Bureau of Crime Statistics and Research (BOCSAR) and Non-Government organisations (eg. the Wayside Chapel).
- Geographic mapping of licensed premises and land use.

The principal findings can be summarised as follows:

- Late night venues were generally thought to add colour, vibrancy and activity to the Kings Cross area.
- There is a mix of business types in the area:
    - 15% of businesses are licensed premises, comprising restaurants (n=32), hotels (n=12), nightclubs (n=8), theatres (n=8) and other license types (n=5).
    - As a percentage of the total number of businesses: restaurants 9%, accommodation 8%, hotels 3%, clubs 2%, adult industry 2%, bars 1%;
    - 19 venues with a 24 hour licence were identified, of which three stay open for 24 hours while the remainder close for an hour for cleaning. These closing times are generally staggered to avoid large numbers of intoxicated people exiting from

- Crime data indicated a clear relationship between reported incidents and early hours of the morning. More specifically:
    - Assaults and stealing were found to have strong relationship with alcohol: the most common crime reported June 04-July 06 was assault, of which most occurred outside licensed premises between 8pm – 7am on weekends.
    - Stealing increased on weekends.
    - Problems also identified with under-age drinking, noise disturbance and lack of public transport.
    - Kings Cross command area has nearly double the state average for licensing breaches and detection of licence violations
- Visitor and worker numbers in the Kings Cross area are much greater than resident numbers, which may have some bearing on both the rates of adverse incidents and the number of resident complaints.

Summary of the Kings Cross licensed premises research

As was the case for Ealing, the types of crimes and disturbances reported in the Kings Cross licensed premises research, and their relatively high prevalence, are consistent with the research evidence that a relatively high densities of alcohol outlets, along with a high proportion of late-night trading venues, are associated with increased rates of alcohol-related crime (Donnelly *et al.*, 2006; Chikritzhs and Stockwell, *in press*; Briscoe and Donnelly, 2001; Briscoe and Donnelly, 2003).

2.4.2 Discussion paper "Night Trading Premises July 2006 City of Sydney" and the "Oxford Street Safety Strategy 2007-2010"

These discussion papers describe the existing controls, policies and harm minimisation strategies in place in the City of Sydney Local Government Area. It was written in order to inform the subsequent development of a Development Control Plan for Night Trading Premises.

The report highlights the views, or likely views, of various regulatory authorities, including:

- The Land and Environment Court. The Court tends to take the view that longer trading hours are appropriate in areas with a significant presence of late trading entertainment venues (eg Kings Cross). Also the court has recognised the importance of 'transitional' buffers between areas of high activity and residential areas.
- Police. Predominantly of the view that extended hours should be seen as a privilege, not a right, and licensees have responsibility to clientele and residents. In addition:
    - Night trading policy should try to address 'ambient safety' (eg streets surrounding venues);
    - There should be one year trial periods with normal trading hours;
    - A diversity of night trading premises should be encouraged.

The report also discusses a number of terms and concepts, which are not widely articulated in the research literature. These terms include the concept of 'entertainment precincts' (The Rocks, Darling Harbour, Chinatown, George St, Oxford St, Kings Cross); 'crime hot spots'; 'good venue management'; 'cumulative impact'; 'stress areas'; 'land use conflict'; and 'saturation level'.

Finally, brief descriptions of management plans in other cities are provided, including Brisbane, Melbourne, London, Stonington (in Melbourne), and the draft South Sydney development control plan is attached as an appendix.

Summary of theses discussion papers

This report raises a number of issues of concern, in that the views apparently held by those in potential powerful positions, in terms of influencing the mix of businesses in defined areas, appear inconsistent with the research literature. In particular:

- If the Land and Environment Court does indeed hold the view that longer trading hours are appropriate in areas with a significant presence of late trading entertainment venues, this runs counter to the research evidence that says late night trading venues, and a greater density of alcohol outlets in a defined area, are both strongly associated with increased rates of alcohol-related crime. This suggests some liaison with Court officials may be worthwhile.
- Although the apparent willingness of police to support trials of normal trading hours is a sensible approach, their apparent encouragement for a greater variety of venues may need to be qualified: whatever the merits of a greater diversity of alcohol outlets, this is likely to lead to an increase in alcohol-related crime and disturbances, if it is associated with an increase overall net availability of alcohol, the density of alcohol outlets or the proportion of late night trading venues.
- The key terminology used in the report needs to be carefully defined.

2.4.4 Summary for City of Sydney Local Government Area

The literature review conducted for this report can be distilled into key points:

- With respect to City of Sydney Local Government Area, there appears to have been an increase in the density of alcohol outlets in defined areas (eg. Kings Cross and the city), including an increase in the number of late night trading premises. The extent to which this increase in availability has led to an increase in alcohol-related harms has not been quantified adequately, although the literature clearly indicates that an increase in alcohol-related harm is associated with increased density of licensed premises, longer trading hours and an increase in net availability of alcohol via more licenses, irrespective of their license type. Data from the Ealing case study, as well as previously published Australian data, clearly show this relationship.
- Associated with an increase in applications for alcohol outlets over time, City of Sydney council has taken a number of steps to achieve an optimal balance between various interests and minimising alcohol-related harm, such as the "Late Night Premises Development Control Plan". The extent to which these strategies have led to a decrease in alcohol-related harm is not clear from empirical data.
- A number of strategies have been shown to reduce alcohol-related harm, primarily increases in the price of alcohol, mandatory advertising restrictions and reduced availability of alcohol. Of these, the latter is most amenable to Local Government Action. Although greater restrictions on alcohol are often the most difficult strategies to implement, partly due to resistance from the alcohol industry, and partly due to a lack of clarity about which strategies increase and decrease harm (eg. the apparent view of the Land and Environment Court that is counter to the evidence), the Shoreditch case study clearly demonstrates that implementing easier but less effective strategies is unlikely to achieve significant reductions in alcohol-related harm.
- In line with council concerns that an alcohol harm saturation point has been reached in two defined areas (Kings Cross and Darlinghurst), Council refused to approve an additional licence for a late night trading hotel, a decision which was successfully challenged in the Land and Environment Court. A principal recommendation from the Court was that more rigorous analyses were required in order to more strongly

demonstrate the relationship between an increase in alcohol availability and resultant harms.

- Therefore, an important requirement is for a methodologically rigorous analysis of alcohol harm data in defined areas perceived as problematic, in order to examine the statistical relationship between increased alcohol availability and resultant harm, as well as to attempt to determine if there is any evidence that the mix of alcohol outlets in a defined area impacts on resultant harms.

3. DATA ANALYSES

3.1 Introduction

Alcohol-related harm can be quantified in a number of complementary ways: emergency department presentations, crime data, ambulance incidents and traffic accidents. Previous research has examined the relationship between alcohol outlets and each of these harmful outcomes. For example, Poynton and colleagues (2005) estimated the proportion of alcohol-related presentations to an inner city hospital emergency department, as well as the resultant costs. Similarly, alcohol-related crime rates have been estimated for defined Local Government Areas in Sydney, including inner Sydney (Briscoe and Donnelly, 2003).

Although these estimates are useful in quantifying the likely extent of alcohol-related harm within defined geographical areas, their major limitation is that they do not allow adequate examination of trends over time, or between different geographical areas, because of the high probability that harms are recorded differently by different police (eg. as police personnel move in and out of stations, crimes identified as alcohol-related would be likely to vary due to different officers and commanders having different priorities). Another limitation relates to the accuracy of what is routinely recorded: generally studies show that rates of alcohol-related harm are typically much greater than is routinely recorded in existing data collection systems.

These limitations initiated attempts to refine existing data sets to make them more useful in determining the impact of interventions or policy changes. The most advanced of these relates to alcohol-related crime. Nationally, Australian research has developed a method of estimating rates of alcohol-related crime. Although this methodology almost certainly underestimates the true extent of alcohol-crime, it provides a much more accurate examination of changes over time and comparison between different geographical areas. This method has recently been adapted and applied to specific settings in NSW (Breen *et al.*, under review), providing a clear example of the practicality and applicability of this methodology.

3.2 Aims

This section has three aims:

1. To compare rates of alcohol-related harm in Kings Cross and Darlinghurst, and between these two areas and other defined areas within the City of Sydney and defined areas in greater Sydney.

2. To quantify the relationship between the increase in outlets over time and an increase in alcohol-related crime in different defined areas within the City of Sydney and in other defined areas in greater Sydney.

3. To determine if there is a statistically significant relationship between alcohol-related harm, and type or density of licensed premises in the City of Sydney Local Government Area.

3.3 Method

3.3.1 Areas selected

The areas of interest (study sites) are Kings Cross and Darlinghurst. Appendix A shows the geographical boundaries of Kings Cross and Darlinghurst. In order to be comparable across sites, and to maximise comparability between regions and recorded alcohol-related crime, the definition of these areas is restricted to their postcodes: 2010 (includes the suburbs of Darlinghurst and Surry Hills); and 2011 (includes the suburbs of Kings Cross, Woolloomooloo, Elizabeth Bay, Potts Point, Rushcutters Bay).

A number of comparison areas have been identified for different purposes. In order to establish whether trends in alcohol-related crime are increasing across a number of defined areas within City of Sydney LGA, as well as different LGAs in the Sydney Metropolitan region, each of the following postcode areas are included for specific sets of analyses: 2000 (Sydney City, including Dawes Point, Haymarket, Millers Point and The Rocks); 2009 (Pyrmont); 2042 (Newtown and Enmore); 2037 (Glebe and Forest Lodge); 2034 (Coogee and South Coogee); 2026 (Bondi) and 2095 (Manly).

3.3.2 Measures

Licensed premises

Historical records were obtained from City of Sydney to track the growth of licensed premises overall, and late night trading premises, in selected LGAs within the City of Sydney Local Government Area.

Crime data source

The data used for these descriptive analyses came from de-identified, unit record, police data on recorded criminal incidents (except murder which is recorded victims) for all the suburbs between January 2001 and September 2007, were provided by the NSW Bureau of Crime Statistics and Research (BOCSAR). Incidents were selected on the basis of the postcode in which they occurred, rather than another measure of location, such as local government area, or another measure of persons involved, such as the residential postcode of the person of interest, in order to increase the likelihood that the incident impacted on local services (such as police resources and health care services). The date the incident occurred was used, rather than the date the incident was reported, in order to ensure the incident fell within the timeframe appropriate to the conduct of these analyses.

Definition of a criminal incident

Defining a criminal incident is not straight-forward, because one incident may involve more than one offender or more than one victim. Alternatively, more than one incident may be recorded, even if the same offender and victim were involved. For example, a man reports to police that his neighbour was damaging his property and, when confronted, the neighbour assaulted him. Two criminal incidents are recorded because two distinct offence categories are involved (malicious damage to property and assault), even though the same victim and same offender were involved and the incidents occurred at the same time. Given this, a criminal incident is defined as an activity detected by, or reported to, police which: involves the same offender(s); involves the same victim(s); occurred at one location; occurred during one interrupted period of time; falls into one offence category; or falls into one incident type (eg. ‘actual’, ‘attempted’, ‘conspiracy’).

The surrogate measure of alcohol-related crime

The validity of alcohol-related crime has been difficult to establish. Comparing across defined geographical areas is less susceptible to problems of validity, assuming the same measure is

applied to both the intervention and control groups at both pre- and post-test: whatever inaccuracies exist in the measure ought to be comparable across comparison groups. The reliability of a measure presents a greater problem: it is likely that conducting an intervention could change the reporting behaviour of police, irrespective of actual changes. There are numerous documented examples of increased enforcement activity resulting in an increase in recorded violence (e.g. Putnam, Rockett, & Campbell, 1993; Burns et al., 1995; Hawks et al., 1998).

One way to improve reliability is to use a surrogate definition, which focuses on a sub-set of crimes occurring in a defined time period, regardless of whether police have reported the incident as alcohol-related. A surrogate approach was developed on a national level in Australia (Mathews et al., 2002) and has since been adapted and applied to the cities of NSW for the purposes of this paper (Breen et al., under review).

Crimes included in the surrogate measure for alcohol-related crime

Consistent with Mathews et al. (2002) and Breen et al. (2011), only serious assaults were included: common assault; actual or grievous bodily harm; aggravated assault; assault with an offensive weapon; and driving causing bodily harm, death or wounding.

Since the narrowness of the national surrogate measure (Mathews et al., 2002) is largely dictated by which data are available nationally, adding crimes that are of concern to local communities seems reasonable both in principle (providing a wider group of anti-social behaviours to attempt to reduce) and methodologically (it does not introduce excessive variability in the measure (Breen et al., in press)). Consequently, this analyses also includes common assault and malicious damage (graffiti, malicious damage to property and public place offences, including damage to fountain/wall, shrine or monument).

Surrogate times: alcohol and non-alcohol times

Times in which injuries are most likely to be alcohol-related, and are most unlikely to be alcohol related, have been defined for Australia (Chikritzhs, Stockwell et al., 2000). Alcohol-related times are: Sunday 10pm - Monday 6am; Monday 10pm - Tuesday 2am; Wednesday 10pm – Thursday 2am; Friday 10pm – Saturday 6am; and Saturday 6pm - Sunday 6am. Non-alcohol-

related times are: Monday 6am - Monday 6pm; Tuesday 6am - Tuesday 2pm; Wednesday 10am - Wednesday 2pm; Thursday 6am – Thursday 2pm; and Friday 6am - Friday 10am.

3.3.3 Statistical analyses

Ratio analysis

The geographical areas are compared in terms of their ratios for the number of surrogate incidents that occur in alcohol related times, relative to the number of surrogate incidents that occur in non-alcohol related times. Using this ratio approach controls for a number of exogenous factors, including unobserved factors, which may influence the general level of crime in different geographical areas, which would impact on the comparisons for alcohol-related crime. That is, the effect of alcohol availability in a community is likely to be larger in absolute terms for those areas with strong, pre-existing, underlying levels of crime (where alcohol use is more likely to result in crime because of the relatively high base rate of criminal activity). Therefore, the ratio approach increases confidence that the comparisons between defined areas, and over time, are specific to alcohol-related crimes, rather than being unduly influenced by co-existing factors.

Presentation of the results

Due to the nature of the data, standard error bars and 95% confidence intervals around ratios for number of surrogate incidents that occur in alcohol related times over the number of surrogate incidents that occur in non-alcohol related times were taken into account. These figures were generated for the majority of the graphs to provide sufficient information about the degree of uncertainty around each of the estimates. This allowed for some comparison across January 2001-September 2007. For statistical verification, a two sample t-test was used as an approach to compare multiple means of ratios from the independent city groups.

In addition, a one-way ANOVA was used to test for a difference in mean ratio of alcohol related incidents to non-alcohol related incidents. In order to identify specifically between differences of ratios across time for each city and maintain a significance level of 0.05 for the multiple comparisons, a Tukey's post hoc procedure was used because the sample sizes were equal among the nine various city suburbs. For the univariate measures, Shapiro-Wilk tests reported a p value > 0.05 with similar mean and medians to suggest the data is normally distributed and hence a parametric test may be more appropriate.

3.4 Results

3.4.1 Areas selected and their relevant characteristics

Population estimates
The population estimates of all selected areas are summarised in Table One.

Table 1: Population estimates of selected areas

		POPULATION FIGURES*							% change
Area	**Postcode**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007***	
Sydney	2000	16,302	17,322	18,341	19,361	20,380	21,400	22,420	+ 27.3
Pyrmont	2009	7,618	8,357	9,096	9,834	10,573	11,312	12,051	+ 36.8
Darlinghurst	2010	22,864	23,217	23,571	23,924	24,278	24,631	24,984	+ 8.5
Kings Cross	2011	16,180	16,491	16,802	17,114	17,425	17,736	18,047	+ 10.3
Bondi	2026	29,663	29,714	29,766	29,817	29,869	29,920	29,971	+ 1.2
Coogee	2034	18,837	18,776	18,715	18,654	18,593	18,532	18,471	0.0
Glebe	2037	13,040	13,126	13,211	13,297	13,382	13,468	13,554	+ 3.8
Newtown	2042	14,776	15,081	15,385	15,690	15,994	16,299	16,604	+11.0
Manly	2095	14,109	14,077	14,045	14,013	13,981	13,949	13,917	0.0

** These estimates derive from the 2001 ABS community profile data, and the 2002-2006 ABS Quickstats. The Postcodes equate to the place of usual residence.*

Number of licensed premises
The number of licensed premises in all selected areas are summarised in Table Two.

Table 2: Number of licensed premises in selected areas

Area	**Postcode**	**2001**	**2005**	**2008**	**% change 2001-2008**
Sydney	2000	706	846	744	+ 5.1
Pyrmont	2009	51	66	76	+ 32.9
Darlinghurst	2010	144	218	229	+ 37.1
Kings Cross	2011	144	108	137	- 5.1
Bondi	2026	71	88	89	+ 20.2
Coogee	2034	25	30	32	+21.9
Glebe	2037	51	56	49	- 4.1
Newtown	2042	61	77	83	+ 26.5
Manly	2095	81	95	89	+ 9.0

** These data derive from the Office of Liquor, Gaming and Racing Index for NSW*

Relevant characteristics
The alcohol-crime relevant characteristics of all selected areas are summarised in Appendix B.

Alcohol-related crime rates

The alcohol-related crime rates per 1,000 population for all areas, by year, are summarised in Tables Three to Eight.

Table 3: Alcohol-related crime rates per 1,000 population for 2001.

	2001			
	Alcohol offences	**All offences**	**Population**	**Rate**
Sydney	953	2637	16,302	0.36140
Pyrmont	211	426	7,618	0.49531
Darlinghurst	557	1887	22,864	0.29518
Kings Cross	410	1308	16,180	0.31346
Bondi	298	836	29,663	0.35646
Coogee	217	528	18,837	0.41098
Glebe	180	723	13,040	0.24896
Newtown	149	584	14,776	0.25514
Manly	293	681	14,109	0.43025

Table 4: Alcohol-related crime rates per 1,000 population for 2002

	2002			
	Alcohol offences	**All offences**	**Population**	**Rate**
Sydney	1049	2832	17,322	0.37041
Pyrmont	277	532	8,357	0.52068
Darlinghurst	557	1795	23,217	0.31031
Kings Cross	437	1292	16,491	0.33824
Bondi	295	911	29,714	0.32382
Coogee	202	522	18,776	0.38697
Glebe	169	681	13,126	0.24816
Newtown	181	670	15,081	0.27015
Manly	265	622	14,077	0.42605

Table 5: Alcohol-related crime rates per 1,000 population for 2003.

	2003			
	Alcohol offences	All offences	Population	Rate
Sydney	1240	3137	18,341	0.39528
Pyrmont	280	527	9,096	0.53131
Darlinghurst	486	1551	23,571	0.31335
Kings Cross	413	1214	16,802	0.34020
Bondi	293	844	29,766	0.34716
Coogee	241	520	18,715	0.46346
Glebe	142	614	13,211	0.23127
Newtown	183	646	15,385	0.28328
Manly	349	701	14,045	0.49786

Table 6: Alcohol-related crime rates per 1,000 population for 2004

	2004			
	Alcohol offences	All offences	Population	Rate
Sydney	1216	3092	19,361	0.39327
Pyrmont	209	451	9,834	0.46341
Darlinghurst	575	1849	23,924	0.31098
Kings Cross	481	1241	17,114	0.38759
Bondi	290	748	29,817	0.38770
Coogee	236	499	18,654	0.47295
Glebe	158	616	13,297	0.25649
Newtown	183	661	15,690	0.27685
Manly	435	786	14,013	0.55344

Table 7: Alcohol-related crime rates per 1,000 population for 2005

	2005			
	Alcohol offences	All offences	Population	Rate
Sydney	1552	3427	20,380	0.45287
Pyrmont	234	467	10,573	0.50107
Darlinghurst	568	1756	24,278	0.32346
Kings Cross	595	1442	17,425	0.41262
Bondi	325	827	29,869	0.39299
Coogee	274	581	18,593	0.47160
Glebe	133	537	13,382	0.24767
Newtown	210	656	15,994	0.32012
Manly	551	882	13,981	0.62472

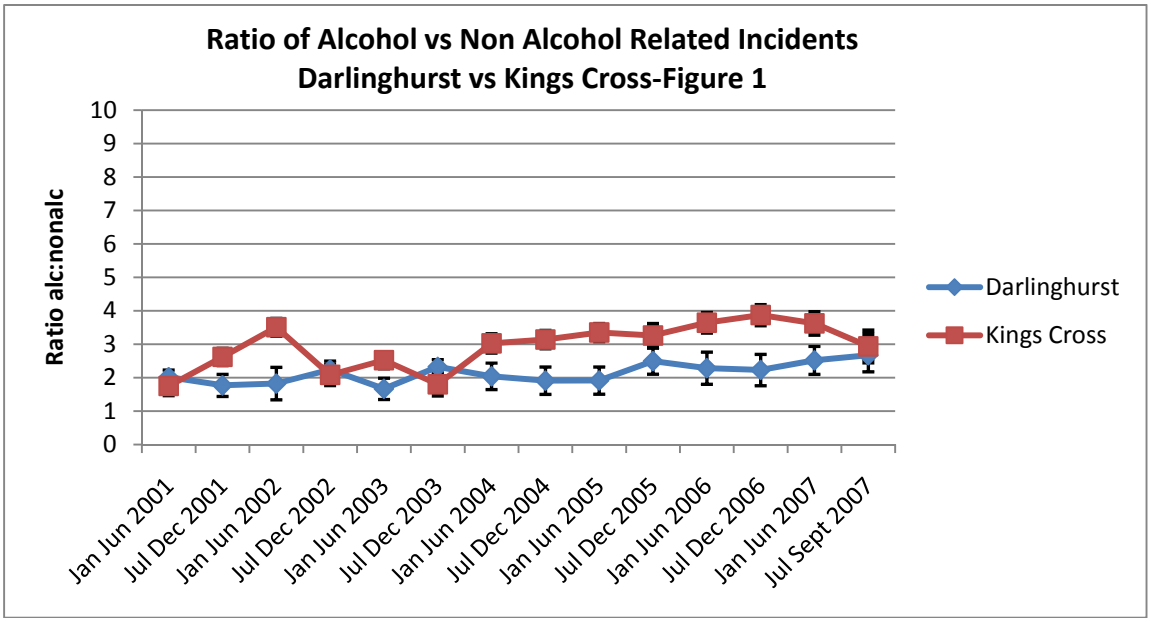
Table 8: Alcohol-related crime rates per 1,000 population for 2006

	2006			
	Alcohol offences	All offences	Population	Rate
Sydney	1546	3410	21,400	0.45337
Pyrmont	180	395	11,312	0.45570
Darlinghurst	612	1768	24,631	0.34615
Kings Cross	599	1401	17,736	0.42755
Bondi	356	960	29,920	0.37083
Coogee	268	584	18,532	0.45890
Glebe	149	578	13,468	0.25779
Newtown	241	719	16,299	0.33519
Manly	494	859	13,949	0.57509

3.4.2 Alcohol-related ratios over time, within and across study sites

Kings Cross and Darlinghurst
For Kings Cross and Darlinghurst (study sites), changes in alcohol-related crime over time are given in Figure One.

Figure 1: Ratio of alcohol-related incidents to non-alcohol-related incidents, 2001-2007: Darlinghurst versus Kings Cross



nb: the reduction evident in the last time period reflects the data cut-off date of September 2007 (as opposed to December 2007), not a reduction in alcohol-related crime. The expected ratio as at the end of December 2007 would be close to 3 for Darlinghurst and 4 for Kings Cross.

Figure 1 shows that for Darlinghurst and Kings Cross, the mean and median of the ratio for the number of incidents that occurred in alcohol related times over the number of incidents that occurred in non-alcohol related times are very close to one another, ranging from 1.67-2.67 and 1.75-3.87, respectively. The mean alcohol versus non alcohol related ratio in Darlinghurst (2.14) is 1.22 times lower than in Kings Cross (2.94) from January 2001 to September 2007. It appears from these results that a parametric test is the most appropriate. As a result, a two sample t-test was conducted to determine if there was a significant difference in the ratio for Darlinghurst compared to Kings Cross (Shapiro Wilk $p > 0.05$). We can conclude there is a significant difference in the distribution of the ratios for the number of incidents that occurred in alcohol related times compared to the number of incidents that occur in non alcohol related times between Kings Cross and Darlinghurst ($p=0.0005$) across the past seven years at the 0.05 level. Specifically, there has been more alcohol-related crime in Kings Cross than Darlinghurst

Kings Cross and Darlinghurst vs other City of Sydney areas

Figure 2 compares ratios of alcohol-related crime in Kings Cross and Darlinghurst to other defined regions within the City of Sydney LGA.

Figure 2: Ratio of alcohol-related incidents to non-alcohol-related incidents, 2001-2007: Darlinghurst and Kings Cross versus Sydney LGAs

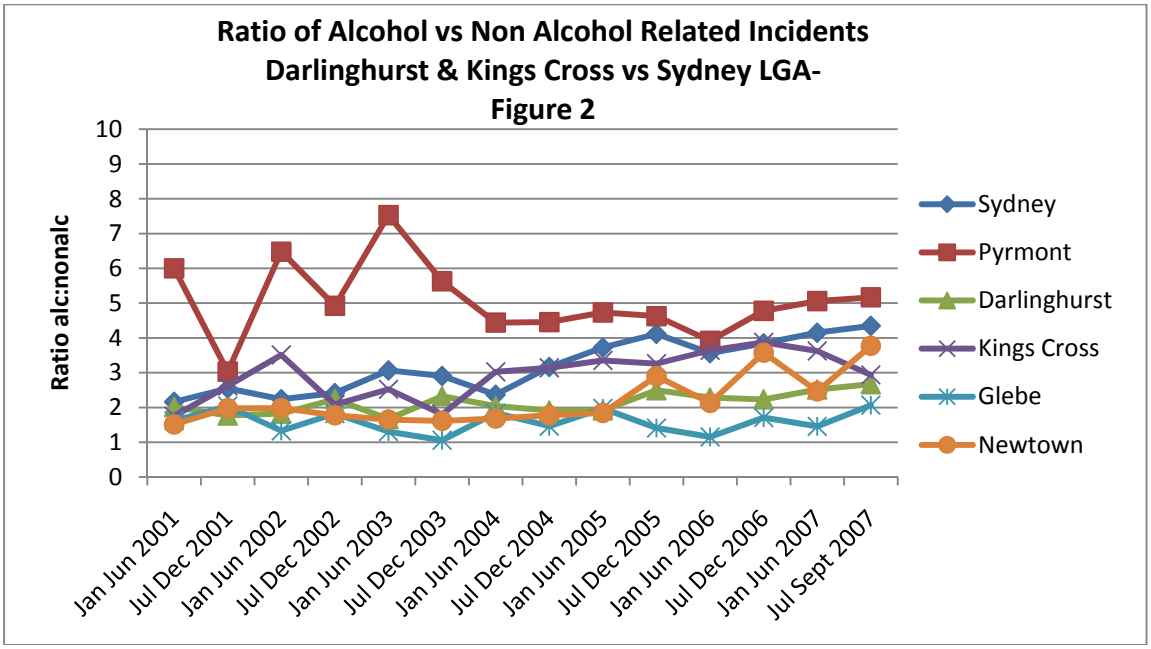


Table 9: Results of tests of statistical significance: Kings Cross and Darlinghurst vs City of Sydney LGAs

Category Comparison	Difference between means	95% CI	Significance
Sydney vs. Pyrmont *(1 vs 2)*	1.87	[1.08, 2.65]	<0.0001
Pyrmont vs. Kings Cross *(2 vs 4)*	2.12	[1.33,2.9]	<0.0001
Pyrmont vs. Newtown *(2 vs 6)*	2.87	[2.08,3.65]	<0.0001
Pyrmont vs. Darlinghurst *(2 vs 3)*	2.92	[2.13,3.70]	<0.0001
Pyrmont vs. Glebe *(2 vs 5)*	3.47	[2.68,4.25]	<0.0001
Sydney vs. Newtown (1 vs 6)	1.00	[0.21,1.78]	<0.0001
Sydney vs. Darlinghurst (1 vs 3)	1.05	[0.27,1.83]	<0.0001
Sydney vs. Glebe *(1 vs 5)*	1.60	[0.81,2.38]	<0.0001
Kings Cross vs. Darlinghurst *(4 vs 3)*	0.80	[0.02,1.59]	<0.0001
Kings Cross vs. Glebe *(4 vs 5)*	1.35	[0.57,2.13]	<0.0001

In order to determine whether mean ratio differed across each defined area, a one-way analysis of variance (ANOVA) was employed (Shapiro Wilk p >0.05). There was a statistically significant difference in the overall ratio between the areas compared ($p<0.0001$) at the 0.05 level. In order to identify specific between area differences, a Tukey's post hoc procedure was utilised.

The mean ratio for the number of incidents that occurred in alcohol related times over the number of incidents that occurred in non-alcohol related times was statistically significantly different in Sydney (3.19) compared to that in Pyrmont (5.05) from January 2001-September 2007 at the 0.05 level. Specifically, the count ratio of incidents that occurred in alcohol related times over incidents that occurred in non alcohol related times in Pyrmont was statistically significantly higher than in Sydney ($p<0.0001$).

The ratio was found to be statistically significantly higher in Sydney (3.19), compared to that in Newtown (2.19), Darlinghurst (2.14), and Glebe (1.59) ($p<0.0001$). Finally, the ratio was found to be statistically significantly higher in Kings Cross (2.94) than in Darlinghurst (2.14) and Glebe (1.59) ($p<0.0001$).

In addition, the number of incidents that took place in alcohol related times over the number of incidents that occurred in non-alcohol related times in Pyrmont (5.05) was found to be statistically significantly higher compared to that in Kings Cross (2.94), Newtown (2.19), Darlinghurst (2.14) and Glebe (1.59) across the past seven years($p<0.0001$). The model accounted for 72.8% of the variability in mean ratio, based on crime included in the surrogate measure for alcohol related times and non alcohol related times. The variability does not include the number of venues in a defined LGA,nor operating hours (see Appendix B).

Pair-wise comparisons between Sydney vs. Kings Cross, Kings Cross vs. Newtown, Darlinghurst vs. Newtown, Glebe vs. Newtown, and Darlinghurst vs. Glebe were found not to be statistically significant.

Kings Cross and Darlinghurst vs LGAs in greater Sydney

Figure 3 compares ratios of alcohol-related crime in Kings Cross and Darlinghurst to other defined regions in greater Sydney.

Figure 3: Ratio of alcohol-related incidents to non-alcohol-related incidents, 2001-2007: Darlinghurst and Kings Cross versus greater Sydney LGAs

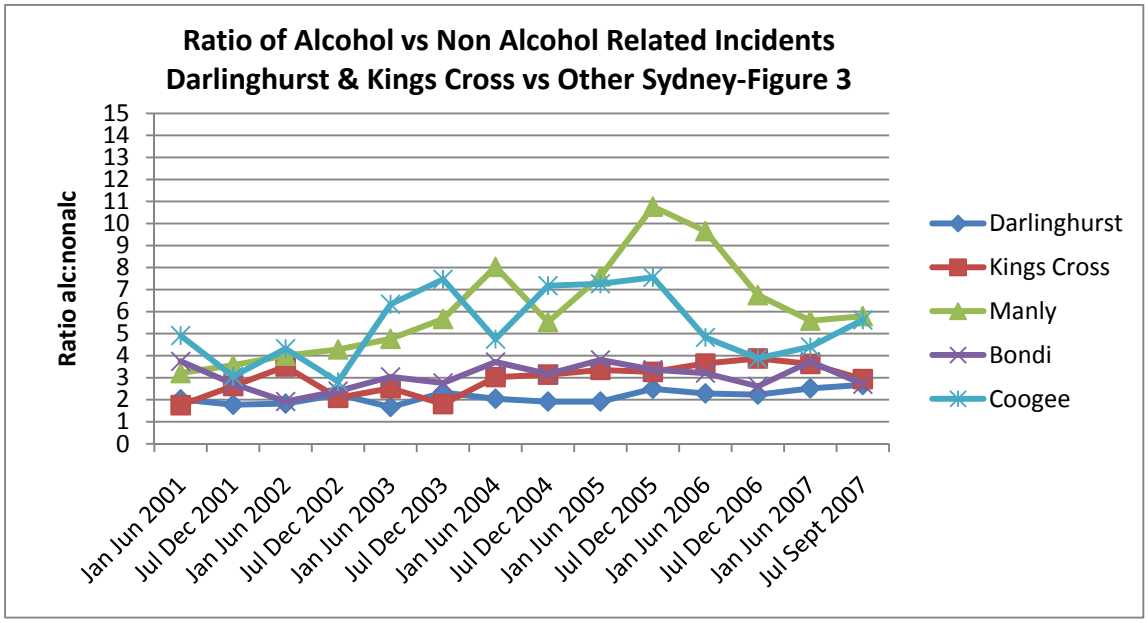


Table 10: Results of tests of statistical significance: Kings Cross and Darlinghurst vs greater Sydney LGAs

Category Comparison	Difference between means	95% CI	Significance
Manly vs. Bondi *(7 vs 9)*	3.02	[1.63,4.41]	<0.0001
Manly vs. Kings Cross *(7 vs 4)*	3.15	[1.76,4.54]	<0.0001
Manly vs. Darlinghurst *(7 vs 3)*	3.95	[2.56,5.34]	<0.0001
Bondi vs. Coogee *(8 vs 9)*	2.25	[0.86,3.64]	<0.0001
Coogee vs. Kings Cross *(8 vs 4)*	2.37	[0.98,3.76]	<0.0001
Coogee vs. Darlinghurst *(8 vs 3)*	3.18	[1.79,4.57]	<0.0001

In order to determine whether mean ratio differed across each defined area, a one-way analysis of variance (ANOVA) was employed (Shapiro Wilk $p > 0.05$). There was a statistically significant difference in the ratio between the defined areas ($p < 0.0001$) at the 0.05 level. In order to identify specific between LGA differences, a Tukey's post hoc procedure was utilised.

The mean ratio for the number of incidents that occurred in alcohol related times over the number of incidents that occurred in non alcohol related times was statistically significantly different in Darlinghurst (2.14) compared to Manly (6.09) and Coogee (5.31) from January 2001-September 2007 at the 0.05 level. Specifically, the count ratio of incidents that occurred in alcohol related times over incidents that occurred in non alcohol related times in Manly and Coogee were statistically significantly higher than in Darlinghurst ($p < 0.0001$). The ratio was found to be statistically significantly higher in Coogee (5.31), compared to that in Bondi (3.06) and Kings Cross (2.94) ($p < 0.0001$).

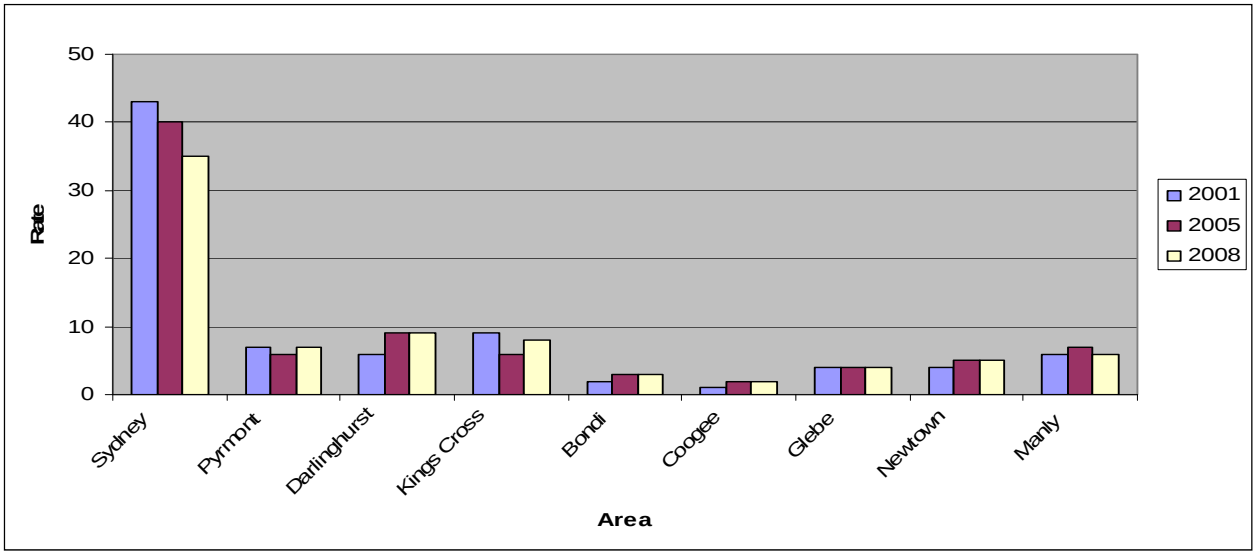
In addition, the number of incidents that took place in alcohol related times over the number of incidents that occurred in non-alcohol related times was statistically significantly greater in Manly (6.09), compared to that in Bondi (3.06) and Kings Cross (2.94) across the past seven years ($p < 0.0001$). The model accounted for 59.1% of the variability in mean ratio, based on crimes included in the surrogate measure for alcohol related times and non alcohol related times. Again, the variability does not include the number of venues in each LGA nor operating hours (see Appendix B).

Pair-wise comparisons between Manly vs. Coogee, Bondi vs. Kings Cross and Bondi vs. Darlinghurst were found not to be statistically significant.

3.4.3 Rates of licensed premises per 1,000 population within and across study sites

Figure 4 shows the rates of licensed premises per 1,000 population.

Figure 4: Rate of licensed premises per 1,000 population



Sydney city clearly has the highest rate of licensed premises per population. The drop from about 45 to 35 licensed premises per 1,000 population is primarily due to its 27% increase in population (see Table 1), rather than the 5% increase in the number of licensed premises (see Table 2).

Conversely, the slight upward trends for Darlinghurst, Bondi, Coogee and Newtown generally reflect upward trends in their number of licensed premises (37%, 20%, 22% and 27% respectively), given their relatively modest changes in population size (9%, 1%, 0% and 11% respectively).

The rest are relatively stable. Cross checking numbers of licensed premises (Table 2) with population estimates (Table 1) shows the reasons for this stability vary. Pyrmont, for example, has had a substantial increase in the number of licensed premises (33%), but this has been counter-balanced by its population growth (37%). Manly has had a slight increase in licensed premises (9%), but no population growth. Kings Cross has shown a reduction in licensed premises (5%), balanced by relatively modest population growth (10%). Finally, Glebe has been stable on both indices (-4% and +4%).

3.4.4 Rates of crime and licensed premises over time, per 1,000 population

Figure 5 shows the rates of crime and licensed premises over time per 1,000 population.

Figure 5: Relationship between % change in rate of licenses per 1,000 population and crime rate, 2001-2006

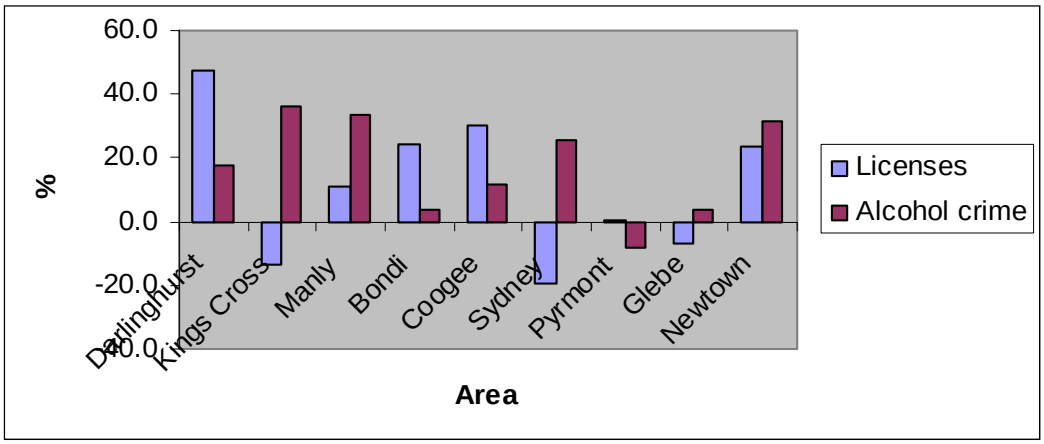
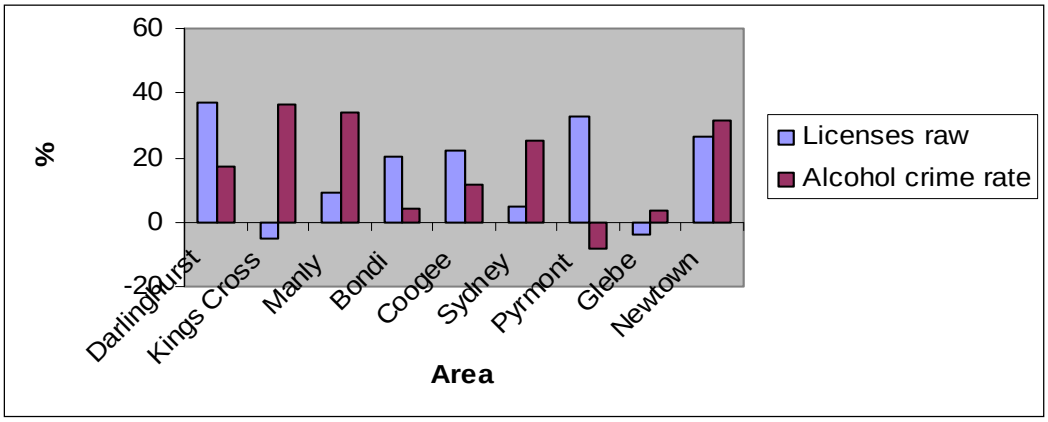


Figure 6 shows the relationship between % change in raw licenses and rate crime, 2001-2006

Figure 6: Relationship between % change in raw licenses and crime rate, 2001-2006



A number of observations can be made in relation to Figures 5 and 6:

- Crime has increased from 2001 to 2006 in all defined areas, except Pyrmont. This is also reflected in Figure 2. Pyrmont, Manly and Coogee are the only LGAs to experience any

decline in their proportions of alcohol related crime in the 2001-2006 period (Figures 2 and 3) although of these three, rates of crime in both Manly and Coogee are still higher in 2006 than they were in 2001, despite the reductions in alcohol-related crime in 2006 and 2007.

- Given Pyrmont is the clear exception in the data, it is worth considering why it is the only LGA to have fewer alcohol-related crimes in 2006 than in 2001, despite the large increase in the raw number of licensed premises over the same period (Figure 6). This apparent anomaly is explained by Figure 5: although the raw number of licenses in Pyrmont has increased by 33% (Table 2), this was balanced by the substantial increase in the population of Pyrmont (37%) over the same time period (Table 1). Given this, the most reasonable explanation for the overall decline in Pyrmont from 2001 to 2006 is that it has historically been at a very high rate, so was much more likely to decrease than increase, even though the decrease has been modest. This is a statistical effect, which also most likely applies to the reductions in crime in Manly and Coogee, called regression to the mean. In plain language, it is an effect that recognises that the extreme rate of alcohol-related crime in Pyrmont was much more likely to trend back towards the mean scores of the other LGAs, than continue separately from them.
- Alcohol-related crime in Kings Cross has increased by about 40% from 2001 to 2006, the highest increase in any defined area. It is closely followed by Manly and to a lesser extent Newtown. Darlinghurst recorded an increase in alcohol-related crime of about 20%.
- Generally speaking, Figure 6 shows that the number of licenses increases, so does the rate of alcohol-related crime, although the two are not exactly correlated: sometimes a small increase in alcohol outlets is associated with a large increase in crime (eg. Manly); and sometimes a large increase in alcohol outlets is associated with a small increase in crime (eg. Bondi). Kings Cross, Pyrmont and Glebe are the exceptions. The dramatic increase in alcohol harm in Kings Cross is associated with a fall in alcohol outlets, as is the small increase in harm in Glebe. This lack of a direct linear relationship between alcohol-related crime rates and alcohol outlets over time (both the raw number of outlets and their rate per 1,000 population) suggests that the effect of the actual number of alcohol outlets is strong, but is mediated by other variables, including the proportion of venues that are late night trading, the proportion of all alcohol outlets that are hotels/pubs or nightclubs and the density of alcohol outlets.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

Potential limitations in the data

Using crimes in the measure of alcohol-related crime beyond those used nationally by Matthews *et al.* (2002), may reduce the degree of reliability in the data: in some LGAs police may be encouraged to record all crimes while in others, there may be less emphasis on recording some particular types of crime. The surrogate measure allows for this by only including the most serious crimes, so adding additional crimes may reduce the reliability in reporting between LGAs and, therefore, reducing the accuracy of the comparisons between LGAs. Despite this potential limitation, it is important to capture a range of alcohol-related crimes, which in turn improves the statistical strength of the comparisons across LGAs, because larger data sets are less vulnerable to random errors in the data. Including the additional crimes has been shown by Breen *et al.* (2008) to represent a scientifically acceptable balance between increasing the number of alcohol-related crimes and reducing the reliability of the comparisons.

Of the other specific types of crime that might have been included in the surrogate measure, it might be argued that the most crucial of these is disorderly conduct, since it is both likely to be prevalent in the LGAs selected, and is likely to be of nuisance value to the residents of the selected LGAs. However, these crimes were excluded in the interests of focussing on the most commonly occurring, and systematically reported, alcohol-related crimes.

The data regarding the number of licensed premises and their trading hours was provided by the Council of the City of Sydney. There is, however, some uncertainty as to how accurate these data are, particularly in terms of trading hours and even their exact location (it is sometimes difficult to identify the exactl LGA into which an alcohol outlet ought to be most accurately categorised).

It might be argued that the data would show a different outcome if the rates of licensed premises were calculated on the basis of visitors to an area, rather than the population of residents. The logic is that it is the number of people in a given area that contribute to alcohol-related harm, not just the residential population. The number of visitors, however, is not crucial to this analysis for

a t least two reasons. Firstly, the ratio method takes account of overall different levels of population and crime in different areas (more visitors and a greater population would both likely increase crime rates overall, as well as alcohol-related crime) so the effect of the number of people in any given area is already controlled for by the ratio method(as are other potentially confounding issues, incidentally, such as different rates of illicit drug use in different areas). Secondly, although the data could be re-analysed using visitor numbers, this would reduce the rate of licensed premises, calculated using population estimates, for Kings Cross (n=8), Darlinghurst (n=9), since they have large numbers of visitors. However, other areas which already have much lower rates of licensed premises (eg. Bondi = 3 and Coogee = 2) have higher (Coogee) or comparable (Bondi) rates of alcohol-related crime. Consequently, re-calculating licensed premises rates based on visitor numbers is highly unlikely to change the conclusions.

Kings Cross compared to Darlinghurst

A key finding from these analyses is that there has been, on average, statistically significantly more alcohol-related harm in Kings Cross than Darlinghurst, between 2001 and 2007. Both Kings Cross and Darlinghurst, however, have experienced a trend of increasing alcohol-related crime over time: Kings Cross increased approximately 40% from 2001-2007, while Darlinghurst increased approximately 20%.

Data in Appendix B provides the most likely explanation for the greater rates of alcohol-related harm in Kings Cross is the substantially greater percentage of licensed venues that are late night trading in Kings Cross (86%), compared to Darlinghurst (60%). That Kings Cross appears to have a much smaller overall number of licensed premises (137 vs 229), suggests that the likely greater density of alcohol outlets in Kings Cross and the greater proportion of late night trading venues is related to its greater rates of alcohol-related crime.

Kings Cross and Darlinghurst compared to other City of Sydney LGAs

In interpreting these findings, the City of Sydney area (postcode 2000) is not considered because the areas of which it is comprised are too diverse to be meaningfully interpreted. It is likely, for example, that alcohol-related crime around The Rocks and Haymarket is very different to Millers Point and Dawes Point, even though all four areas have the 2000 postcode.

For the remaining postcode areas within the City of Sydney LGA, a greater rate of alcohol-related harm has occurred in Pyrmont, between 2001 and 2007, relative to both Kings Cross and Darlinghurst. Furthermore, Kings Cross (but not Darlinghurst) has a higher rate of alcohol-related crime than Glebe, while both Kings Cross and Darlinghurst have comparable rates of alcohol-related crime compared to Newtown. Glebe has the lowest rate of alcohol-related crime.

The most likely explanation for the high rate of alcohol-related crime in Pyrmont since 2001 is the increase in the raw number of licensed premises over the same period, second only to Darlinghurst (Figure 6), coupled with a dramatic increase in population in the same time period. The dual effect of greater population and more licensed premises has most likely resulted in relatively high rates of alcohol-related crime.

At the other end of the scale, the comparatively low rate of alcohol-related crime in Glebe clearly reflects its very low rate of late night trading premises (17%), compared to Kings Cross (86%), Darlinghurst (60%) and Pyrmont (50%) (Appendix B). Newtown has experienced the third largest increase in its number of licensed premises over time (Figure 6) which, coupled with a high proportion of late night trading venues (59%; Appendix B), is reflected in its alcohol-related crime rates being comparable to Kings Cross and Darlinghurst. These findings indicate that it is both a high overall number of licensed premises and a high percentage of late night trading venues that are associated with increased rates of alcohol-related harm.

Given the results of the Kings Cross versus Darlinghurst comparison, it may be the case that the percentage of late night trading venues is more associated with rates of alcohol-related harm than the overall number of alcohol outlets, although both are clearly important.

The concentration of late night trading venues in Kings Cross, in particular, may reflect the apparent view of the Land and Environment Court that longer trading hours are appropriate in areas with a significant presence of late trading entertainment venues (eg Kings Cross) (see page 24). While there may be substantive pragmatic, or other, arguments for the appropriateness of grouping together late night trading venues (eg. easier policing, less disturbance to the majority of residents, and so on), it is clear from the data that this is also a crucial factor in increasing rates of alcohol-related harm, the burden of which becomes the responsibility of police, ambulance, hospitals, Local Government services and criminal courts.

Kings Cross and Darlinghurst compared to LGAs in the greater Sydney area

Figure 3 shows Manly and Coogee have higher rates of alcohol related harm than Kings Cross and Darlinghurst, while the rate of alcohol-related harm in Bondi is comparable to Kings Cross and Darlinghurst.

One interpretation of this result is that higher rates of alcohol-related harm are not necessarily directly linked to higher proportions of late night trading venues, since the percentage of late night trading venues in Manly and Coogee (44% and 50% respectively) are lower than for Kings Cross and Darlinghurst (86% and 60%). This finding illustrates a critical point: there is not one factor that will result in different rates of alcohol-related crime in different defined areas, but rather a combination of factors, the importance of which will vary from location to location.

For example, while Coogee has a relatively small number of hotels (n=32; Appendix B), at least 50% of them are late night trading venues and there are a small number of Coogee hotels that are consistently identified as being highly associated with alcohol-related harm, especially assaults. This reflects the research evidence from metropolitan centres in NSW that a small number of hotels are associated with the majority of alcohol-related harm (Briscoe and Donnelly, 2003).

Manly, alternatively, has a relatively high rate of licensed premises per 1,000 population (n=6, compared to 8 for Kings Cross, 9 for Darlinghurst and 2 for Coogee; Appendix B) but an average percentage of late night trading venues (44%; Appendix B). The main issue with Manly appears to have been the enormous increase in alcohol-related harm in 2005 (Figure 3): despite the subsequent decline in rates of alcohol crime in 2006 and 2007, this spike has disproportionately increased the average rate of crime for manly across the 2001 to 2007 period.

Finally, there is no evidence that increasing the mix of alcohol license types, without reducing the net availability of alcohol, is likely to be effective: although Pyrmont has the highest rates of alcohol crime and the lowest proportion of restaurants (34%), Coogee and Manly have higher rates of alcohol related harm than Kings Cross and Darlinghurst, despite comparable proportions of restaurants: Coogee 47%; Manly 67%; Kings Cross 48%; Darlinghurst 63% (Appendix B). Glebe, conversely, has a much lower rate of alcohol-related crime than Kings Cross, despite a comparable proportion of restaurants (49%).

4.2 Recommendations

This report is a combination of original data analyses and reviews of existing City of Sydney LGA reports, international case studies and the relevant scientific literature. Based on the information presented, a number of key recommendations can be made:

1. It would be extraordinarily useful for future analyses and data interpretation to improve records relating to descriptions of alcohol-related venues that currently operate within the jurisdiction of the Council of the City of Sydney. This could possibly incorporated into the approvals process. Specifically, more accurate data would be useful with regard to trading hours and numbers of venues. A review of the exact location of all venues would also be useful (to ensure their postcodes match with their actual physical location). As is, the data are adequate for analysis, but their quality could be improved.

2. Assuming the Council of the City of Sydney accept that findings of this report, there would be great value in meeting with representatives from the Land and Environment Court to explain the data, especially that increasing the number of licensed premises is associated with an increase in alcohol-related crime, as is an increase in the percentage of late night trading venues. This would help add significant nuance to the Court's apparent view that longer trading hours are appropriate in areas with a significant presence of late trading entertainment venues, such as Kings Cross. Specifically that late night trading venues are also a crucial factor in increasing rates of alcohol-related harm, the burden of which becomes the responsibility of police, ambulance, hospitals, Local Government services and criminal courts.

3. Since this report is based on a methodology that is of cutting-edge scientific rigour, rates of alcohol-related crime ought to be monitored over time. Alternative sources of data, such as alcohol-related hospital Emergency Department presentations and alcohol-related road traffic accidents, could also be developed and used to more comprehensively monitor alcohol-related harm over time.

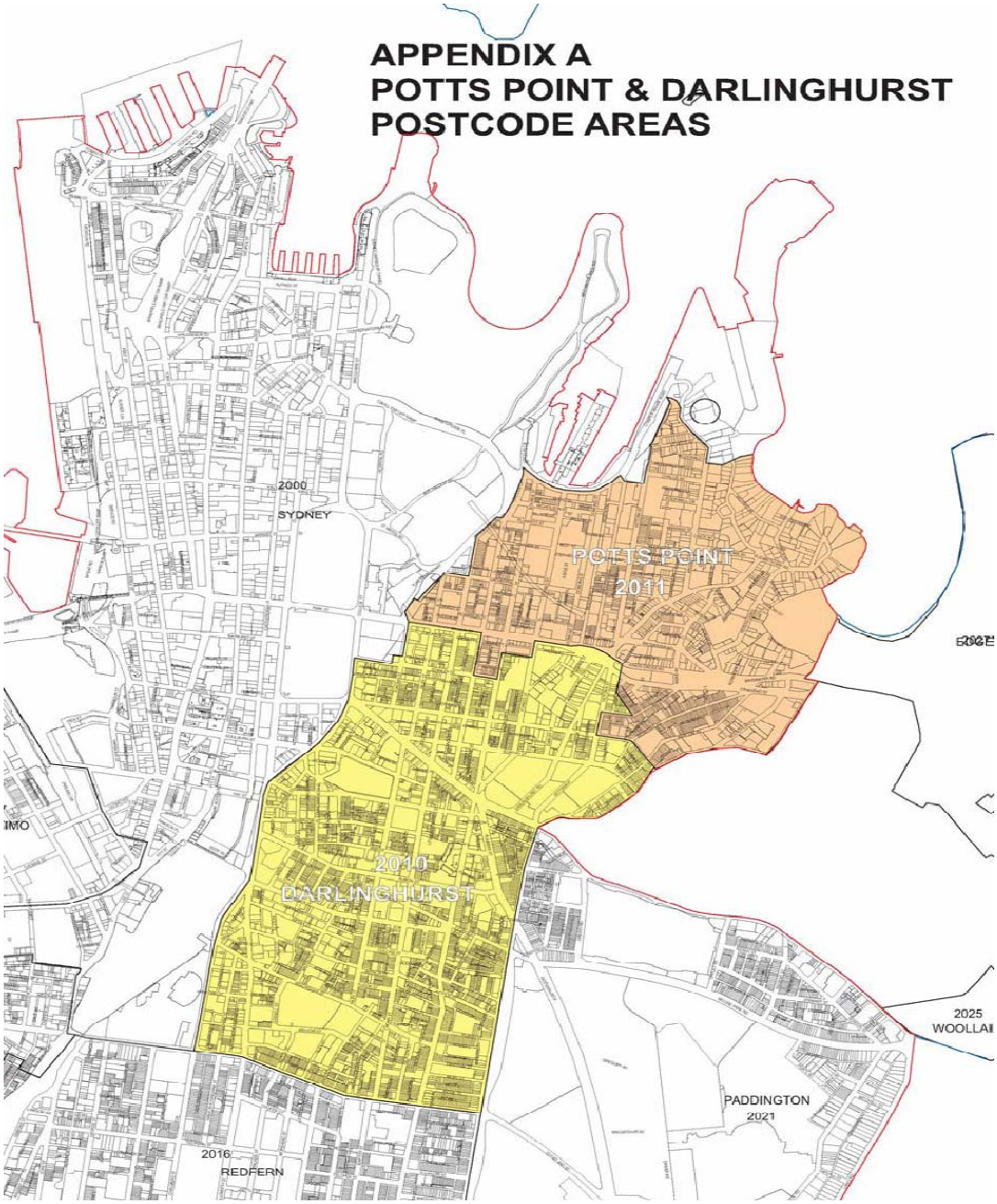
4. There is a clear opportunity for the Council of the City of Sydney to experiment with different intervention strategies, using the outcome measures used in this analysis, to examine the cost-benefit of those interventions to the community. The literature search

5. This report demonstrates, on the basis of the original data analysis and reviews, that increasing the number of alcohol outlets, increasing the number of late night alcohol outlets and/or increasing the density of alcohol outlets – all of which increase the net availability of alcohol in a defined area – will increase rates of alcohol-related crime. The extent of increase will depend on how those factors inter-relate in each different area, but the pattern of increased harms associated with increased net availability of alcohol, is robust across all jurisdictions (except Pyrmont), including Kings Cross and Darlinghurst. It appears that if the proportion of late night venues in Darlinghurst was to increase to a comparable rate as Kings Cross, alcohol-related crime would increase to approximate the currently significantly higher rates in Kings Cross.

6. These results need to be read in conjunction with the results of the recent community survey conducted by the Council of the City of Sydney in Kings Cross to establish whether a saturation point has been reached (since a saturation point is a matter of community opinion, rather than an empirical scientific question). It is apparent, however, that the cumulative effect of an increase in the net availability of alcohol (including an increase in alcohol outlets or an increase in the proportion of late night trading alcohol outlets) will continue the trend of increasing alcohol-related crime in both Kings Cross and Darlinghurst.

APPENDICES

Appendix A: Geographical boundaries of Kings Cross / Potts Point and Darlinghurst



Appendix B: 2008 characteristics of included post-code areas

Characteristic	Postcode area								
	Kings Cross	***Darlinghurst***	***Sydney city***	***Pyrmont***	***Bondi***	***Coogee***	***Glebe***	***Newtown***	***Manly***
Population	17,736	24,631	21,400	11,312	29,920	18,532	13,468	16,299	13,949
# dwellings	12,259	14,351	10,574	5,967	15,753	9,300	6,890	8,232	7,732
# licensed premises	137	229	744	76	89	32	49	83	89
Rate licensed premises / 1,000 population	8	9	35	7	3	2	4	5	6
Mix of licenses (%)									
Hotels	17 (12)	32 (14)	163 (22)	6 (8)	5 (6)	3 (9)	12 (24)	17 (20)	7 (8)
Clubs	1 (1)	4 (2)	27 (4)	0 (0)	5 (6)	5 (16)	1 (2)	1 (1)	7 (8)
Nightclubs	14 (10)	12 (5)	9 (1)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	4 (4)
Hotel, club, nightclub	*32 (23)*	*48 (21)*	*199 (27)*	*6 (8)*	*10 (12)*	*8 (25)*	*13 (26)*	*19 (22)*	*18 (20)*
Restaurant	66 (48)	145 (63)	356 (48)	26 (34)	58 (65)	15 (47)	24 (49)	50 (60)	60 (67)
Other	39 (26)	36 (16)	189 (25)	44 (58)	21 (24)	9 (28)	12 (24)	14 (17)	11 (12)
Hotel, club, nightclub[a]									
24 hour licenses (%)	10 (34)	10 (23)	20 (11)	1 (17)	0 (0)	0 (0)	0 (0)	1 (6)	0 (0)
Late night licenses (%)	15 (52)	16 (37)	95 (53)	2 (33)	5 (50)	4 (50)	2 (17)	9 (53)	7 (44)
24 hr & late night	*25 (86)*	*26 (60)*	*115 (64)*	*3 (50)*	*5 (50)*	*4 (50)*	*2 (17)*	*10 (59)*	*7 (44)*
Up to 12.30am	4 (14)	17 (40)	65 (36)	3 (50)	5 (50)	4 (50)	10 (83)	7 (41)	9 (56)

[a]*Missing data: Sydney city=19; Darlinghurst=5; Kings Cross=3; Manly=2; Newtown=2; Glebe=1.*

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