Pubs and Clubs Project

Literature review of different policy and community-based interventions and baseline trends of specific interventions in Geelong, Victoria (2000–2010)

VicHealth

Pubs and Clubs Project

Final report

Literature review of different policy and community-based interventions and baseline trends of specific interventions in Geelong Victoria (2000-2010)

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Executive Summary

This report reviews the evidence surrounding alcohol, alcohol-related harm, interpersonal violence and the effectiveness of interventions currently employed to deal with these harms. It is well known that alcohol causes massive harm in terms of public health related to illness such as liver disease and breast cancer, however this report focuses on the more acute forms of harm associated with alcohol in terms of intoxication, accidents and violence. Specifically, the report consists of two elements: 1) a review of the literature on the effectiveness of different policy and community-based interventions, and 2) an analysis of secondary data trends in Geelong Victoria over the past 10 years, mapping the effects of specific interventions on indicators such as emergency department attendances, police arrests and ambulance attendances.

Literature review

The literature reviewed demonstrated that there are a substantial number of interventions which can be employed to reduce alcohol-related interpersonal violence. At a national level, the evidence indicates that the most effective interventions include:

- increasing the price of alcohol (through volumetric tax and minimum price)
- stricter advertising codes, overseen by an independent advertising governance body

These interventions can be supported by educational campaigns, but the evidence is clear that stand-alone educational/awareness campaigns fail to improve behaviour across the population. The lessons from smoking and drink driving clearly indicate that a combination of legislative and educational interventions has been effective.

At a state and local level, the evidence indicates that the most effective interventions include:

- the NSW initiative *Alcohol Linking Program* – targeted policing based on *mandatorily* collected last drinks data
- restricted trading hours
- decreased outlet density.

Some benefit has been documented from community intervention projects such as the 'Stockholm Prevents Alcohol and Drug Problems' (STAD) project, but findings have not been replicated elsewhere and effect sizes have been small, depending on the regulatory baseline in which they are undertaken.

STAD provides an example of a carefully designed intervention followed by a highly motivated and capable implementation ultimately resulting in significant reductions in both violence and irresponsible service of alcohol. This type of community intervention is an actionable model which local communities with substantial problems may use to some effect. These best practice elements include:

- ensuring a long term focus on interventions and results
- having a coordinated approach, with dedicated resources and personnel
- including monitoring and, where appropriate, enforcement of measures such as responsible serving
- blanket written responsible service of alcohol serving policies, preferably mandatory, including staff training
- a model for community/scientist/government involvement, and
- an evaluative framework devised at the outset.

The literature suggests that there are many effective interventions which can be implemented at national and local levels. Many of these require strong will on the part of key stakeholders in the face of substantial vested interest and cultural ignorance. Long-term perspectives are needed. Interventions which are currently being implemented require comprehensive and independent evaluation to avoid further repetition of ineffective interventions. It should also be noted that where the ultimate aim of decision makers is to minimise or reduce the negative impact of alcohol on the

public health, safety and amenity of a population, best practice is that which at very least, avoids implementing changes likely to increase overall availability above the current status quo. Finally, coordinated approaches across all levels of government, with specific responsible agencies and post-holders will provide a vital base from which to respond.

Secondary data

At the most basic level of harm, there were 3,934 triage presentations at the Geelong Hospital involving alcohol between 2005 and 2009; and 5,064 assault incidents recorded by Victoria Police during the financial year period of 2004/05 to 2008/09. In addition, 9,422 cases of drink-driving were recorded between 1999 and 2009. In the shorter period of 1 April 2008 and 30 June 2010, there were 1,655 ambulance attendances involving alcohol.

Design and Methods

This report on the stage one findings of the *Dealing with Alcohol-related problems in the Night-time Economy* project (DANTE) examines all alcohol-related injury and harm frequencies over the period 1 January 1999 to 1 February 2010 where data is available. Data was collected from the Barwon Health Geelong Hospital Emergency Department using both keyword searches of triage notes and relevant ICD classifications. Offence data was obtained from Victoria Police for assaults, property damage and drink-driving offences. Ambulance Victoria supplied 1) Computer Aided Dispatch (CAD) records and 2) Victorian Ambulance Clinical Information System (VACIS) patient care records (PCRs) from mid-2008. Records from the two data sources were merged and relevant cases were identified through the use of a set of keywords identified in collaboration between the research team and representatives of Ambulance Victoria.

Secondary Data Trends

Table 1 (next page) presents an overview of the secondary data trends for Geelong over the period 1 January 1999 to 1 February 2010. It is clear that the majority of people experiencing this harm come from the 15–24 age group and that males are generally overrepresented.

Table 1 Summary of alcohol-related trends in Geelong

Indicator	Source	Trend		Peak age group	% Male	Other trends
		Overall	Recent (2009-)			
Alcohol-related injury	Emergency Department	Increasing	Increasing	15-24 (30.1%)	68.9%	Substantial increase since mid-2007. Latest data shows increase continuing at the same rate through February 2010.
Alcohol-related Assaults	Emergency Department	Increasing	Increasing	15-24 (56.7%)	77.8%	
Assaults during high alcohol hours	Victoria Police	Increasing	Stabilising	NA	NA	Some reduction in assault rates during high alcohol hours since October 2008.
Drink-driving	Victoria Police	Stable (fluctuating)	Decreasing (fluctuating)	18-27 (41.3%)	80.7%	Data demonstrates that TAC interventions combined with police operations impact drink-driving rates. There has also been a reduction in the proportion of intoxicated drivers detected at preliminary breath testing stations.
Alcohol-related traffic accidents	Emergency Department	Stable (fluctuating)	Increasing	15-24 (30.1%)	68.9%	An apparent increase may reflect seasonal trends in small numbers.
Ambulance attendances	Ambulance Victoria	Increasing (fluctuating)	Stable (fluctuating)	15-24 (25.3%)	40.41%	The overrepresentation of females in the sample may explain differing trends to other indicators
Liquor licenses in Geelong	Responsible Alcohol Victoria	Increasing	Stable	NA	NA	The number of licences active in the Geelong region over the past five years has remained relatively stable.

Demographics

Gender

Overall, men were far more likely to experience alcohol-related harm than women, except for those being attended by ambulances. Males attending the Emergency Department (ED) were more than twice as likely to be involved in alcohol-related triage cases than were females, with 68.9 per cent (n = 2710) of triage presentations being male, and only 31.1 per cent (n = 1224) being female. Similarly, males were far more frequently involved in 'driving under the influence' (DUI) cases than were females, with 80.7 per cent (n = 7601) of all cases being male. In contrast, females were more likely to be involved in alcohol-related ambulance attendances than were males (58.8 per cent; n = 973, female and 40.41 per cent; n = 669) male). It is unclear why this discrepancy exists; however it is clear that in general, males experience far greater harm in relation to alcohol consumption than their female counterparts.

Age

Young adults overwhelmingly experience the greatest acute alcohol-related harm. The age range of ED attendees spanned from 10 to 95, with a mean age of 37 , and a mode age of 20; 15−24 year olds were the largest group and comprised 30.1 per cent
(n = 1185) of all cases. This was more than one third as much as the next largest age-group, 25-34 year-olds, which accounted for 18.9 per cent (n = 742) of the sample. Similarly, 25.3 per cent (n = 418) of all ambulance attendances were in the 15−24 age-group, followed by 25−34 year-olds, who accounted for 17.6 per cent (n = 291) of the sample. The age range spanned from 2 to 96 years old, with a mean age of 33, and a mode age of 20. The 18−27 year-old age group were also responsible for 41.3 per cent (n = 3894) of drink-driving offences. Like other data sets, the age range spanned from 12 to 98 with a mean age of 33, and a mode age of 20.

Time dispersion of alcohol-related harm

Time of day

The vast majority of alcohol-related harm occurs in the early hours of Saturday and Sunday morning. Most (58.5 per cent; n = 2302) of alcohol-related presentations at the ED department took place on the weekends and Sunday had the highest rate of incidents (24.5 per cent; n = 965), most of which (55 per cent; n = 529) occurred between the hours of 12:00 am and 6:00 am. Similarly, most (42.3 per cent; n = 705) of alcohol-related ambulance attendances took place on the weekends and high alcohol hours accounted for around a third (30.5 per cent) of all alcohol-related attendances. The highest frequency of assaults reported by Victoria Police occurred during the hours of midnight and 1:00 am, with assault rates remaining relatively high until 4:00 am. Sunday was the day of the week that had the most assaults recorded.
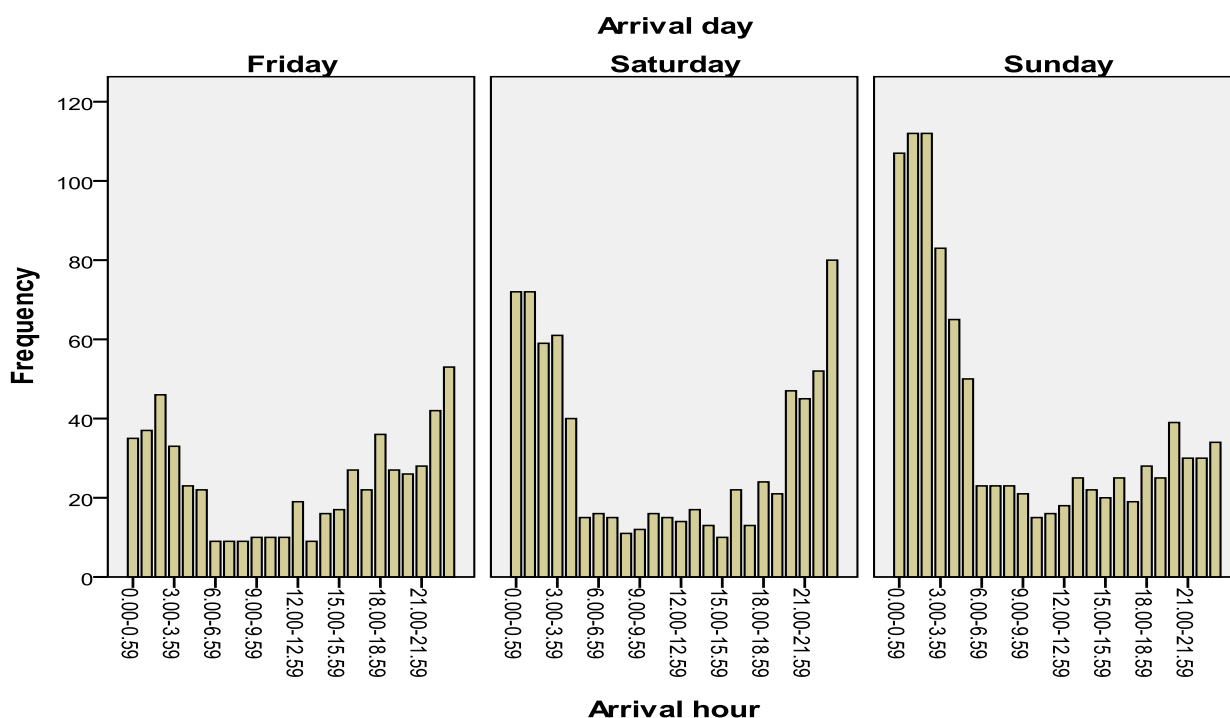
Figure 1 Frequency of alcohol-related injuries by hour and weekend day.

Month of year

There are also clear seasonal trends for alcohol-related harm in Geelong. All of the relevant indicators show an annual peak in January, followed by a drop in February. Events such as New Year's Eve celebrations, and annual holidays in the Geelong area contribute to this annual trend. Further, there is a clear trend of reduced numbers of alcohol-related injuries in the colder months (May-October).

Geographical dispersion of alcohol-related harm

An enlightening aspect of the data is that alcohol-related harm is spread across the Geelong and Surf Coast. While the CBD accounted for most of the incidents of assault[1] in the Geelong–Surf Coast region (n=1309; 25.8 per cent), it was closely followed by areas such as Corio (n=1209; 23.9 per cent) and Whittington (n=560). Incidents of assault most commonly occurred in private residence (n=1839, 36.3) followed by street (n=1428, 28.2 per cent), retail premises (n=293; 5.8 per cent) and then licensed premises (n=271; 5.4 per cent). Similarly, central Geelong accounted for most ambulance attendances (15 per cent), followed by Corio, Norlane and Belmont. The geographical dispersion of alcohol-related harm suggests that interventions targeting the reduction of such harm need to focus more broadly than just the city centre.

Trends over time

Long-term trends over time indicate a steady increase in alcohol-related harm in Geelong, although a number of indicators suggest recent downturns. The main indicator of alcohol-related harm in the community is ultimately people attending hospital. While other indicators such as police assault data which suggest causes for people arriving at hospital, or ambulance attendance data which indicate the manner in which they arrived, the number of people attending the ED must be seen as the ultimate indicator of trends over time.

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[1] 'Assaults' reported by Victoria Police in this report refers to 'incidents of assault'.

Emergency department triage cases

ED attendance data show a steady increase in alcohol-related presentations in the past 10 years available data (see Figure 2). None of the interventions implemented in Geelong coincide significantly with any sustained decrease in alcohol-related injury rates. It was also noted that the *Just Think*[2] intervention was associated with a significant increase in assaults and alcohol-related injury, although causal attribution cannot be made from the available data. Importantly, the findings presented here tend to reflect statewide trends, although data available for this project is more recent than those available at a state level. The most recent data available, up to February 2010, shows continued increases although comprehensive analysis is yet to be completed.
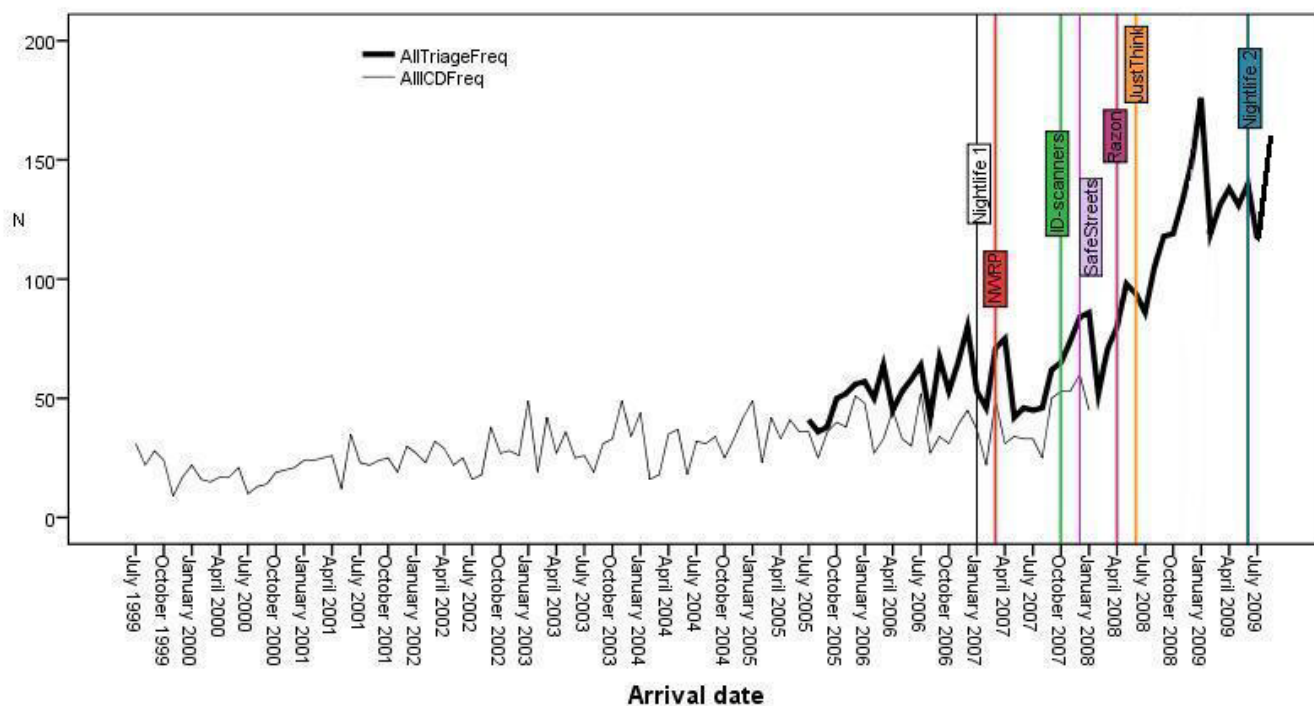
Figure 2 Alcohol-related cases by month and year.

Police assault records

The frequency of assaults during high alcohol hours, taken from Geelong police data also shows an increasing trend over time, although assaults during high alcohol-related times seem to have shown a levelling off. This may reflect increased police numbers and innovative policing techniques being used within the Geelong CBD, although none of the interventions appear to be directly related. In addition, policing tactics regarding anti-social behaviour changed in 2009, with the introduction of substantive fines for anti-social behaviour which may mean that the number of assaults reported will drop while the number of fines given out will increase.

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[2] Just Think was a social marketing campaign aiming to raise public awareness in the Geelong region towards alcohol-related violence.
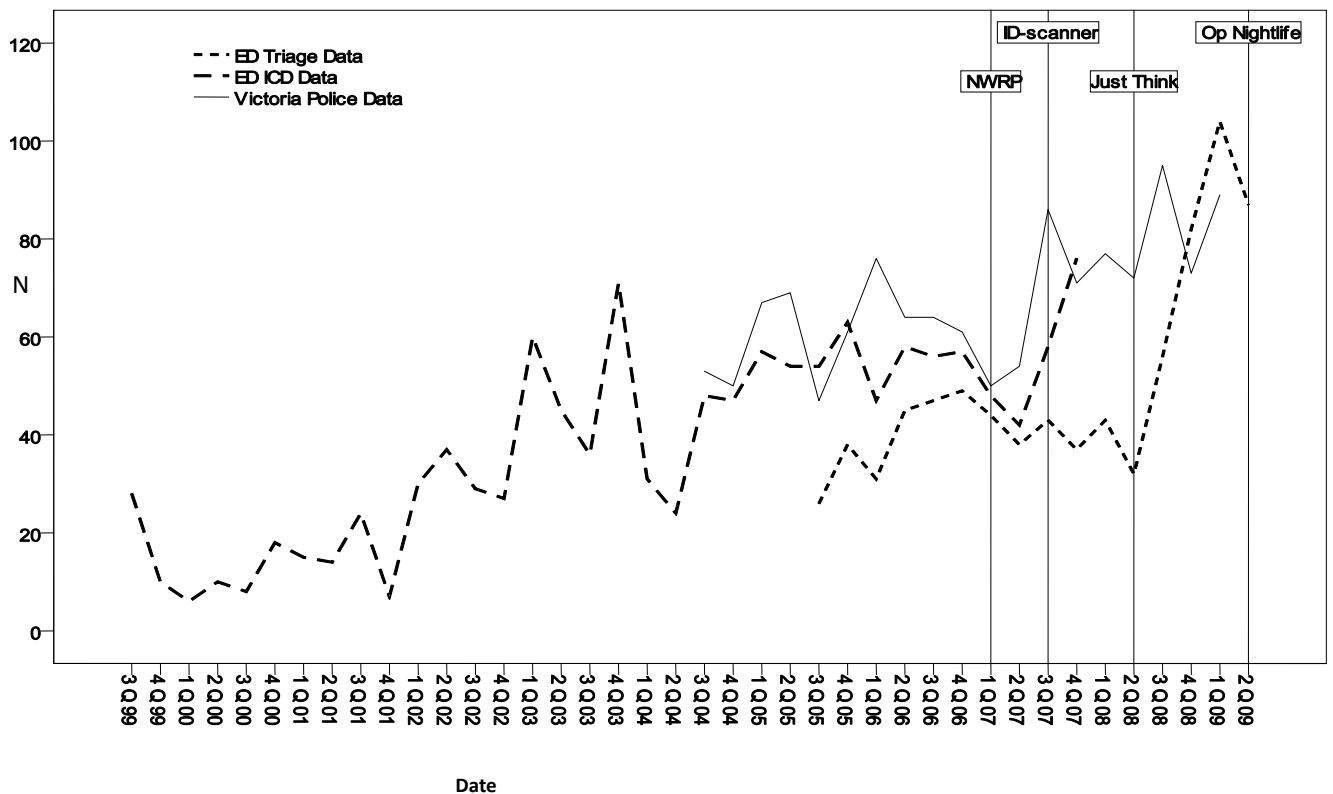
Figure 3 Alcohol-related assault Emergency Department attendances and police assault incidents during high alcohol hours by quarter and year

Police property damage records

Overall, high alcohol hours do not appear to be strongly related to property damage in Geelong, and while property damage offences increased up until mid-2007, they have levelled off since then. Although some offences occur within central Geelong, it is clear that the majority come from suburbs such as Corio, Norlane/North Shore and Whittington – all of which score high on socioeconomic disadvantage. It is therefore logical to assume that interventions focussed on licensed venues and alcohol would have little effect on property damage rates in Geelong—an assumption which is supported in the analyses.

Drink-driving offences

DUI-rates in Geelong over the past decade appear to have decreased incrementally since January 2002 despite the many seasonal peaks and troughs. Similarly, the proportion of people returning positive alcohol tests in comparison to those who are subjected to preliminary breath tests, while showing an overall increase, has shown a consistent decrease since January 2007. While data from the Geelong Hospital emergency department appears to suggest an upward trend, the numbers are too small to be confident that trends are real. There does not appear to be any relationship between any of the community level interventions and reductions in drink-driving. However, significant reductions were noted in association interventions four of the Traffic Accident Commission (TAC) interventions. These findings support the continued efforts of such interventions, particularly when they are run concurrently with increased policing.
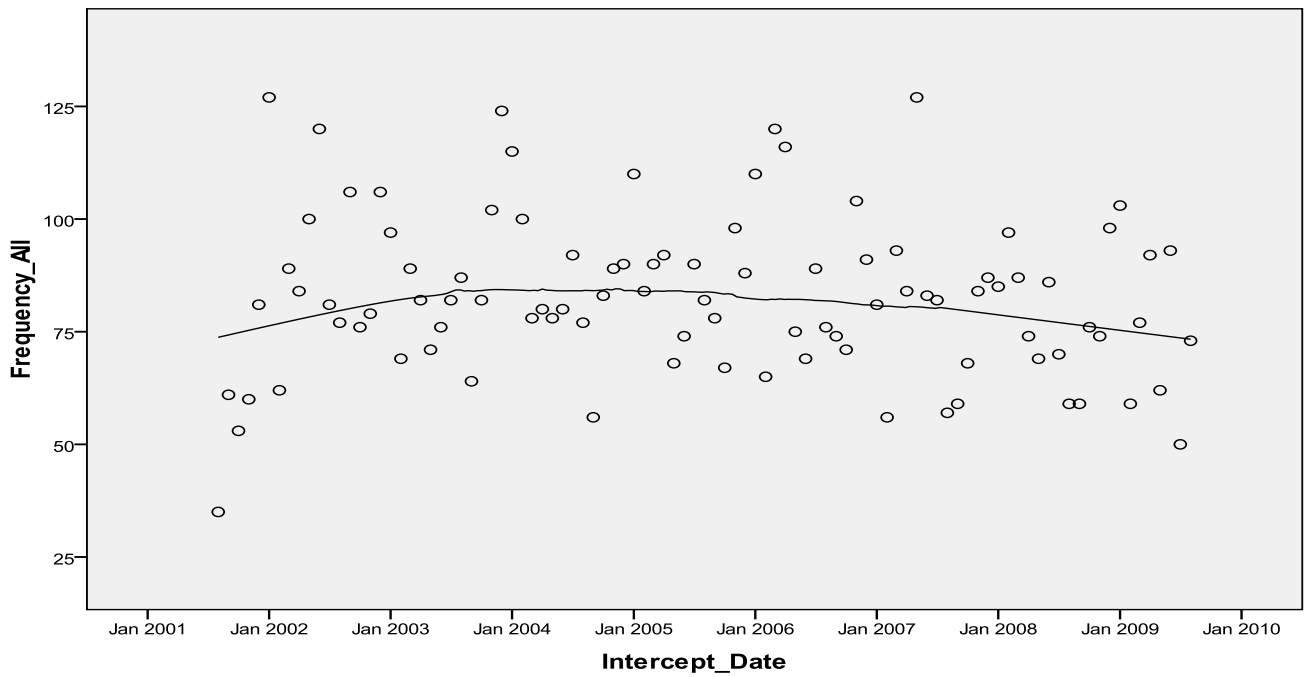
Figure 4 DUI-frequency by month with trend line

Ambulance attendance records

Overall, ambulance attendance records show an increasing trend over the past 3 years, although recent patterns suggest a decline in attendances during high alcohol hours. This data corresponds with police data, but stands in contrast to ED data. The differences between ambulance and ED data may be related to the different gender mix of patients, and it is possible that because ambulances are called for lower level incidents, which appeared to involve more females, that there has been changes in relation to this type of alcohol-related harm.
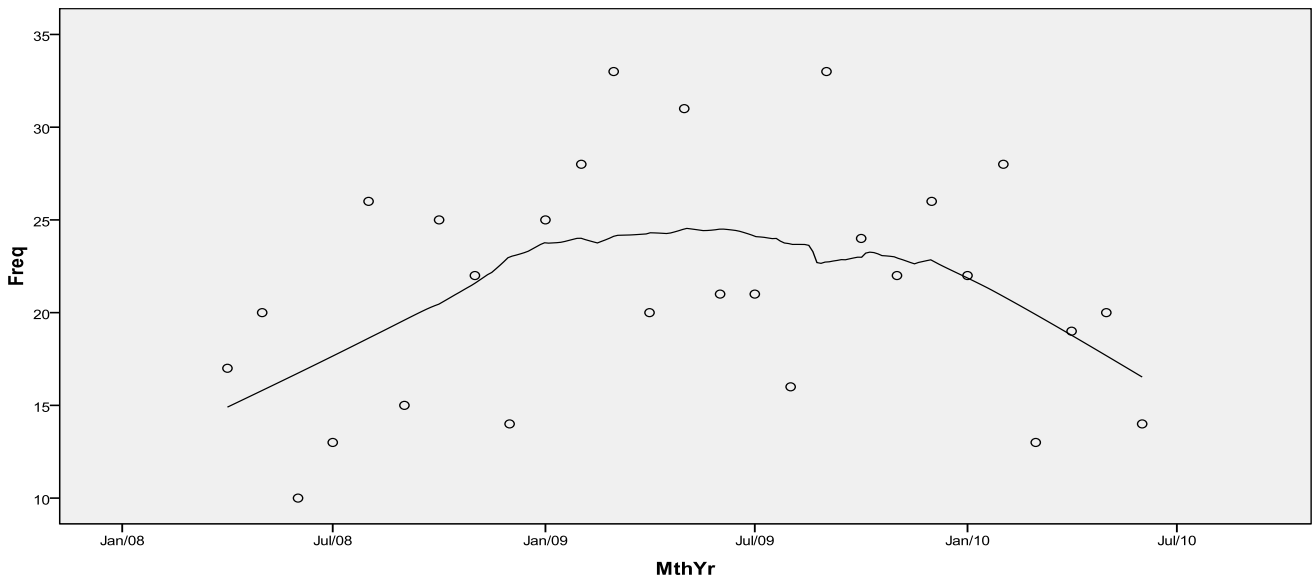
Figure 5 Monthly frequency of Alcohol-Related Ambulance Attendances during High Alcohol Hours over time.

Alcohol availability

While the number of licenses available in the Geelong region increased steadily over the past 20 years, the last five years has seen a levelling off of the number of licences overall.

Data gaps and limitations

Establishing the actual prevalence of alcohol-related harm is difficult and data needs to be interpreted with caution. Almost all data presented and discussed in this report is secondary data, or data that is collected by or on behalf of governments for administrative purposes. In general, the major problems associated with such data sets relate to definitional problems and a well demonstrated under reporting of the prevalence of alcohol-related incidents. Definitional problems include poor definition of an alcohol-related incident, little information about the drinking context, and little information about interactions between victims/perpetrators.

All of the datasets used in this study are known to underreport the prevalence of alcohol-related incidents. Therefore, the data reported in this study does require critical reflection about what may be missing as well as what might be over reported. Despite this, many of the inherent flaws are likely to remain relatively constant. As such, using secondary data to demonstrate trends over time, while not perfect, does give a good understanding of alcohol-related harm in the community.

Conclusion

Alcohol-related interpersonal violence is a complex problem that requires a multi-faceted and long-term primary prevention approach. Many interventions to reduce alcohol consumption and harm have a strong evidence base. The data presented in this report highlight the clear social and health imperatives to reduce overall alcohol consumption and better manage environments where alcohol is consumed.

The literature reviewed demonstrated that there is a range of interventions which can be implemented at national, state, and local levels. At a national level, the most effective policy response to alcohol-related harm include increases in price through taxation on alcoholic beverages and/or a standard minimum price. Raising and enforcing the minimum level purchase age of alcohol has also been found effective in reducing overall harm, including alcohol-related violence. Interventions that reduce the exposure to alcohol marketing are also strongly indicated, as are interventions that reduce licensed outlet density and licensed business opening hours.

The available secondary data on alcohol related harm in Geelong over the past 10 years has demonstrated that there is a substantial cost in terms of social and health-related issues. A minimum of 10,000 people have been seriously affected in the past 10 years and this figure is likely to be a massive underrepresentation. It is also clear that the majority of people experiencing this harm come from the 15-24 age group and that males are generally over-represented. It is also clear that not all harm occurs within the central business district and that it is likely that increased activity around entertainment districts can push alcohol-related harm into the suburbs.

Alcohol-related harm in the Geelong region has increased over time, although a number of indicators suggest this trend may be levelling off or even decreasing. However, Emergency Department data, acting as 'the bottom line' continues to show substantial increases into February 2010. It is also clear that none of the interventions implemented at the community level appear to have any significant effect on their own. However, it is possible that some of the reductions noted in police assault data and ambulance attendance data might be occurring as a result of combined community and police interventions. Certainly, a positive finding is that drink-driving overall in Geelong is clearly declining, which is associated, at least partially, with the implementation of combined awareness and policing strategies. This combination may hold promise for future interventions around alcohol consumption in general across the community.

There is clear need for a wide range of interventions to address the many different types of harm as well as dealing with the many contexts in which alcohol-related harm occurs, whether they be street violence, chronic health disorders or domestic abuse. There are many innovative and effective strategies which can be used to reduce alcohol-related harm. Unfortunately, the most effective of those strategies need to occur at a population level and are likely

to be unpopular with governments and voters. On the other hand, local interventions in their current form seldom show strong effects, although there remains a dearth of methodologically satisfactory research to track the effect of such interventions over time. Understanding how such strategies might work together should be a top priority for government and research institutions and the development of effective community-based models, such as *Safer Bars* and the *Alcohol Linking Program* should be of the highest priority.

Gaps in the evidence

There remain far too many substantial gaps in the evidence base describing the antecedents of alcohol-related harm, and similarly there is a lack of research looking into interventions to reduce such harm. The most glaring gaps in Victorian evidence are in relation to alcohol consumption, access to police data, and details in relation to where problem drinking is occurring (such as *Alcohol Linking Program* data).

In order to improve our understanding of effective prevention of alcohol-related public violence, access to reliable data on alcohol consumption is required. Consumption data is critical for assessing changes to alcohol policies at the local, state and national levels. For example, the tax applied to ready to drink (RTD) beverages in 2008 in Australia was fiercely contested politically and publicly for almost twelve months before some reliable evidence as to its effects on consumption was available. Even so this evidence was limited to sales from take-away liquor outlets and reflected trends in only a portion of the market. Detailed, timely and reliable sales data could have been used to produce timely estimates of the impacts of this tax on overall consumption, as well as any substitution effects between products or between on- and off-premise consumption.

There are major gaps in the evidence regarding many of the practicalities associated with licensed venues and night-time entertainment districts, such issues of correct staffing and security levels, the placement and use of CCTV and other forms of surveillance and venue design, although the Victorian government's recent guidelines on this has provided a much needed baseline. A major area which requires further investigation is around the provision of adequate and appropriate transport infrastructure, particularly in relation to taxis. These issues should form the basis of a program of further research.

Another substantial gap in the evidence is research into the role of the media, their editorial policies and the moral panics they create. There also remains a lack of evidence around how factors such as alcohol marketing, price and access affect violence. Finally, the evidence presented above demonstrates the value of collating secondary data for local areas. The collection and public reporting of such information for other areas would provide valuable feedback for communities struggling to determine what works in their local context. Because evaluations are not conclusive, policies should be implemented using a problem-solving approach in which many tactics are tested, evaluated, and refined. This approach requires sustained, integrated efforts.

Recommendations

On the basis of the data derived from Geelong and the available research literature, it is recommended that:

1. A model of community alcohol responses be developed

It is clear that the ad-hoc introduction of interventions focussing on licensed venues has not reduced alcohol-related cases attending the Geelong Hospital Emergency Department. In light of this, and the evidence from previous research, it is recommended that a community alcohol intervention model be developed which is ideally introduced at a governmental level, incorporating major stakeholder organisations such as Police, local councils, licensing bodies and other government and non-government organisations. The focus of the model should be to address whole-of-community alcohol consumption and the model needs to apportion appropriate responsibility at all venues that sell alcohol. In particular, the off-license sale of alcohol should be addressed and venues such as bottle shops and supermarkets should pay levies which reflect the harm they cause in the community.

This model should act as a model of best practice for communities, proposing structures for funding, staffing, interventions and time frames. Importantly, it should document the effects communities can expect to see from different interventions over time, as well as explaining any possible benefits from adding interventions. A vital

element is the benchmarking and ongoing monitoring of major trends in each community, with guaranteed timely feedback to all community stakeholders.

The evidence available recommends a long-term, whole of community approach akin to the Preventing Alcohol Trauma Community Trial in the USA. This consisted of five mutually reinforcing components:

1) Community Mobilisation Component to develop community organisation and support,

2) Responsible Beverage Service Component

3) Drinking and Driving Component to increase local DWI enforcement efficiency and to increase the actual and perceived risk that drinking drivers would be detected

4) Underage Drinking Component to reduce retail availability of alcohol to minors, and 5) Alcohol Access Component to use local zoning powers and other municipal controls of outlet number and density to reduce the availability of alcohol.

It is recommended that a similar program be developed in collaboration with the Victorian government, with culturally and legally specific elements that include other issues such as transport plans and data sharing protocols. In addition, it is recommended that this program utilise existing Liquor Accord frameworks with changes to the legal status and membership of Accords, as well as development work on Accord being made license type (e.g. late night venues or bottle shops being separate Accords) and whether mandatory membership is feasible.This system will allow flexible, responsive and community-based responses to alcohol-related harm.

2. Improved data collection and access be prioritised

The lack of access to data regarding consumption of alcohol and its related harm in the community in most states remains a substantial, but easily corrected gap in the knowledge base. Two major elements: 1) timely and universal access to relevant data sources across Victoria, and 2) targeted information regarding the sources of alcohol-related harm in the community.

2.1. Timely and universal access to relevant data sources across Victoria

It is currently extremely difficult and expensive to access crime statistics in a timely fashion in Victoria and communities are unable to make informed decisions about how to identify and address the crime issues they face. This is particularly problematic in high visibility issues such as alcohol-related violence. New South Wales currently operates the Bureau of Crime Statistics and Research (BOCSAR) as a statistical and research agency within the Department of Attorney General and Justice. Similarly, South Australia operates its Office of Crime Statistics & Research (OCSAR) within the Attorney General's Department in 1978 and is responsible for research into and the monitoring of crime trends and the criminal justice system within the state. BOCSAR was particularly prominent recently with the release of a report into the effects of restricting trading hours of licensed premises in Newcastle (Jones, et al, 2009), demonstrating the worth of having publicly available and independent analysis of crime statistics inform public policy and interventions. It is recommended that Victoria adopt a similar model for the independent collection and dissemination of crime statistics.

2.2 Collection of systematic targeted information on sources of alcohol-related harm

Similarly, the uniform adoption of mandatorily collected 'last drinks' from police and EDs has been demonstrated in the literature as one of the most effective methods for dealing with alcohol-related harm. The Alcohol Linking Project in NSW demonstrated a very significant reduction in harm associated with licensed venues through the systematic collection of basic information about where an individual arrested for an alcohol-related offence purchased their last drinks (Wiggers, et al, 2004). A system such as this must be mandatory for police to record as voluntary schemes have showed little worth. Further, collecting this data from patients attending the ED in Cardiff, Wales was found to be associated with a reduction of up to 40 per cent of violence-related offence attending the ED (Shepherd, 2007). Both interventions involved subsequent intervention with venues identified with increased harm in the community, and

while unpopular with licensees, are seen as an equitable way of identifying the sources of alcohol-related harm in the community. This is particularly relevant for the recent trend to pre-drinking and identifying where patients are accessing alcohol before attending licensed venues. It is recommended that such a system be trialled in a number of Victorian cities.

3. Explore alternate sustainable models of governing the night-time economy

The evidence has shown repeatedly that many police-based interventions, while successful in the short term, fail due to changing priorities and resource issues. This is not a reflection on current police members, rather an issue of resourcing across the state. In the current context of virtually unrestricted trading hours, maintaining adequate surveillance of night-time entertainment districts using police alone appears ineffective in the long term. It is recommended that alternate governance models, which include the use of alternative custodians, such as Protective Service Officers be explored. Such a model should come from statutory bodies and not be out-sourced to private security companies.

Funding for such a model could be supplied through the application of harm levies, as recently imposed by the City of San Francisco, whereby sellers of alcohol pay additional levies to cover the public cost of their profit-making business. Such a model would ideally include takeaway liquor retailers who are currently free from cost of the alcohol they supply.

4. Models of transportation research and intervention trials

The data presented in the report highlights the amount of alcohol-related violence which is occurring outside licensed venues. Previous (Homel, et al, 2004) and on-going (Miller, et al, under review) research has identified transport out of night time entertainment districts as a major factor in alcohol-related harm. Lack of transport can contribute to drink-driving, the injury of intoxicated pedestrians and increased violence through people being on the streets long after they wish to be there, either at taxi ranks or when people are walking home. Lack of adequate transport is also likely to contribute to property damage rates. Current models fail to adequately meet transport needs, but there is no information on how big the problem is or what interventions are likely to be effective. It is recommended that a program of research be conducted around taxi and public transport systems for night-time entertainment districts, emphasising the need for different solutions in larger cities and regional areas, both in terms of transport costs and cultures relating to public transport.

5. Stricter marketing codes overseen by an independent body

The review highlighted the importance of marketing of alcohol as a major influence on popular culture which has substantial effects on alcohol consumption and co-occurring violence and harm more generally. The evidence is also clear regarding the failure of current voluntary codes and a mandatory code of marketing conduct should be enacted, overseen by an independent body, free of advertising or liquor industry representation.

In light of this, it is recommended that stricter marketing codes for alcohol in all forms of media be introduced, to be overseen by an independent governing body funded through a specific advertising/marketing levy.

6. Specific formulations to reduce alcohol outlet density and trading hours be developed and implemented

The empirical support for an inverse correlation between outlet opening hours, and alcohol-related violence is clear. A comprehensive formula for the best model of trading hours in regards to public safety and health should be developed and implemented. While the evidence to date is clear about effectiveness, the information available has been collected on an ad-hoc basis where policies have been implanted on the basis of need when other policies have generally failed. Rigorous trials of different formulations of trading hour regulations would provide much-needed data about which combination of trading hours restrictions would be most effective at reducing harm, while ensuring liquor retailers are minimally harmed. It is recommended that such policy trials and research be implemented within Victoria.

Similarly, further information is required about the optimum number and type of outlets selling alcohol for different communities and how this can be best addressed through policy mechanisms. It is recommended that a program of research be undertaken in collaboration with government to explore both license limiting legislation, but also license buy-back schemes where there are an excessive number of licenses in communities.

7. A sophisticated model of pricing controls should be implemented

Excise taxation and minimum prices on alcohol products are the most successful alcohol policy in terms of cost-effectiveness, reductions in level of consumption, and overall social benefit. A model which considers a combination of pricing measures should be implemented. This model should include a graduated volumetric tax which increases proportionally with the volume of alcohol per beverage. An additional harm levy should be further explored for local communities to deal with specific problems.

Introduction

Interpersonal violence has consistently been related to alcohol consumption in many societies including Australia. The combination of alcohol and interpersonal violence has a considerable impact on communities around the globe in terms of health, economic and social order. In addition to vast personal costs, alcohol-related violence also has great impacts on families, communities and governments. A substantial proportion of the problems associated with alcohol and interpersonal violence arises in or around licensed premises in the night-time economy and this review looks at the interventions which have been found effective in dealing with alcohol-related harm.

The pervasiveness of alcohol-related violence has been documented in a broad range of studies which have demonstrated links between alcohol consumption and public violence (Finney, 2004; Ingemann-Hansen & Brink, 2004; Warburton, 2006), sex crimes (Abbey, et al., 2001; Abbey, et al.; Horvath & Brown, 2006), and domestic violence (Abunã Salcedo & Carvalho, 2005; Fals-Stewart, 2003; Klostermann & Fals-Stewart, 2006). The relationship between alcohol and interpersonal violence has also been documented across many types of violence in many different countries. For example, the World Health Organization has estimated that: 80 per cent of juvenile violence in Estonia is associated with alcohol; 33 per cent of perpetrators of domestic violence in Switzerland are intoxicated, and; 46 per cent of rapes in Spain are committed by persons under the influence of alcohol (Bellis, 2005 2005).

Similar associations have been noted in Australia (Collins & Lapsley, 2008), where alcohol is related to around 3,000 deaths and 65,000 hospitalisations every year. During an average week, four people under 25 die as a direct result of alcohol-related harm, and 70 Australians under 25 are hospitalised due to injury associated with alcohol consumption (Chikritzhs, et al., 2003). Over half of offences occurring on the street have been associated with licensed premises in Australia (Buss, et al., 1995; Ireland & Thommeny, 1993) and over half of all drivers charged with drink driving offences consumed alcohol on licensed premises prior to the incident (Stockwell, et al., 1992). In approximately 43 per cent of all assaults which occurred in Australia in 2005, the victim was male and between the age of 18 and 24 years old. 34 per cent of these assaults took place at bars, taverns, pubs, and nightclubs (ABS, 2005). Further, in 2004-05, the annual cost to the Australian community of alcohol-related social problems was estimated at $15.3 billion (Collins & Lapsley, 2008).

However, responses to alcohol-related aggression and violence have only a small literature base in comparison to other problems of similar magnitude that face the community. This is due to a variety of factors, including the widespread acceptance of alcohol consumption and related violence as a part of Western culture, as well as the difficulty in trialling many of the interventions in a scientifically rigorous fashion (Graham, 2008). This has resulted in a situation where most communities employ a piecemeal approach combining traditionally popular responses which have proven to have little effect, with new ideas with little theoretical basis (Miller, et al., 2010c). In addition to this are the massive vested interests involved, which include an array of industry bodies, government departments from many levels, concerned citizens, as well as researchers seeking to build careers. In light of this current situation, we will critically review the evidence base on alcohol policies and community intervention strategies, while also identifying areas which have yet to be tested.

Literature review

Alcohol Policy

The most comprehensive review of alcohol policy and the measures most effective for responding to alcohol-related harm is *Alcohol: No Ordinary Commodity* (Babor, et al., 2003). The book reviews the scientific evidence for strategies and interventions designed to prevent or minimise alcohol-related harm: pricing and taxation, regulating the physical availability of alcohol, modifying the drinking context, drinking-driving countermeasures, regulating alcohol promotion, education and persuasion strategies and treatment services. The final section considers the policymaking process on the local, national and international levels, and provides a synthesis of evidence-based strategies and interventions from a policy perspective. Some of these approaches have proven more effective than others.

Alcohol Advertising and Promotion

Alcohol beverages are typically marketed through nearly uninhibited advertisements in the media, films and television shows, as well as through brand merchandise and a variety of sponsored events (Babor & Caetano, 2005; McClure, et al., 2009b). Exposure to such alcohol promotion has been associated with the development of positive and care-free attitudes to drinking in the general public (Ellickson, et al., 2005; Smith & Foxcroft, 2009), as well as increased consumption (Engels, et al., 2009 Hollenstein & Bot, 2009) earlier initiation to alcohol use (McClure, et al., 2009b), increased under aged drinking (Anderson, et al., 2009b; Hastings, et al., 2005 & Gordon, 2005; Snyder, 2006) and alcohol-related violence (Casswell, 1998). In spite of these findings alcohol advertising is self-regulated by the liquor industry in many countries, including Australia. This clear conflict of interest juxtaposed with the empirical evidence of the harmful effects of alcohol promotion, has led to much debate about the detrimental nature of the alcohol industry's advertisement programs, and in particular about their sponsorship of sport clubs, teams, and events. On the basis of recent evidence indicating higher levels of alcohol consumption among athletes connected to industry subsidised sport clubs or teams, Kypri et al. (2009) argued for a ban on this type of funding and advertisement, and instead suggested channelling revenue accrued from increased taxation on alcohol products into community initiatives, such as sport clubs.

Apart from total bans, the harmful effects of alcohol promotion have also been attempted curbed by advertisement restrictions and regulations – most of which have shown significant, but limited effects on consumption with weak to average effect sizes at best (Saffer, 1991; Young, 1993). Saffer and Dave (2002) found that total and sustained prohibition of alcohol-advertising decreased overall alcohol use with up to 8per cent, while Agostinelli and Grube (2002) concluded that counter-advertising and warning labels had the potential to dilute the effect of alcohol-promotion at a statistically significant level (Kypri, et al., 2007). The evidence base for the latter approach, however, is typically qualified by intricate interactions between audience cognitive/affective processes and message factors, such as design, content, and source (Agostinelli & Grube, 2002; Austin, 2000). Overall, the literature on the effects of alcohol counter-advertising and regulated advertising, is based on an exceedingly small evidence base which is plagued by a vast number of confounding factors, and which should look further into the relationship between the different types of promotion and how restrictions on these might affect consumption and attitudes towards alcohol (e.g. Donovan, et al., 2002; Hastings, et al., 2005; Jones & Lynch, 2007). One such example includes consumption and promotional clothing and paraphernalia (McClure, et al., 2009a) as well as the alcohol industry's sponsorship of sport.

Minimum Legal Drinking Age

Alcoholic beverages are easily obtainable in most of Australia. One avenue for reducing alcohol availability in the community, particularly for young people, is to establish or reduce the Minimum Legal Drinking Age (MLDA). In a review and analysis of the effects of changes to the MLDA from 1960 to 2000, Wagenaar and Toomey (2002) examined 241 empirical studies on the subject. Of the analyses deemed to be of a certain high methodological quality (56per cent), 33 investigated the effect of the MLDA on alcohol consumption, 79 looked at the MLDA and traffic crashes, and 23 pertained to miscellaneous social and health problems including violence. 33per cent, 58per cent, and 34per cent respectively, found an inverse relationship between the particular outcome variable and an increase in the

MLDA, while all of the remaining studies reviewed bar one, found no effect. Thus, with the exception of a single piece of research, all of the statistically significant results obtained in the comprehensive range of literature reviewed supported a negative correlation between the MLDA and the particular outcome variables. Although, many of the results examined demonstrated small statistical effect sizes, the practical outcome of, for example, increasing the MLDA to 21 years, involved preventing an estimated 846 deaths on US highways in 1997 (Wagenaar & Toomey, 2002). While most of the studies reviewed by Wagenaar and Toomey were American, the negative correlation between MLDA and alcohol consumption and related harm, has also been found in other countries, such as New Zealand (Kypri, et al., 2006) and Denmark (Møller, 2002). However, it should be noted that strict enforcement of a given legal drinking age is required to obtain and preserve the desired result (Forster, et al., 1995; Grube, 1997). For maximum effect, age limits must be enforced by police and bar staff. Although, some groups such as college students have been shown to be resistant to age restrictions (Martinez, et al., 2009), such adverse consequences are typically greatly outweighed by the benefits identified elsewhere (Wagenaar & Toomey, 2002).

Alcohol Outlet Opening Hours

Another way that the availability of alcohol can be limited is through the reduction of licensed venue trading hours. A consistent and robust relationship between alcohol-related violence and outlet opening hours has received strong empirical support (Chikritzhs & Stockwell, 2002, 2006, 2007; Chikritzhs, et al., 2005; Duailibi, et al., 2007). Perhaps most prominently, a Brazilian longitudinal study of the effects of a ban on alcohol trade between 11pm and 6am, found a large statistically significant reduction in homicides of nearly 9 per month, or 30 per 100,000 population (Duailibi, et al., 2007). Similarly, Chikritzhs and Stockwell found that a one-hour extension of trading hours in the Perth night-time economy was related to a mean 70per cent rise in assaults in and around licensed venues (Chikritzhs & Stockwell, 2002). This effect was mainly attributed to an increase in alcohol consumption and patron numbers which in turn was credited to longer trading hours of night-time businesses.

While most other studies provide further evidence to the negative effects of extended opening hours, and the positive outcomes of trading hour restrictions (Plant & Plant, 2005; Ragnarsdottir, et al., 2003) a few exceptions do exist. In the most recent and comprehensive review of the relationship between trading hours and consumption and related harm, Stockwell and Chikritzhs (Stockwell & Chikritzhs, 2009) identified 49 studies which met the standard of their inclusion criteria. Of these 25 concluded in favour of the positive outcomes related to early closing times or the negative effects of extended trading hours. Only 14 of the 49 papers were peer-reviewed and included baseline and control measures, however, and the vast majority of these (79per cent) produced at least one statistically significant result supporting the positive correlation between opening hours and consumption and related adverse effects. Based on the strength of the evidence examined, the review concluded that an increase in trading hours in the night time economy will, in most instances, result in increased alcohol consumption as well as in related negative effects such as assault and accident.

Thus, while the evidence in this area varies in quality as it does in conclusion, the majority of the research supports the effectiveness of restricting opening hours to prevent alcohol-related violence, particularly so within the Australian context.

Alcohol Outlet Density

The third major way to reduce alcohol availability in the community and its associated harms, is by reducing the density of licensed premises where alcohol can be purchased. Previous research has demonstrated positive correlations between alcohol outlet density and aggravated assault (Livingston, 2008a), domestic violence (McKinney, et al., 2009 2009), rape and homicide (Britt, et al., 2005). Britt et al. (2005) report that an addition of one alcohol establishment to a neighbourhood which has the average observed density of alcohol outlets, would result in an increase in the number of violent crimes in that neighbourhood by 5 per 1000 capita per year. Nonetheless, in spite of the apparent robustness and clarity of these relationships, several qualifications should be taken into account including the socioeconomic status (SES) of a given community, as well as the particular prevalence of different types of alcohol outlets. For example, while Gruenewald et al (2006) found a positive general relationship between alcohol outlet density and violence rates, this association was demonstrated to be conditional on other factors such as high

population density, low SES, and type of alcohol business. The quantity of off-premise alcohol stores, for instance, was significantly and positively correlated with assault rates, whereas bars were not.

Further, in a similar study of outlet quantity and violence rates across 581 area codes in California, positive correlations were established between violence and density of bars and off-premise alcohol retail shops, while a negative such association was found in relation to restaurants (Gruenewald & Remer, 2006). This association between type of outlet and rates of violence, was uncovered in greater detail in Livingston (Livingston) who established a consistent positive correlation between the density of off-licenses and violence in suburban areas, and on-premise licenses and violence in inner-city and inner-suburban areas. Other research again, adds further nuances to the relationship between violence and alcohol outlet density, as it has also been found that alcohol-fuelled domestic violence sometimes occurs at a higher rate in an area with fewer alcohol outlets, than in a district with more such businesses (Block, 1995). In the latter case, it was discovered that certain licensed premises were hot-spots for violence – a conclusion which lends support to the idea that factors (clientele, establishment type and community characteristics) other than outlet density alone also have a potentially significant effect on violence related to alcohol outlets (Block, 1995), although this study is comparatively old and methodologically lacking.

Thus, it would appear that the type of alcohol outlet and various community features, including resident density and SES, interact to either facilitate or moderate the correlation between alcohol outlet density and violence. This reveals a certain complexity to the association between these factors, and emphasises the fact that special attention should be given to specific environmental details when interpreting results related to this particular topic.

Alcohol Excise and Taxation

With a broad and international body of supporting research, excise taxation appears to be the most successful alcohol policy in terms of cost-effectiveness, reductions in level of consumption, and overall social benefit (Babor, et al., 2003). A negative correlation between alcohol price and general use (Babor et al., 2003), violence (Cook & Moore, 1993; Matthews, Shepherd & Sivarajasingham, 2006), injury (Gray, Chikritzhs & Stockwell, 1999), and traffic accidents (Adrian, Ferguson & Her, 2001) has been firmly established by numerous studies, and ostensibly applies across gender and age, SES and geographical location.

For example, in a British study on how the real price of beer influences violence-sustained injuries across economic regions, it was found that a one percent increase in the price of alcohol would result in an economy wide reduction in alcohol-related assault cases of 5000 per year (Matthews, et al., 2006). Such a decrease in injury would have a significant impact on not only the most at-risk segment of the population, but also on the disbursement of health resources. The central message emanating from this study – i.e. that alcohol price and violence are inversely related – has further support in previous studies which found similar relationships between price of beer and youth violence (Cook & Moore, 1993), and cask wine levies and general harm in the population (Gray, et al., 1999).

One of the most recent and perhaps most conclusive examinations of the relationship between alcohol taxation and consumption, is the meta-analysis conducted by Wagenaar, Salois, and Komro (2009) in which they assessed the relative effects of various alcohol taxes on consumption. They found 112 relevant studies from which they derived 1003 estimates of the effect of alcohol levies on alcohol use. After adjusting for various study characteristics, such as methodology, statistical models employed, level of analysis, and multiple outcome measures, the meta-analysis produced a highly significant negative relationship between alcohol price and use ($p < .001$; $r = -.44$). It was further established in this study, that the tax-approach to reduce alcohol consumption generally yielded considerably larger effect sizes than any other prevention policies or programs.

Apart from the clear and significant public health advantages noted above, other benefits of increasing excise and tax include its ease of introduction (equating to a simply changing legislation) and the added benefit of revenue raising – profits which can either be channelled for general purposes, or, more attractively, put towards prevention, treatment and community causes (such as sporting clubs). A few minor limitations associated with increased taxation include potential small rises in alcohol smuggling and home-production when alcohol levies are introduced on a loosely controlled market (Babor, et al., 2003).

Another promising way of reducing consumption through price of alcohol is by increasing the minimum cost. In a UK review of the effects of alcohol cost, Meier (2008) found a continually decreasing drop in consumption accompanying increasing levels of minimum pricing by 5p increments spanning from 20p to 70p. For instance, a 50p, 60p, and 70p increase in price per unit would decrease overall consumption by 6.9per cent, 12.8per cent, and 18.6per cent, respectively. As such, higher price consistently equated to disproportionately lower consumption. Further, according to the review, this strategy was most successful when applied across the board to all alcohol products rather than targeted at certain types. Thus, similar to studies on excise taxation, these findings again attest to the firmly established negative correlation between price of alcohol and alcohol consumption.

Thus, with a wide array of empirical support, and very few limitations of any type, excise taxation and minimum pricing of alcohol can certainly be regarded as a highly (if not the most) efficient, cost-effective, and encompassing approach to reducing overall alcohol consumption and in effect alcohol-related harm and social costs.

Alcohol Policy Summary

It is clear that there are qualitative differences between the evidence underpinning the respective alcohol policy responses to reduce alcohol-related harm. The research supporting alcohol-promotion restrictions and anti-alcohol campaigns, for example, is variable. Although it is relatively clear that there is a link between anti/pro-alcohol campaigns and consumption, further research in this area is needed. Similarly, although many studies on alcohol outlet density appear to support an inverse correlation between outlet density and alcohol-related harm, this relationship is complex. In contrast, there is ample empirical support for raising the MLDA and restricting alcohol outlet opening hours as effective strategies in reducing alcohol consumption and related harm. Further, even more evidence is available for the value and general success of excise taxes on alcoholic beverages. This policy appears to be especially effective as research has typically yielded highly statistically significant results and large effect sizes. Increased taxation is also very cost-effective and relatively easy to implement. Finally, minimum pricing is a very promising approach which is similar in effect to excise taxation.

Community-level Alcohol Intervention Strategies

In contrast to the larger societal alcohol interventions, community level alcohol intervention strategies tend to focus more on the reduction of related harm, than reducing consumption per se. Generally, such programs can be divided into the four different subgroups: Voluntary alcohol programs for individual drinking establishments; community alcohol accords; police interventions, and; community action projects. As with alcohol policies, different community-based approaches have different levels of effectiveness.

Voluntary alcohol programs for individual businesses

The majority of voluntary alcohol programs for licensed premises centre on responsible service of alcohol (RSA) training (see Table 2) - an approach which has shown varying levels of success. Such interventions typically involve education about MLDA and public drunkenness, the physiological effects of alcohol, identifying overt signs of patron intoxication, and general management of problem customers (Graham & Homel, 2008a). While effects have been significant, the size of the effect has generally been small and often short-lived (Johnsson & Berglund, 2003; Wagenaar, Toomey & Erickson, 2005). For example, Lang et al. demonstrated a decrease in patrons rated as 'extremely drunk' ($p<.017$), a decline in BAC-levels ($p<.03$), and a small but statistically significant increase in staff knowledge of RSA laws ($p<.05$). Similarly, Johnson & Berglund (Johnsson & Berglund) reported reductions in average BAC-levels of bar patrons (-.011, 95 per cent CI = .022-.000) as well as in 'rowdy' atmospheres (-6pts, 95 per cent CI = -11 to -1). A third study which focused on alcohol sales to minors (Wagenaar, et al., 2005) generated a post-intervention 17per cent decline in underage alcohol purchases. Thus, RSA programs have demonstrated positive, albeit moderate, effects on variables such as BAC-levels, extreme intoxication, and raucous on-premise behaviour.

Table 2 Community-level Intervention Programs

Study/Program (year)	Location/Sample	Intervention Type	Effect
Buka & Birdthistle, (1999)	USA/Alcohol servers (*N*-106)	RSA training	$F(2, 208) = 9.83$, p < .001 on DSBI*
Chandler et al., (2000)	USA/Alcohol servers (*N*-121)	RSA/ Management of patron problems	Increase in knowledge/ attitude regarding violence prevention (t = 4.97, p.< .001)
Gliksman et al., (1993)	Canada/Alcohol servers (*N*-57)	Server Intervention Program (SIP) (RSA)	Better knowledge and practice of, and attitude towards RSA. Stat. Sig. p<.001-.01.
Graham (2004, 2005)	Canada/Bar staff	Safer Bars	Better RSA/handling patron aggression. Stat. Sig. p<.001.021.
Johnson & Berglund (2003)	Sweden/Bar patrons (*N*-1322)	RSA	Lower BAC/Better social atmosphere in bars. p<.12/stat. sig. CI 95%
Lang et al., (1998)	Two bars in WA/Staff & Patrons	RSA	Lower BAC/Fewer cases of extreme intoxication. p<.03/p<.017
Saltz (1987)	USA/Staff & Patrons	RSA	
Wagenaar et al. (2004)	USA/20 cities in midwest	RSA	Sales to minors decreased 17%. Stat. Sig. p<.05

More extensive than RSA-based interventions, the Canadian *Safer Bars* program (Graham, et al., 2004) focuses not only on education in staff management of patron aggression, but also on assessments of hazardous on-premise environmental factors which potentially precipitate violence. The training component of the program was in large part derived from existing knowledge on interpersonal communication including body language and personal space, as well as police techniques for handling violent persons. Several trials of Safer Bars were conducted to streamline the initiative before it was finally implemented for ongoing evaluation in 2000. Effectiveness of the intervention was measured on several degrees of displayed aggression (moderate/severe aggression with probable intent/definite intent). A moderate decrease in aggressive behaviour was reported at statistically significant levels ranging from p=.001-.021. These results were principally attributed to the training module of the program rather than to any environmental considerations and adjustments (Graham & Homel, 2008a; Graham, et al., 2004).

However, factors such as high staff turnover and variable participant motivation compromise most of these effects which have been characterised by a relatively short lifetime. It has been proposed that ongoing training and evaluation should therefore be a fixed element in these types of interventions (Graham & Homel, 2008a; Wagenaar, et al., 2005). This could be further explored by looking into measures which enshrine comprehensive staff training and certification in law for all people working in a licensed venue, including security and door staff, as well as waiters and bartenders. Finally, other elements of staff and licensee training should also include education in forestalling and dealing appropriately with harassment of, and violence against women (Graham & Homel, 2008a).

Venue Design

One element of the Safer Bars type of program which has received further interest - and often with the involvement of industry - is the design of bars and clubs. This research focuses specifically on the design characteristics of licensed venues which facilitate or impede interpersonal aggression and violence. These factors include availability of public transport, crowdedness of the bar/club, internal lay-out as well as general cleanliness and patron comfort (Graham & Homel, 2008). While such factors have been shown to precipitate interpersonal aggression in the nightlife, the relationships do not appear to be direct or generated from any one variable alone. For example, factors such as crowdedness and an impractical venue lay-out might contribute to incidents of aggression as it is likely to create more instances of accidental bumping/spilling of drinks between patrons (Graham, 2006). Similarly, the cleanliness of a given venue appears to signal an environment of permissiveness and carelessness which in turn probably facilitates anti-social behaviour (Graham & Homel, 2008a; Homel, et al., 2004). As such, the effects are complex and relatively difficult to pin down as they are most likely due to multiple interactions between several or all of the identified predictors (Graham, 1980; Graham & Homel, 2008). Further, it should also be noted that while the above variables may have been found to impact levels of aggression and violence on licensed premises at a statistically significant level, the relevant effect sizes are consistently extremely small. Interventions at this level should therefore be part of greater multilevel initiatives for maximum effect.

Community Alcohol Accords and Venue Accreditation Schemes

Community alcohol accords are voluntary initiatives based on active cooperation between a number of licensees and various government groups, including the police. Participants agree to uphold certain guidelines and rules to maintain a level of order and security in the night-life, and are, in return, accredited with a label of approval indicating an acceptable standard of operation. The Geelong Local Industry Accord, for example, centres on a set of licensee requirements which involve minimum entry charges to venues and elimination of pass-out stamps, removal of drink promotions and a set level of RSA (City of Greater Geelong, 2007). The police role centres on enforcement of these regulations. Similar approaches to the reduction of alcohol-related violence have been attempted in Freemantle (Hawks, Rydon, Stockwell, White, Chikritzhs & Heale, 1999) and Sydney (Graham & Homel, 2008) as well as in the UK with the Pubwatch schemes (Pratten & Greig, 2005). However, evaluations of these approaches have found variable effects. While impact assessments of the Geelong accord suggested decreases in assaults and improvements in RSA, flaws in data collection methods and the lack of a comparison community undermine the reliability of these results (Rumbold, et al., 1998). Comparison data of Geelong and other Victorian metropolitan areas showed that prior to the intervention, Geelong's serious assault rate was 52 per cent higher than the comparison rate for the other areas. After the intervention, Geelong's serious assault rate declined to 63 per cent of the comparison rate for the other areas (Rumbold et al., 1998). However, the lack of a control site and reliance on police data undermines the validity of the study. Further, whilst the Accord has continued to operate since the early 1990s, ED attendances for hospitalisations have continued to increase (Miller, et al., 2010b). More rigorous trials in Fremantle and Sydney reported no statistically significant effects whatsoever (Graham & Homel, 2008a), and similarly evaluations of Pubwatch have been largely inconclusive or non-existing.

A slightly different tactic has been attempted with the British 'Best Bar None' (BBN) accreditation strategy. This scheme centres on the promotion of good practice among licensees rather than on punitive enforcement of regulation, and is thus presented as an inclusive community initiative designed to encourage improved conditions in the night-time economy (Graham & Homel, 2008; Ackerman & Rogers, 2007). The rationale upon which BBN is built, however, is largely arbitrary, and as the project does not accommodate for any form of evaluation other than anecdotal impressions, there is very little, if any, empirical evidence supporting the value or influence of this scheme (Graham & Homel, 2008a; Pratten, 2005).

The apparent lack of effect of community alcohol accords and accreditation schemes has been attributed in part to the reliance on entirely voluntary participation, a typical shift in focus from curbing violence to licensee compliance issues, and finally a common failure to adequately deal with non-compliant venues (Graham & Homel, 2008a).

Significantly, such schemes often rely on the allocation of police resources which may not be realised on a consistent basis in an environment of scarce resources. Thus, despite some promising fundamental elements, such as community cooperation and mobilisation, there is a lack of evidence supporting the effectiveness of community accords and accreditation schemes in reducing alcohol-related harm.

Table 3 Community Alcohol Accords

Project Title	Location	Intervention Type	Effect
Best Bar None	UK	Licensee accreditation scheme	Better communication between licensee and police; proper evaluation needed.
Freemantle Police-Licensee Accord	Freemantle, WA, Australia	Police-licensee cooperation	No effect
Geelong Local Industry Accord	Geelong, VIC, Australia	Police-licensee cooperation	Possible reduction in assault & drink promotion; increase in RSA.
Kings Cross Accord	Sydney, NSW, Australia	Government-police-licensee cooperation	No effect
Pubwatch	UK	Licensee-police cooperation	Possible reduction in violence; proper evaluation needed.
TASC	Cardiff, Wales, UK	Government-police-hospital-licensee cooperation	Possible reduction in violence; overall inconclusive results.

Police interventions

Most police interventions are based on highly visible enforcement of drinking laws on and around licensed premises, and are either targeted at certain problematic establishments or at random in the community. This approach can thus be divided into the two main strategies of 'randomised' and 'targeted' enforcement interventions (Graham & Homel, 2008a).

Randomised enforcement interventions are exemplified by studies such as the Torquay experiment (Jeffs & Saunders, 1983), the Brighton (Stewart & Casswell, 1993) and Sydney (Burns & Coumarelos, 1993) replications, and the Wellington enforcement experiment (Sim, 2005). All of these interventions emphasised random and visible police visits to licensed premises as their central approach. The Brighton and Wellington initiatives also included police cooperation with other community bodies such as the liquor industry, licensing authorities, and public health. Although the Sydney and Wellington replications had no measurable impact, the Torquay and Brighton projects had positive effects on alcohol-related arrests as well as on the relationship between hospitality staff and police. In Brighton, a 14per cent decrease in alcohol-related assault was detected, while in Torquay alcohol-related arrests decreased significantly (p<.005) and notable indications of improving RSA practice were observed. However, while these findings were promising, the effect sizes were generally small and the overall impact decayed rapidly post-intervention (Jeffs & Saunders, 1983; Sim, 2005; Stewart & Casswell, 1993).

Table 4 Police Interventions

Study (Year)	Location	Intervention Type	Effect
Burns & Coumarelos (1993)	Sydney, NSW, Australia	Random police visits to licensed premises	No effect.
Jeffs & Saunders (1983)	Torquay, UK	Random police visits to licensed premises.	Moderate effects on arrests, RSA, police-licensee cooperation.
Stewart (1993)	Brighton, UK	Random police visits to licensed premises; police-licensee-hospital cooperation.	Moderate effects on arrests and police-licensee cooperation.
Sim, Morgan & Batchelor (2005)	Wellington, New Zealand	Random police visits to licensed premises; police-licensee-hospital cooperation.	Moderate effects on arrests, violence, RSA, police-licensee cooperation, police stance.
Wiggers et al. (2004)	NSW, Australia	Tracking location of alcohol-crime & venue improvements	Reductions in alcohol-related incidents including assault.

Compared with randomised policing, targeted police enforcement has yielded better results. Two particularly promising strategies deserve special attention – namely, the Australian 'Alcohol Linking Program' (Wiggers, et al., 2004) and the Welsh 'Tackling Alcohol-related Street Crime Project' (TASC) (Maguire, et al., 2003).

The Alcohol Linking Program was conducted over a nine-year period in NSW, Australia, and was mainly focused on assessment of licensed premises in terms of alcohol-related crime rates associated directly with a given venue. The project identified the last place of drinking of any intoxicated offenders apprehended by the authorities, allowing police to locate potential problem venues. Importantly, significant effort went into ensuring that police filled in the relevant forms. Once a drinking establishment had been linked to a certain number of alcohol-related crime incidents, the licensee was informed of their 'performance' in comparison to other venues. An internal audit of the premises was subsequently conducted by the police to determine whether an appropriate level of RSA was practiced, and finally, the given licensees were invited to a police workshop where proper alcohol service and management could be discussed (Wiggers, et al., 2004). Over a three-month time-span, this course of action was associated with a 36 per cent drop in alcohol-related criminal incidents in the experimental community compared to a decrease of 21per cent in the control area (p<.08). Further, assault-rates declined by 32 per cent in the experimental community compared to a 25 per cent reduction in the control region (Graham & Homel, 2008a; Wiggers, et al., 2004).

The Tackling Alcohol-related Street Crime project (TASC) was a multi-component enterprise which apart from targeted policing of confirmed problematic venues, also involved local council lobbying to influence alcohol policy and an extensive media focus on alcohol-violence, RSA training for hospitality staff and rehabilitation therapy for repeat offenders (Maguire, et al., 2003). The TASC-project also involved the establishment of a Licensee Forum to assist in organised dialogue between licensees as a group and regulatory authorities (Maguire, et al., 2003).

The evaluation of TASC estimated an 8 per cent decrease in the rate of violent incidents, but these results were qualified by several assumptions related to crime rates in other parts of South Wales. Overall most of the results generated during the TASC project were inconclusive and limited by flaws in the research methodology such as the lack of a comparison site as well as a relatively short project time-frame. Further, the reported sceptical reception of the program by the County Council, greatly impeded the hoped for progress and results. However, there were still some elements of the program which seemingly decreased violence. These included a combination of targeted police enforcement, graphic presentations of alcohol-violence injuries to managers of problematic establishments, and a

police warning that an audit of the given venue would be published in six months (Graham & Homel, 2008a; Maguire, et al., 2003).

Considering the small body of literature available, the overall efficacy of police interventions ranges from the generally modest and unsustainable effects obtained in randomised interventions, to the more extensively researched and comprehensive targeted approach. The Alcohol Linking Program is far and away the most promising evidence-based police method of curbing alcohol-related harm in and around licensed premises. It has been adopted on a permanent basis by some other Australian states and territories as well as New Zealand police (Graham & Homel, 2008a). Further, the TASC project also provides extra support for the potential of a targeted police enforcement approach.

Community action projects

Community action projects are comprehensive approaches at tackling alcohol violence on several levels simultaneously. This typically includes community mobilisation in terms of publicity campaigns, local task force activities, and community forums and discussion groups. Further emphasis is usually placed on RSA practice, security staff capabilities, environmental safety factors, and police enforcement of liquor laws (Graham & Homel, 2008a).

Table 5 Community Action Projects

Study (Year)	Location	Project
Hauritz & Homel (1998); Homel et al. (1997; 2006)	Surfers Paradise, NSW	The Queensland Community Safety Action Project
Holder et al. (2002)	California, USA	Community trial
Reilly et al. (1998)	North Coast, NSW	Operation Drinksafe
Staffström & Östergren (2008)	Trelleborg, Sweden	Trelleborg Intervention Strategy
Treno et al. (2007)	California, USA	Sacramento Neighborhood Alcohol Prevention Project (SNAPP)
Wagenaar (1999, 2000)	Midwest, USA	Communities Mobilizing for Change on Alcohol (CMCA)
Wallin et al. (2003; 2005)	Stockholm, Sweden	Stockholm Prevents Alcohol and Drug Problems (STAD)
Weitzmann (2004)	USA	A Matter of Degree program (AMOD)

* Desired Server Behaviour Intervention

The most often cited community action initiative to date, is probably the Swedish 'Stockholm Prevents Alcohol and Drug Problems' (STAD) project. The STAD-project was launched by the Stockholm county council in 1995, and consists of a multi-component approach to reducing alcohol-related violence and intoxication in the night-time economy and the community as a whole. The project centers on RSA-training and, importantly, enforcement of RSA-practice, as well as community mobilisation and engagement with these preventive measures (Wallin, et al., 2005). The RSA-training included servers, security staff and owners, and covered both Swedish alcohol law, physiological and psychological effects of alcohol, and conflict management. At the end of 2000, over 570 servers, doormen, and managers had gone through the training program (Graham & Homel, 2008b). Enforcement of RSA-practice comprised of official warnings to venues demonstrating problematic serving practices. Joint audits of licensed premises were also carried out by the alcohol licensing board and police, fostering communication and cooperation between the two authorities as well as producing more effective venue assessments (Wallin, et al., 2005). Importantly, the project-measures were institutionalised in 2001, with the various project components added to national legislation, and responsibilities of the

project allocated to the stakeholders involved. Results included a 29 per cent reduction in violent crimes occurring between 10pm and 6am, compared to a slight increase in the control area. Further, the refusal of service rates

increased from 5 per cent in 1996 to 70 per cent in 2001. Components of STAD vital to its success include a centralised action group/steering committee, a relatively extensive project time-frame (ten years) allowing development and refining, and the concerted efforts by police and licensing boards to enforce RSA-practice (Wallin, et al., 2003).

However, recently released data from a subsequent six city expansion of STAD program has shown that while uptake was good in all cities and there were very high levels of fidelity in implementation, there were no discernible changes in serving practice or alcohol-related harm (Andreasson, 2011). These findings give substantial cause for reflection on what might have been different about the original STAD trial. The STAD project started from an extremely low baseline where police only ever went to licensed venues when they were called, normally to break up fights which could not be handled by security. Further, there was virtually no concept of responsible service of alcohol, with pseudo-patron studies showing that in the initial round of observations, 95 per cent of bars would serve an actor portraying heavily intoxicated behaviour who had staggered to the bar, had problems sitting down or standing at the bar and fallen asleep briefly before attempting to order the beer. Thus, the improvement to only 47 per cent (Wallin, et al., 2002) of bars still serving these intoxicated individuals still represents a basic failure of RSA (Wallin, et al., 2002). Starting from such a baseline, virtually any intervention would be likely to see an improvement. This means that while the measures outlined in the STAD project may be highly effective in a context of low baseline RSA practice, they are unlikely to have as much of an impact on an environment where RSA, enforcement of alcohol laws, and community pressure decreased alcohol-related problems has been in place for some time.

Another community action approach is exemplified by the Australian 'Queensland Safety Action Projects' (Hauritz & Homel, 1998). Through a multi-pronged community approach involving licensees, police, the liquor licensing authority, and local and state government, the project focused on enforcement of RSA laws, improved crowd controller capabilities, better night-time community transport, and the creation of a general drinking environment less conducive to aggression and violence. The Queensland Safety Action Projects was trialled in four towns and the evaluation reported a decline in verbal abuse (82 per cent), arguments (68 per cent), and assault (82.1 per cent) (Homel, et al., 2004). However, there was almost a complete lack of effect-sustainability post-intervention – some of which might be attributed to a lack of dedicated resources and mediocre police intervention.

These and other community intervention projects (e.g. the Sacramento Neighborhood Alcohol Prevention Project (SNAPP) (Treno, Gruenewald, Lee & Remer, 2007)) and the Preventing Alcohol Trauma: A Community Trial project (Holder, Saltz, Gruber, Voas, Gruenewald & Treno, 1997) have consistently produced positive results and the evidence suggests future efforts should be focused on adapting the best parts of these programs to other communities and countries. These best practice elements include:

- Ensuring a long term focus on interventions and results
- Having a coordinated approach, with dedicated resources and personnel
- Including monitoring and, where appropriate, enforcement of measures such as responsible serving
- Blanket written responsible service of alcohol serving policies, preferably mandatory, including staff training
- A model for community/scientist/government involvement, and
- An evaluative framework devised at the outset.

Community-level alcohol intervention summary

The main components of community-level alcohol intervention are voluntary interventions with licensees, community alcohol accords, police programs, and community action projects. There is substantial variance in the effectiveness of each of these approaches. The majority of effect sizes for single focus or short term are relatively small. Entirely voluntary interventions also appear constrained by the number and type of establishments that participate and often have a time-limited effect. More comprehensive and longer term models (such as the Safer Bars program) demonstrate improved outcomes. Similarly, community alcohol accords and accreditation schemes, as an intervention in their own right, appear to have little or no effect and the evidence is typified by short-term, flawed research designs as well as poor implementation and enforcement.

Random police visits to licensed establishments with the aim of ensuring licensing regulations has produced only disparate, moderate and unsustainable positive impacts on RSA and violent offending during program implementation. On the other hand, targeted police interventions where police identify particular venues associated with alcohol-related violence and focus reactive and preventative efforts on these establishments, have proven more valuable. The most effective example is the Alcohol Linking Program, through which promising declines in alcohol-related crime and assaults were obtained. Community action projects such as the Queensland Safety Action Projects and the Swedish STAD, have reported promising results in communities with low baseline regulation, which were associated with relatively large and sustained declines in aggression and violence. While there are now a number of promising examples of such interventions, more trials are required in different cultural settings.

Discussion

Based on the evidence reviewed for this paper it is clear that there are a range of interventions which can be implemented at national, state, and local levels. At a national level, the most effective policy response to alcohol-related harm include increases in price through taxation on alcoholic beverages and/or a standard minimum price. A consistent drop in consumption following implementation of such interventions has been firmly established, though its direct link to alcohol-related violence is less clear. Raising and enforcing the MLDA has also been found effective in reducing overall harm, as well as alcohol-related violence. The links between alcohol advertising and counter-advertising is more complex and, while suggestive of positive effects, requires more definitive interventions and research. Similarly, although the findings in regards to licensed outlet density and consumption indicate a considerable positive correlation, community characteristics still need to be taken into consideration. In contrast, however, there is robust support for reducing licensed business opening hours.

A clear evidence base exists for targeted police interventions such as the Alcohol Linking Program. The success of this initiative can in large part be attributed to the high level of cooperation between police and academic experts in the focussed bid to develop a practical program based on the available empirical evidence. A promising community-level intervention strategy appears to be community action projects such as STAD. These initiatives greatly reduced alcohol-related aggression and violence in the night-life, and were also highly conducive to positive fundamental change within the community as well as productive cooperation between various community organisations and government agencies. Vital elements of this intervention were the 10-year time frame and the central co-ordination of the project. The most evidence-based intervention to date is the *Safer Bars* intervention which is designed to reduce aggression and violence on licensed premises (Graham, et al., 2004). While the program does highlight the contribution of alcohol intoxication to barroom aggression (Graham, et al., 2006) – and thus the importance of avoiding over-serving of patrons – the measures central to *Safer Bars* focus on training staff in pragmatic and applied methods for dealing with and reacting to patron problem behaviour and aggression (Graham, et al., 2004). Other community-level intervention strategies suggest smaller effects such as RSA-training and RSA-based programs, which, while statistically significant, have relatively small and short-lived effect sizes. These approaches, however, appear to be more powerful than Liquor Accords and accreditation schemes, which have been generally found to have little effect, particularly due to their voluntary nature.

While there have been many efforts to contain and diminish alcohol-related harm, few have been evaluated and even fewer have been found effective. This is indicative of the weak and inconclusive quality of the available evidence. This is due to the complexity of the relevant variable relationships involved and the inherent difficulty of conducting sound scientific investigation with community-level interventions.

Many intervention strategies have been intuitive and impetuous rather than evidence-based and measured, and in many instances appear to serve as public assurance of swift government action rather than as a scientific and evaluated approach to reduce alcohol-related violence. Examples of such projects include current attempts at curbing alcohol-related violence through a random and highly visible police presence in the nightlife - an approach reminiscent of the largely ineffective interventions of the past (Jeffs & Saunders, 1983). In order to avoid such disjointed and uninformed efforts to reduce alcohol-related violence, overarching cooperation should be facilitated between the relevant academic bodies, licensees, various community action groups, and the executive branch of the government

dealing with the problem. A prime example of the benefits of such coordinated and prioritised efforts is again embodied by such initiatives as the Alcohol Linking Program and STAD.

A major obstacle to the implementation of evidence-based intervention policies is the influence of the alcohol industry which usually acts in aid of securing its own (financial) interests, rather than those of the general public. The overwhelming profit motive of the alcohol supply industry and its immense power can act as a constant obstruction for interventions which might affect their revenue. Thus, many of the most effective measures may never be trialled because of the industry influence and government concern for continued economic growth. In light of this, it is worth restating the fact that greater sales, employment, and profit by the alcohol industry generates greater harm for the community, costing an estimated $15 billion annually.

Future directions

The main areas in which to implement interventions are: Price (tax, minimum pricing), advertising, and trading areas (outlet density, trading hours). The most promising results obtained so far, however, are those pertaining to the relationship between alcohol price and consumption and general harm. Further research into excise taxation and minimum pricing would be valuable to further map out the specific connection between alcohol cost and violence, accidents, illness, and other health consequences.

Further research is also needed into community interventions and policing. For example, considering the general inefficiency of voluntary alcohol accords and accreditation schemes, alternative models should be explored where responsible service, and other elements are obligatory and an on-going part of license conditions. Similarly, research into different versions of licensing monitoring and enforcement is also required, as well as additional consideration of models where professional licensing wardens work with the police to enforce licensing regulations. Finding communities willing to trial such measures may prove difficult, but comparison trials are vital to determine the best way forward.

Finally, the cultural and social norms conducive to excessive alcohol intake and violence represent one of the most fundamental parts of the problem. Research into this aspect of alcohol-related violence would conceivably be of great value in informing campaigns and interventions focussed on changing the social acceptance and glorification of alcohol consumption, gendered social norms (particularly in relation to hyper-masculinity) and violence which is rife in many societies including Australia. This type of research should focus on the relationship between consumption, violence, and the common promotional and media portrayal of alcohol alongside elite athletic performance, sexual gratification, and social success.

DANTE Stage 1 baseline findings

Project Objectives

To conduct an audit of the different types of interventions currently employed in Geelong and any supporting literature.

1. To explore models of multi-faceted community-based interventions for alcohol-related problems.

2. To review and improve the measures used to assess effectiveness.

3. To describe and analyse the association between measures of alcohol-related harm and each individual intervention (i.e. ID scanners, curfews, two-way radios and the Liquor Accord).

4. To document the ways in which these different interventions work within the context of a night time economy.

Local context

Geelong

Geelong is a city of approximately 205,000 people with a growth rate of 1.1 per cent per annum. Located 70 kilometres from Melbourne, it is both a regional centre and a suburb of Melbourne, with over 11,000 people commuting to the capital every day. A decline in employment has seen a raft of social problems over the past 3 decades, with alcohol and alcohol-related violence featuring prominently on the social landscape, although much of this has changed in the past decade through community action.

Geelong is unique when it comes to dealing with alcohol-related problems as one of the first cities in Australia to implement an Accord (Felson, et al., 1997; Rumbold, et al., 1998). A study of the Geelong Accord reported the successful application of a strategy where police, licensees and council representatives met regularly to discuss and agree on strategies for dealing with (Rumbold, et al., 1998). While the exact make up of the Accord has changed over time, it continues today and has recently been updated (see www.geelongaustralia.com.au/library/pdf/5293/08.pdf). This accord and the stakeholders involved in its development has created a general sense of co-operation in Geelong over many issues related to alcohol-related problems, although disagreement still exists around such issues as proposals for a city-wide lockdown. Much of the debate around interventions such as this arise because of the lack of detailed documentation of interventions and innovations and the absence of a well-constructed, independent evaluation despite the ongoing presence of alcohol-related problems.

Interventions

In Geelong, as many as 25 initiatives aimed at improving safety in and around licensed venues have been implemented in the past 15 years (Armstrong-Rowe, 2008). None of these interventions have, or has had, a fully developed research component attached to them. Many of the Geelong projects already in progress have come about through engaging participants and developing ownership of the project. Table 6 outlines the interventions put in place, the date they were put in place and the key stakeholders.

Table 6 Intervention by date and key stakeholders

Intervention	Key agency	Date Implemented
Liquor Accord	Victoria Police	in various forms since 1991
Lock-downs (30 mins before closing)	Victoria Police	1991
Safe City CCTV network	Victoria Police, CoGG	2004
Safe Taxi Rank	CoGG	Jan 2005
Dry zones	Victoria Police, CoGG	2006
Operation Nightlife	Victoria Police	Jan 2007
Geelong Night Watch Radio Program	Victoria Police, CoGG, Nightlife Association	April 2007
ID scanners	Victoria Police, CoGG, Nightlife Association	Dec 2007
Safe Streets Taskforce	Victoria Police (Melbourne)	Dec 2007
Operation RAZON	Victoria Police (Melbourne)	April 2008
Just Think campaign	Geelong Advertiser, Geelong Football Club, Drinkwise Australia	June 2008
Operation Nightlife 2	Victoria Police	July 2009
Nightrider bus	CoGG	Nov 2009
Final integration of ID scanners with NWRP and police scanner system	Victoria Police, CoGG, Nightlife Association	Nov 2009
'So you know' campaign (VicPol/CoGG)	Victoria Police, CoGG	Aug 2010

Liquor Accord

As mentioned previously, this has been in place in various forms since 1991 and a new Liquor Accord was adopted in November 2007. The effect of having Licensees, police and local council officers meet regularly has been seldom described (Lang & Rumbold, 1997). Comparison data of Geelong and other Victorian metropolitan areas showed that prior to the intervention, Geelong's serious assault rate was 52 per cent higher than the comparison rate for the other areas. After the intervention, Geelong's serious assault rate declined to 63 per cent of the comparison rate for the other areas (Rumbold, et al., 1998). The Accord consists of a number of agreed principles and actions on the part of all stakeholders. Interventions listed include: A shared banned patron list; agreed levels of security surveillance; Licensed premises which are identified as being 'high risk' implementing I.D. scanners; encouraged use of two-way radios, and; agreement that police be contacted immediately upon the identification of problem patrons.

Safe City CCTV network

The City of Greater Geelong (CoGG) introduced a CCTV network across the Central Activities Area (CAA) in 2004. A range of claims have been made about the success of the CCTV network. For instance, on 31 March, 2008 Cr Harwood indicated the City's network of CCTV cameras had materially assisted police in dealing with a variety of street offences, and also acted as a deterrent to anti-social behaviour around key entertainment areas'. However, to date no evaluation of the impact of the CCTV, or of the interaction between the CCTV network and other interventions has been conducted. Given the significant and ongoing financial cost (including maintenance and expansion) more detailed analysis is needed.

The Geelong night watch radio program

Since April 2007 a program to link up security staff working at the front of late night venues with the City Safe cameras by way of hand held radios has been in place. This allows venues to let each other know when they were having difficulty with particular patrons and enhance safety in Central Geelong. Given the number of late night licensed venues in Central Geelong, there is an excellent opportunity to use the 'eyes and ears' of the security personal employed by venues to support the work of the Police and the existing camera network. Each venue purchased a hand held radio which links to other venues, to Police on foot patrol and to the Safety Camera office where a base station was set up. Feedback from Police and venues indicated that the program had some very useful outcomes and should be continued, but these claimed benefits remain anecdotal rather than being properly researched outcomes.

ID scanners

ID scanners have now been installed by the owners of 'high risk' venues in Geelong. The scanners are programmed to recognise 154 different types of ID from around the world and can pick-out fake or altered IDs. These devices are being keenly embraced by both the licensees and Police, yet there are no formal or independent evaluations of their effect under way, either locally, nationally or internationally. This is a significant new development. While some other licensed venues are experimenting with ID scanners in Australia and internationally, Geelong has developed a far more structured approach and for this reason is attracting considerable interest indicating the importance of proper evaluation of this development.

Lock-downs and dry zones

Within the City of Greater Geelong, local law prohibits drinking in public. In addition to this, Liquor Accord signatories agree to fixed lock down periods prior to closing (i.e. not allowing entrance for 30mins before closing). This is a more minimalist approach than is taken elsewhere, including the current proposal for inner-city Melbourne. However, there is also considerable pressure from some local parties to introduce more stringent lock down regulations, which is meeting resistance from local licensees and threatens the viability of other collaborative work. Having solid evidence about the effectiveness of such interventions is vital to allow communities to move beyond constantly trialling the latest idea without understanding its consequences.

Safe Taxi Rank

The City of Greater Geelong currently operates one rank in central Geelong between 1am and 6am on Saturday and Sunday mornings. The rank has 2 security officers and there are currently plans to introduce an ID scanner in an attempt to reduce assaults on taxi drivers and passengers leaving the cab without paying. The effect of this Taxi Rank on night-time assaults and sexual assaults is yet to be evaluated.

As a part of the DANTE baseline study, data has been obtained from 3 sources which indicate alcohol-related harm:

1. Barwon Health Geelong Hospital Emergency Department presentations
2. Victoria Police (assault, drink driving and property damage offences)
3. Ambulance Victoria (alcohol/assault related attendances)

Emergency department attendances

This section examines all alcohol-related injury frequencies pre- to post-intervention in the Geelong area of Victoria, Australia, from 2005 to 2009. ARIMA time series were used to determine the effect of the interventions on ED attendances in Geelong.

Data

The ED-data was obtained in two formats: Triage records downloaded according to word searches of relevant databases, and ICD-10 data. Data included patient demographics, residential suburb, basic description of incidents, treatment and discharge details and alcohol/other drug involvement. Although the data contained indications of whether alcohol was involved in each instance, substitute measures were still required in order to aggregate the data into specific classifications relevant to this project. These categories were determined through case-by-case examination of triage records dating July 1, 2005 to July 31, 2009, as well as by triage ICD-10 codes for the period July 1, 1999 through January 31, 2008 (see Table 7).

Table 7 Frequencies of alcohol-related incidents by category and data source.

Alcohol-related Category	Triage *N*	ICD-10 *N*
Accident	842	-
Aggression	35	-
Assault	826	1315
Chronic	733	-
Domestic Dispute	18	-
Intoxication	765	1130
Mental Disorder	398	-
Suicide	-	665
Traffic Accident	146	-
NEC*	171	-
Total	3934	3110

*Not Elsewhere Classified

Frequency discrepancies between the two data-formats (ICD-10 codes and triage record notes) were evident at various overlapping time-points and were likely due to ED records being more comprehensive than the ICD-10 extraction which only included 'assault', 'intoxication' and 'suicide' categories, underestimating actual frequencies.

Analysis

Time-series auto-regressive integrated moving average (ARIMA) analyses of the potential impact on alcohol-related incident rates caused by any of four interventions were conducted using SPSS Expert Modeler. This program automatically selects the best fitting model for the data under scrutiny, taking into consideration ARIMA-models as well as exponential smoothing models. The independent variables were designated as dichotomous 'event' variables (0 = pre-intervention, 1 = post-intervention) and represented the four interventions: the police-licensee Night-watch Radio Program, the ID-scanners initiative at licensed venues, the Victoria Police Operation Nightlife 2, and the alcohol awareness campaign, Just Think. Due to the nature of interventions, it is theoretically possible that these programs would gradually pick up momentum and impact from the date of implementation as training and fine-tuning of the initiatives would undoubtedly occur along the way. For this reason, the 0-1 transfer function used for the IVs is

somewhat inelegant. This, however, appears to be the only option, as there is no indication of when these interventions might have been at their fullest and most fluent working capacity. Further, the somewhat sporadic nature of the Just Think campaign activity means that it is difficult to assume that the intervention would have a sustained effect over time.

Results

Frequencies and demographics

There were 3934 triage presentations involving alcohol between July 1, 2005 and July 31, 2009. The age-range spanned from 10 to 95, with a mean age of 37, and a mode age of 20. The age-group 15-24 was the largest and comprised 30.1 per cent (n = 1185) of all cases. This was more than one third as much as the next largest age-group, 25-34 year-olds, which accounted for 18.9 per cent (n = 742) of the sample. Males were more than twice as likely to be involved in alcohol-related triage cases than were females, with 68.9 per cent (n = 2710) of triage presentations being male, and only 31.1 per cent (n = 1224) being female.

Alcohol-related injuries by time of day & day of week

Most (58.5 per cent n = 2302) of alcohol-related incidents took place on the weekends. As indicated in Figure 6, Sunday was the day of the week with the highest rate of incidents (24.5 per cent ; n = 965), most of which (55 per cent ; n = 529) occurred between the hours of 12am and 6am (see Figure 7). Saturday night between the hours of 11pm and 12am also had a relatively high rate of alcohol-related injuries (n = 80).
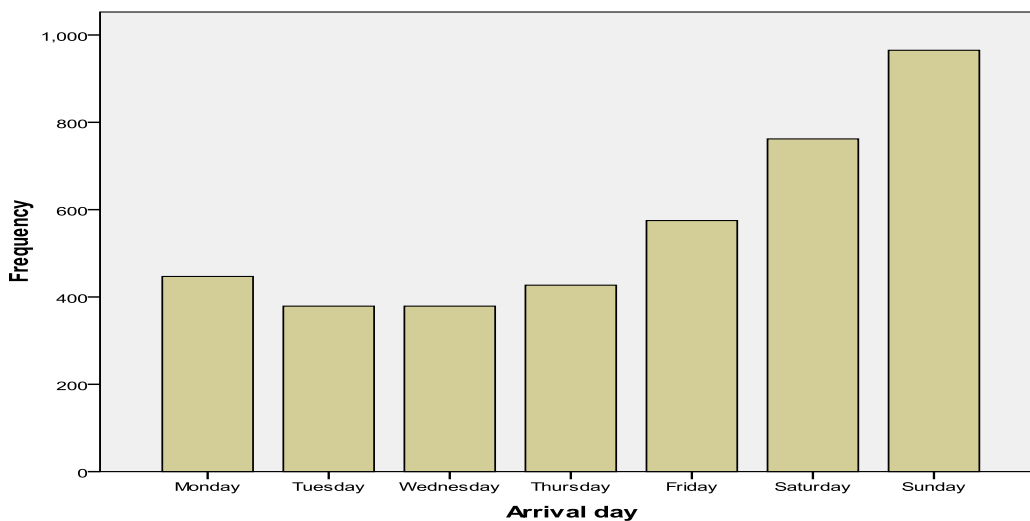
Figure 6 Frequency of alcohol-related injuries by day of week.
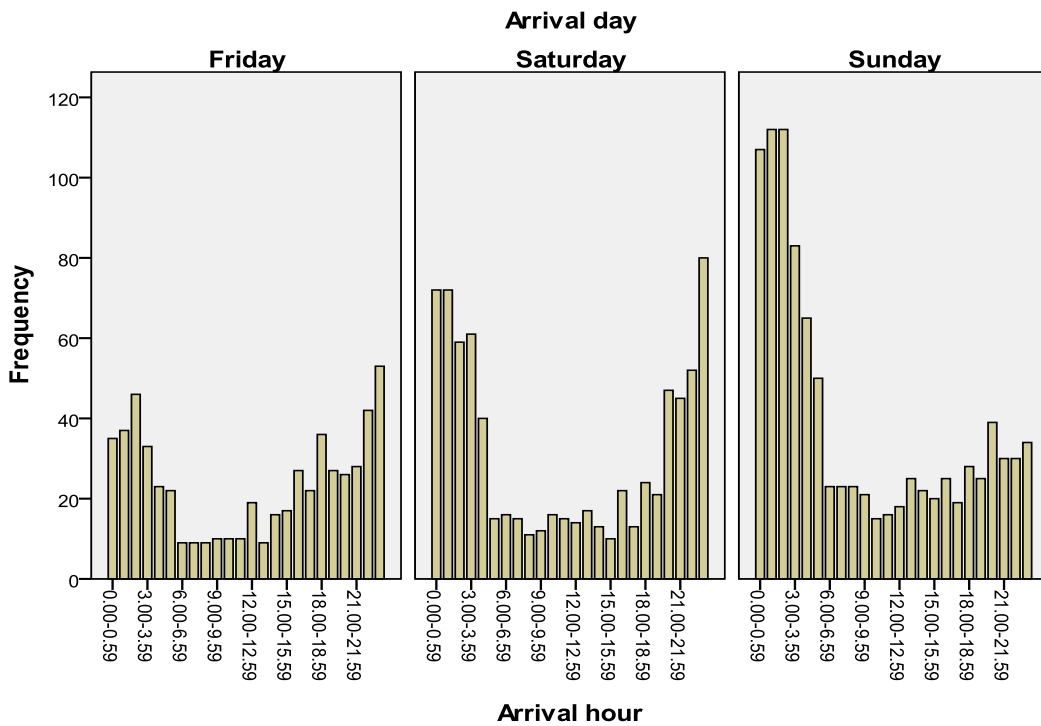
Figure 7 Frequency of alcohol-related injuries by hour and weekend day.

Figure 8 shows seasonal trends through monthly averages demonstrating an annual peak in January, followed by a drop in February. Events such as New Years Eve celebrations, annual holidays and a lack of students in the Geelong area during February may contribute to this annual trend. Further, there is a clear trend of reduced numbers of alcohol-related injuries in the colder months (May-October).
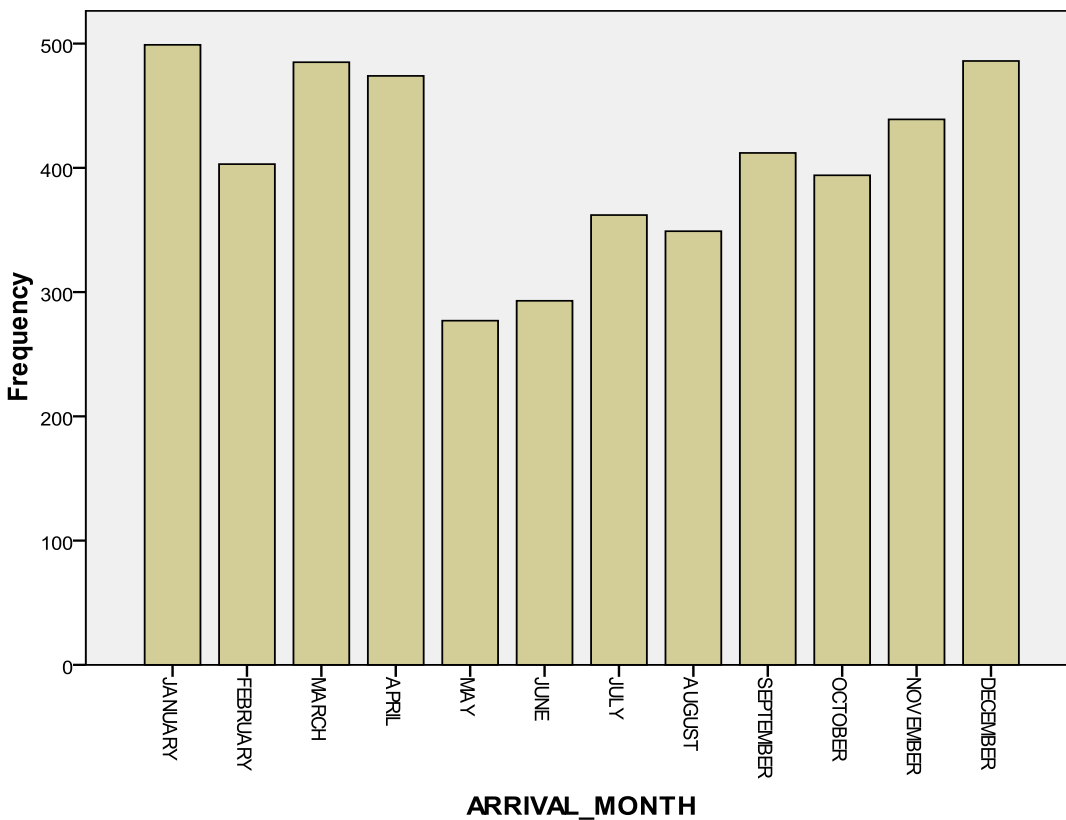
Figure 8 Monthly average frequency of alcohol-related injuries.

Alcohol-related injury rates over time

Figure 9 reports the frequency of alcohol-related incidents as represented by triage records (thick line) and ICD-10 code records (thin line). Reference lines for each of four interventions implemented in 2007, 2008 and 2009 are inserted. Regression lines (Figure 11 and Figure 12) indicate an upward trend in the frequency of incidents over time with positive correlations of R^2 = .70 and .44 for triage data and ICD-10 data respectively. The increase in observed alcohol-related injury occurred within the context of relatively stable numbers of overall attendances at the Emergency department for all causes (see Figure 10).

Figure 9 Alcohol-related cases by month and year.

Figure 10 Monthly attendances at Geelong ED – All cases

Time-series (ARIMA) analysis

ARIMA analyses were conducted on triage data because of its greater sensitivity to determine pre- to post-intervention differences in the data. For this type of analysis, it is typically recommended to have at least 50-100 data points, and the data was therefore aggregat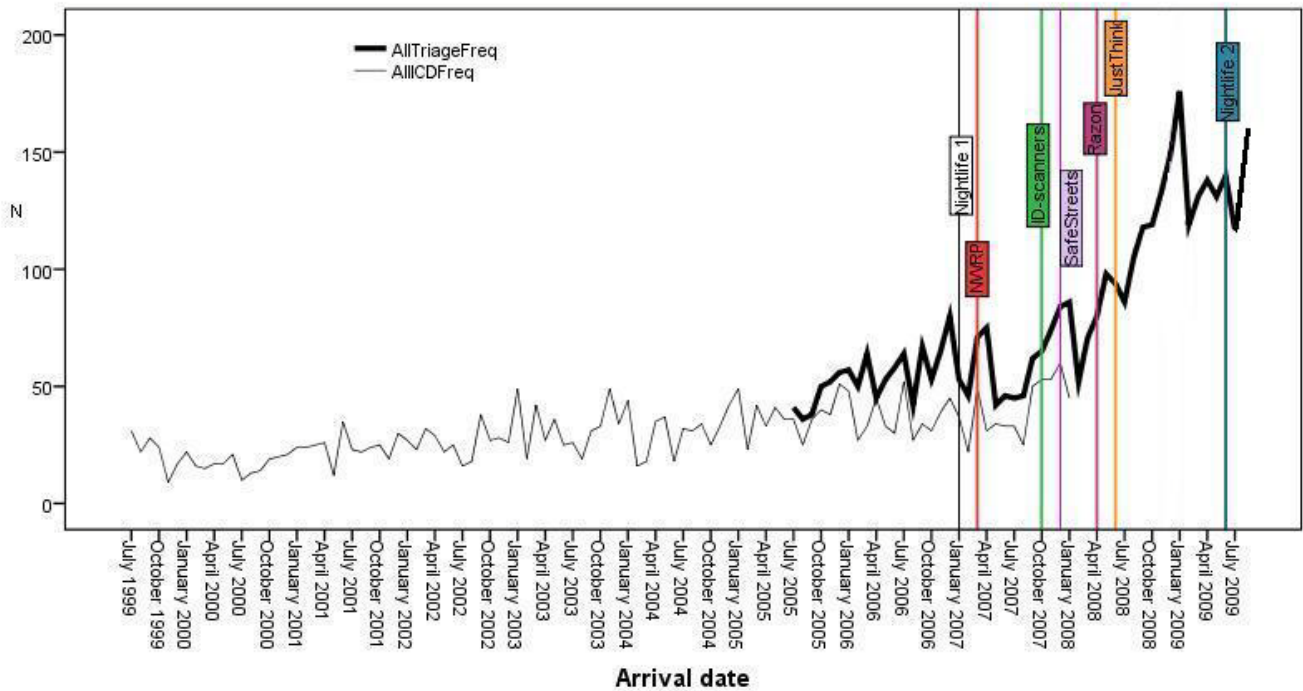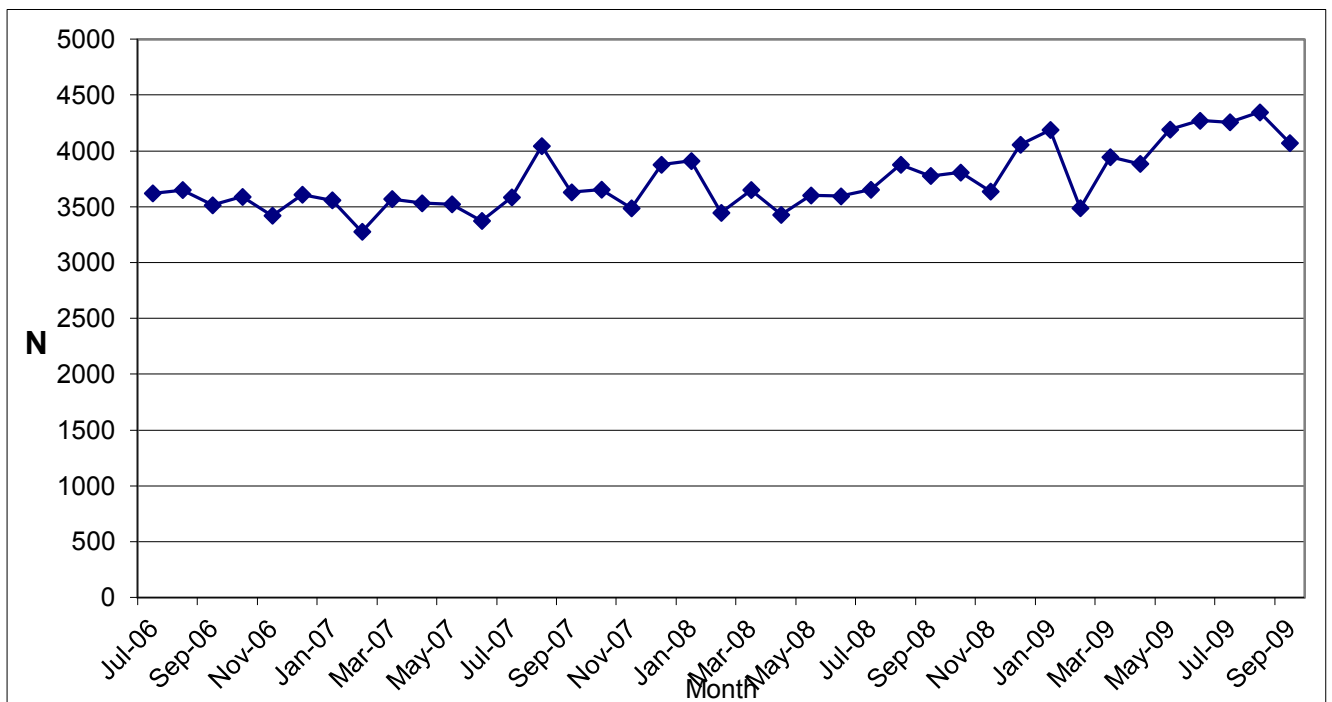ed by week rather than month, and thus consisted of 214 observations through the time-frame of 1 July, 2005 to 31 July, 2009. The model was specified as ARIMA (0, 1, 1). No outliers were detected and the model was thus correctly specified as indicated by the non-significant Ljung-Box statistic of $p = .49$.

The analysis identified only the ID-scanner intervention as a significant predictor with $t = 2.31$, $p < .02$. The model overall produced a stationary R^2 of .39, and thus fit the data relatively well. It should be noted, however, that although ARIMA analysis can determine pre- to post-intervention differences while taking into account a relatively wide variety of factors, it is nonetheless difficult to attribute a causal association between data variance and an intervention based on this statistical procedure alone when examining an uncontrolled environment. Presented with the visual representations of the data (graphs, scattergrams, etc.), however, the ARIMA results do aid overall interpretation (see Figure 14).
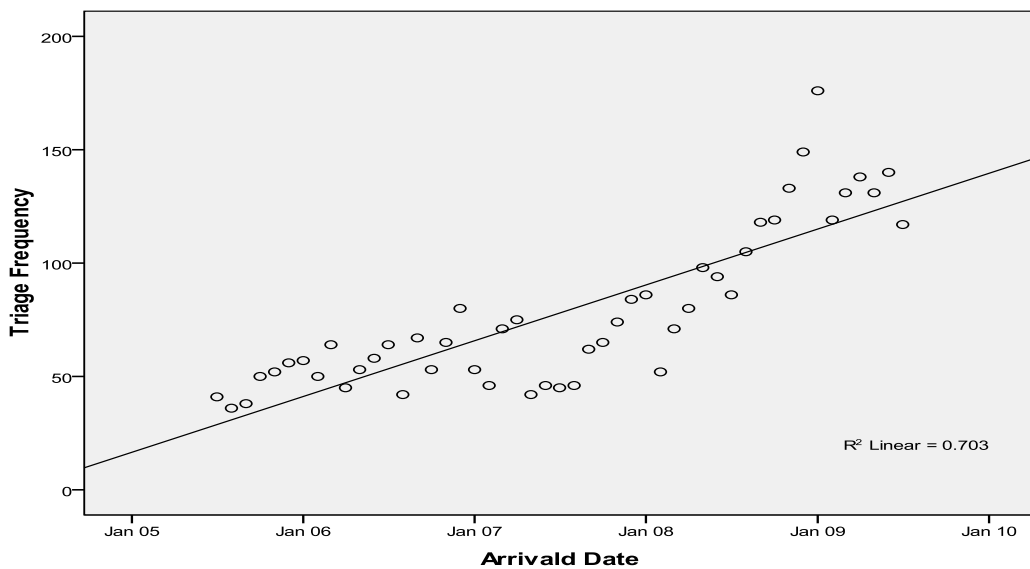

Figure 11 Triage data. Frequency of alcohol cases by date with regression line
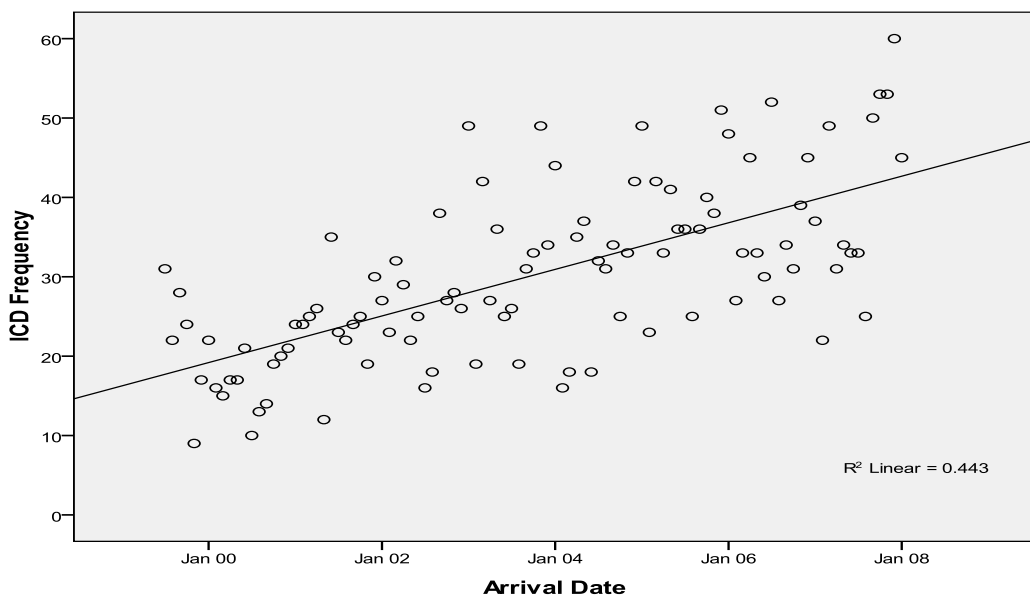

Figure 12 ICD-10 data. Frequency of alcohol cases by date with regression line.
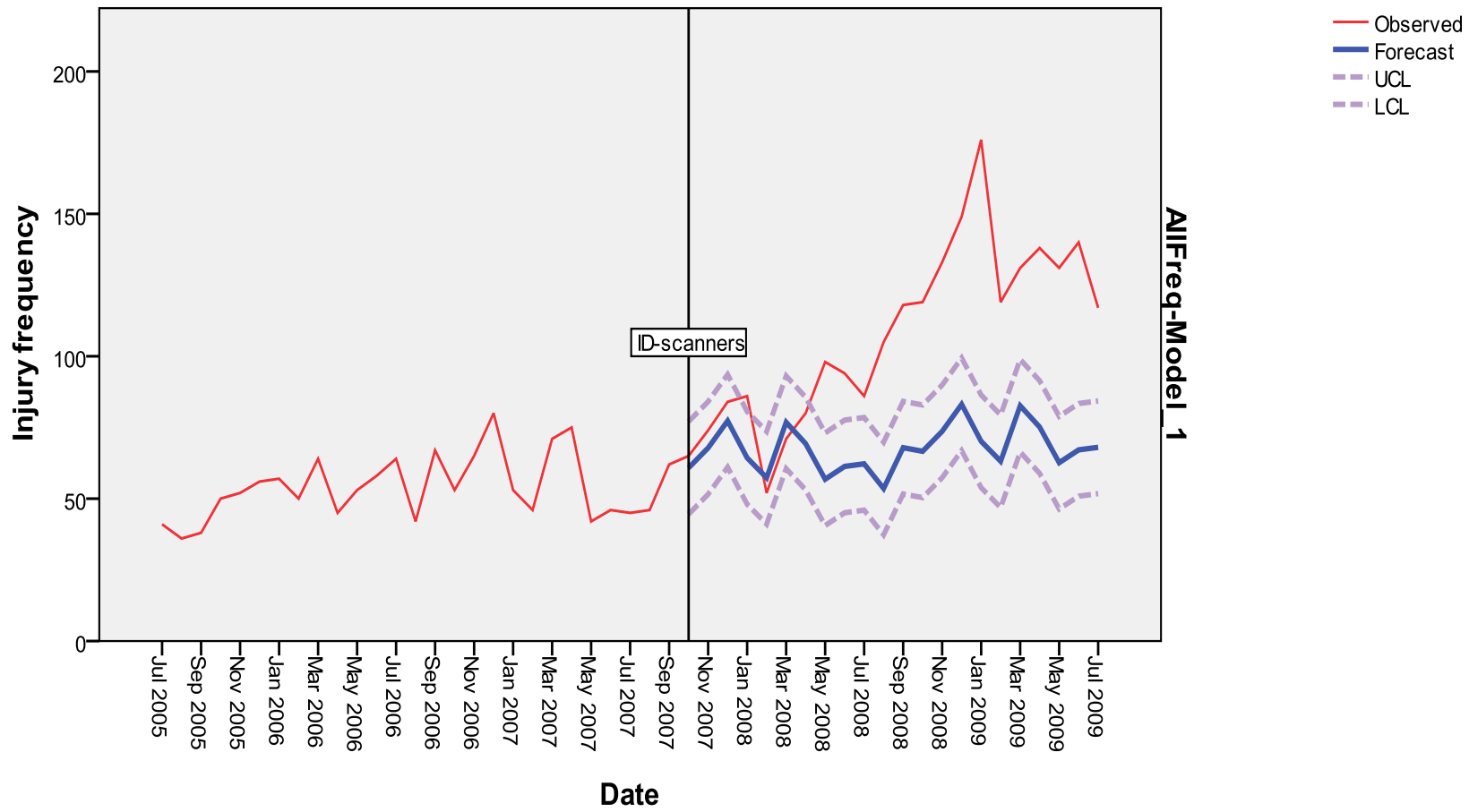
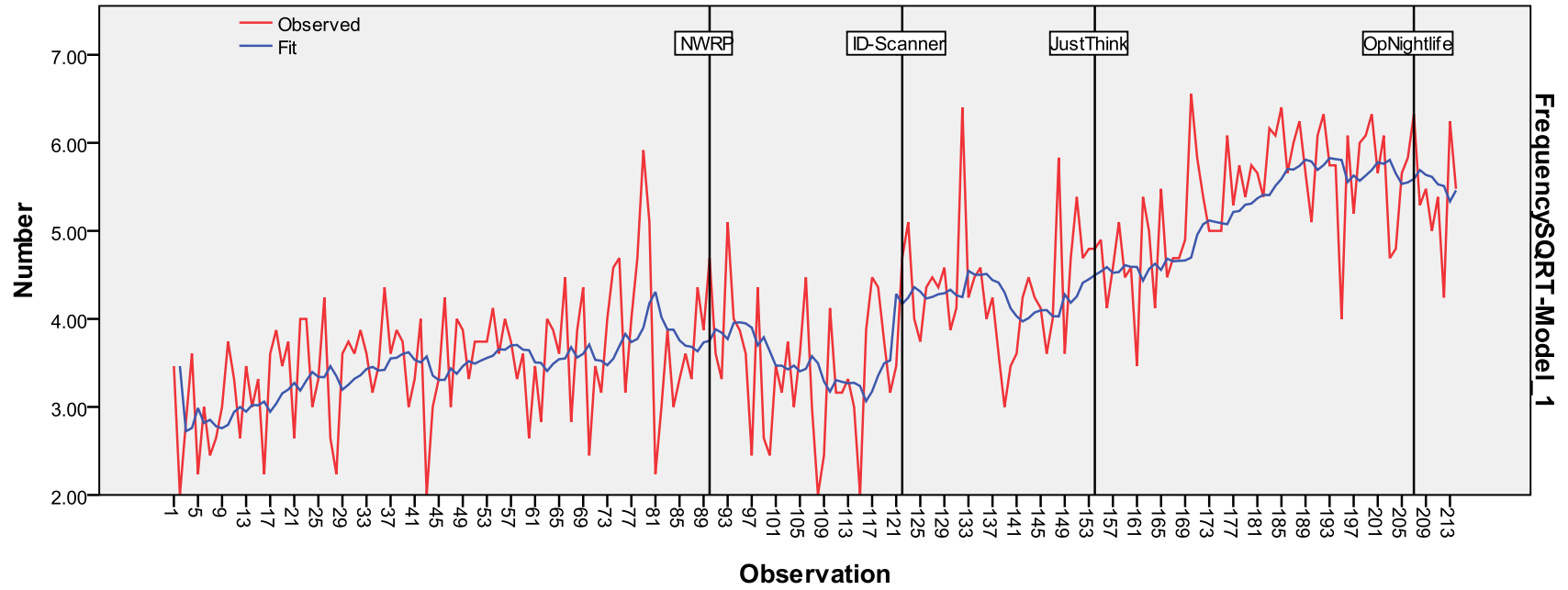**Figure 13 ED-data with forecast and observed values for ID-scanner intervention.**

Figure 14 ARIMA model and transformed (normalised) ED data.

Discussion

Alcohol-related injury emergency department presentations in the Geelong region have risen consistently since 2005. Further, none of the interventions implemented in Geelong coincide significantly with any sustained decrease in alcohol-related injury rates.

The ID-scanner initiative was associated with a statistically significant rise in injury rates (see Figure 14). However, the effects identified in the analyses clearly commence around 6 months after the implementation of the ID scanners, when there was no new interventions put in place. It is possible that ID scanners had a delayed effect through problematic patrons becoming banned from venues over time and subsequently causing more problems outside venues. Another explanation might be that violent people who attend licensed venues, but are violent regardless of alcohol consumption, may choose to initiate fights away from such surveillance. Similarly, the system of banning problem patrons from central nightclubs may mean these people have been displaced to venues outside the main entertainment area where there is less surveillance and capacity to deal with problems. However, most explanations do not appear very feasible and it is likely that the association between the implementation of ID scanners and an increase in alcohol-related ED presentations is coincidence.

Importantly, the findings presented here tend to reflect statewide trends, although data available for this project is more recent than those available at a state level. Available data from the Victorian Department of Human Services Victorian Emergency Minimum Dataset (VEMD) database (Victorian Department of Human Services, unpublished) demonstrates that alcohol-related presentations at Emergency Departments across the state began climbing in the year June 2005- July 2006 (Miller, et al., 2010a). Few comprehensive explanations for this trend across the state have been forthcoming (Livingston, 2008b; Livingston, et al., 2007; Livingston, et al., 2008). One element of the increase in ED attendances has been improved reporting practices of domestic violence incidents and sexual assaults. However, the observed trends observed in Geelong are unlikely to be attributable to sexual assault as only 0.5 per cent of all alcohol-related cases fell under this category.

In summary, as observed in all previous research, there appears to be little overall effect from community-based intervention on alcohol-related injury presentations at the ED. The ad-hoc nature of the implementation of these measures, along with the overwhelmingly positive message being sent through the popular media and advertising regarding alcohol consumption in Australia makes these findings not altogether surprising.

Limitations

There are a number of limitations with this study. First, ED data underestimates the actual frequencies of alcohol-related injury. Injuries sustained as a result of alcohol intoxication do not always require medical attention, and if they do, it is not uncommon for people seek medical help the following day through private clinics. Second, ED-data is recorded by medical staff whose main objective is patient assessment and immediate treatment, rather than noting any alcohol-involvement. Third, many of the interventions being evaluated in this study have not been implemented in a consistent manner. For example, the Just Think campaign was implemented on an ad-hoc basis and activity fluctuated depending on funding and reporter/editor/marketing department interest. Finally, the data cut-off point is July 31, 2009, one month after the implementation of Operation Nightlife 2, and any inferences about any potential effect of this intervention are therefore based on very little data.

Assault

Method

This section examines all alcohol-related injury frequencies pre- to post-intervention in the Geelong area of Victoria, Australia, from 2005 to 2009, as indicated by Geelong hospital Emergency Department (ED) triage records.

Data

Data for the study was obtained from Barwon Health Geelong hospital records for the dates of 1 July, 2005 through 31 July 2009, as well as from Victoria Police for the dates of 01 July 2004 to 30 June 2009. Key-word searches of the triage records targeting cases of alcohol-related violence were conducted, and produced at total of 826 cases. As the subject of the current study is to examine the effect of the mentioned interventions on assault-rates in the Geelong night-time economy, the data was further aggregated to include only those cases which occurred within the 'high alcohol hours' of 8pm-6am Friday to Sunday morning (Laslett, et al., 2007). This resulted in a total of 536 ED-cases and 588 police-cases. It should be noted that Victoria Police data refer to incidents (rather than 'counts') and report on all Assault codes recorded in the Victoria Police LEAP database (excluding sexual assaults). It should be noted that official statistics normally report 'counts' – or the number of charges laid as a result of the incident, however, as this data is being compared with ED data, it was felt more appropriate to refer to incidents.

For the triage data-set, the age-range spanned from 15 to 77 with a mean age of 27, and a mode age of 20. The age-group 15-24 comprised over half of the entire set of instances with 56.7 per cent ($n = 304$) of this age. Males were far more frequently involved in assault cases than were females, with 77.8 per cent ($n = 417$) of triage presentations being male. The data supplied by Victoria Police lacked sufficient detail to generate similar demographics.

Analysis

The study was conducted in two stages. Firstly, descriptive statistics including assault-rates by year were presented in time-line graphs for the dates of the obtained data. Secondly, pre- to post-intervention effects were assessed using linear regression analysis.

While a time-series analysis of the data would have been ideal and probably more direct than regression analysis, a fundamental assumption of this technique is the presence of serial autocorrelation and data-stationarity. Durbin-Watson tests, however, indicated no significant autocorrelation in the ED-data ($d = 1.866 > d_{u,\,0.05} = 1.806$) or in the Victoria Police data ($d = 2.116 > d_{u,\,0.05} = 1.780$), and stationarity was unobtainable through differencing or log-transformations. For these reasons, a time-series approach was unfeasible. As a result of using linear regression analysis to assess pre- to post-intervention effects, a causal relationship could not be attributed between the implemented interventions and the frequency of assault. The analyses could determine, however, whether assault-rates post-intervention were significantly different to the rates pre-intervention.

Results

Utilising data from Victoria Police for the Geelong postcode, the frequency of assaults for time of day (Figure 15), day of week (Figure 16), and month (Figure 17) were determined. As shown, the highest frequency of assaults occurred during the hours of midnight and 1:00am, with assault rates remaining relatively high until 4:00am. The day of the week with the highest assault-rates was Sunday. Lastly, the month with the highest frequency of assault rates is January. The lowest frequency of assaults occurs during 6:00am to 11:00am, on Tuesdays and Wednesdays, and during the month of May.
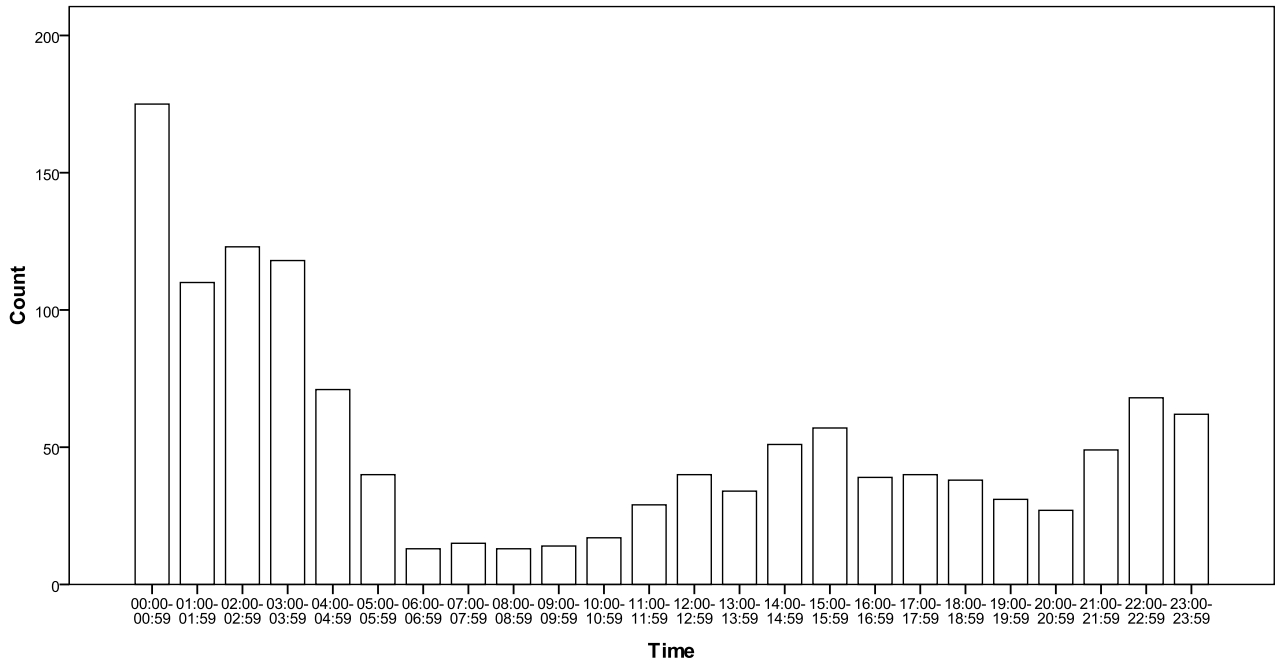
Figure 15 Assault frequencies for time of day
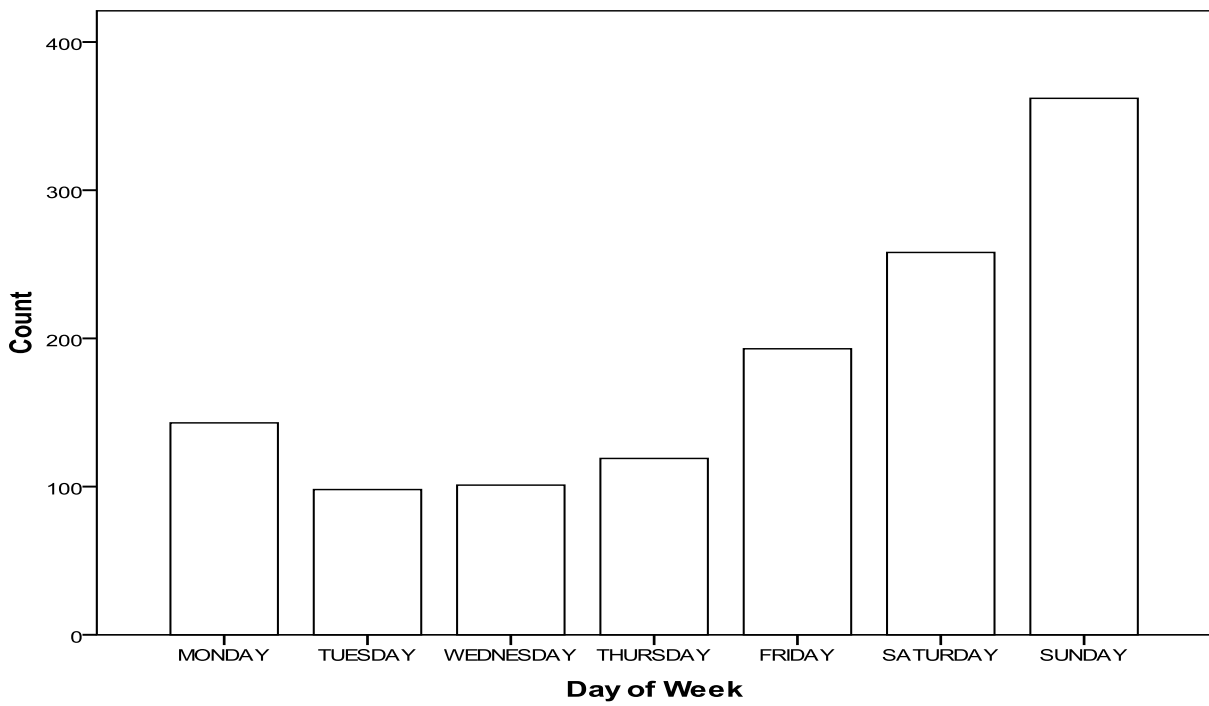
Figure 16 Assault frequencies for day of week
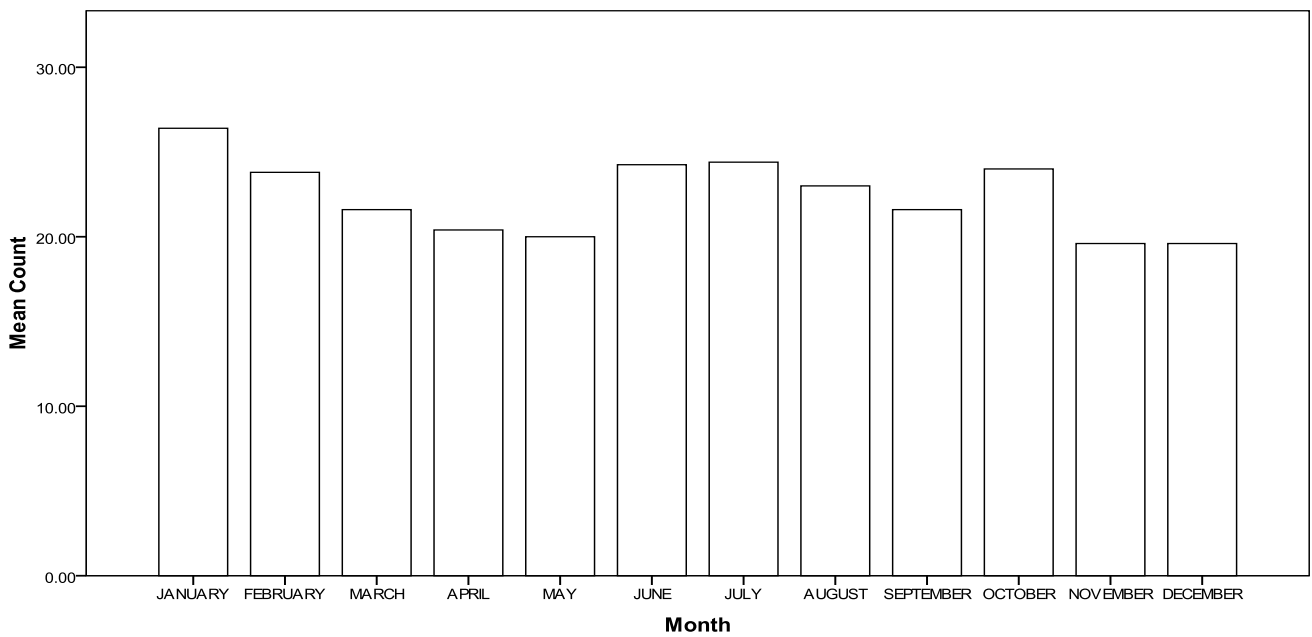
Figure 17 Assault frequencies for month of year

Assault location

While the CBD accounted for most of the assaults in the Geelong-Surf Coast region (n=1309, 25.8 per cent), it was closely followed by areas such as Corio (n=1209, 23.9 per cent) and Whittington (n=560). Assaults most commonly occurred in private residence (n=1839, 36.3) followed by street (n=1428, 28.2 per cent), retail premises (n=293, 5.8 per cent) and then licensed premises (n=271, 5.4 per cent).

Alcohol-related assault rates by year

Figure 18 (next page) demonstrates the frequency of assaults during high alcohol hours, taken from Geelong police data, and emergency department triage and ICD data, with reference lines for each of the four interventions implemented in 2007, 2008 and 2009. Figure 19 demonstrates these rates at high-alcohol hours, using triage and police data. Visually, none of the interventions appear to have had a lasting, if any, impact at all on assault rates. Although Operation Nightlife 2 precipitates a slight decrease in June-July, 2009, there is not enough data past this date to support a continuation of such an effect.
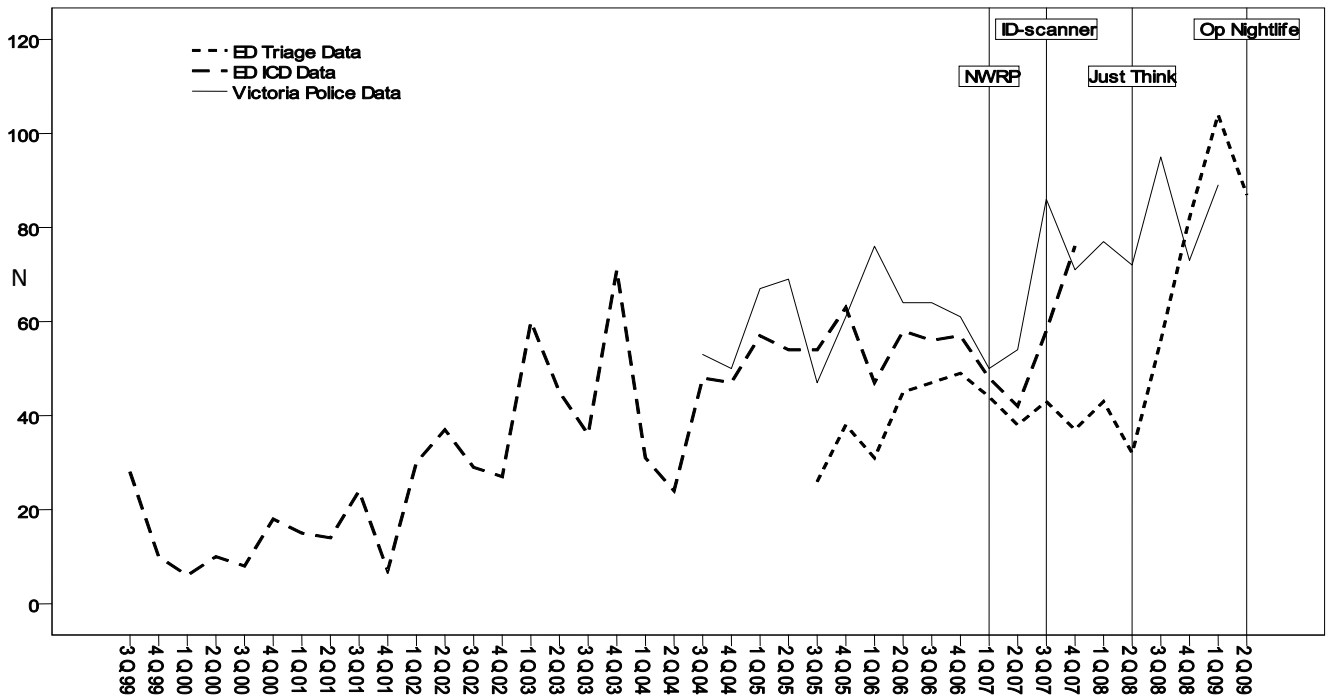
Figure 18 Alcohol-related assault ED attendances and police assault incidents during high alcohol hours by quarter and year
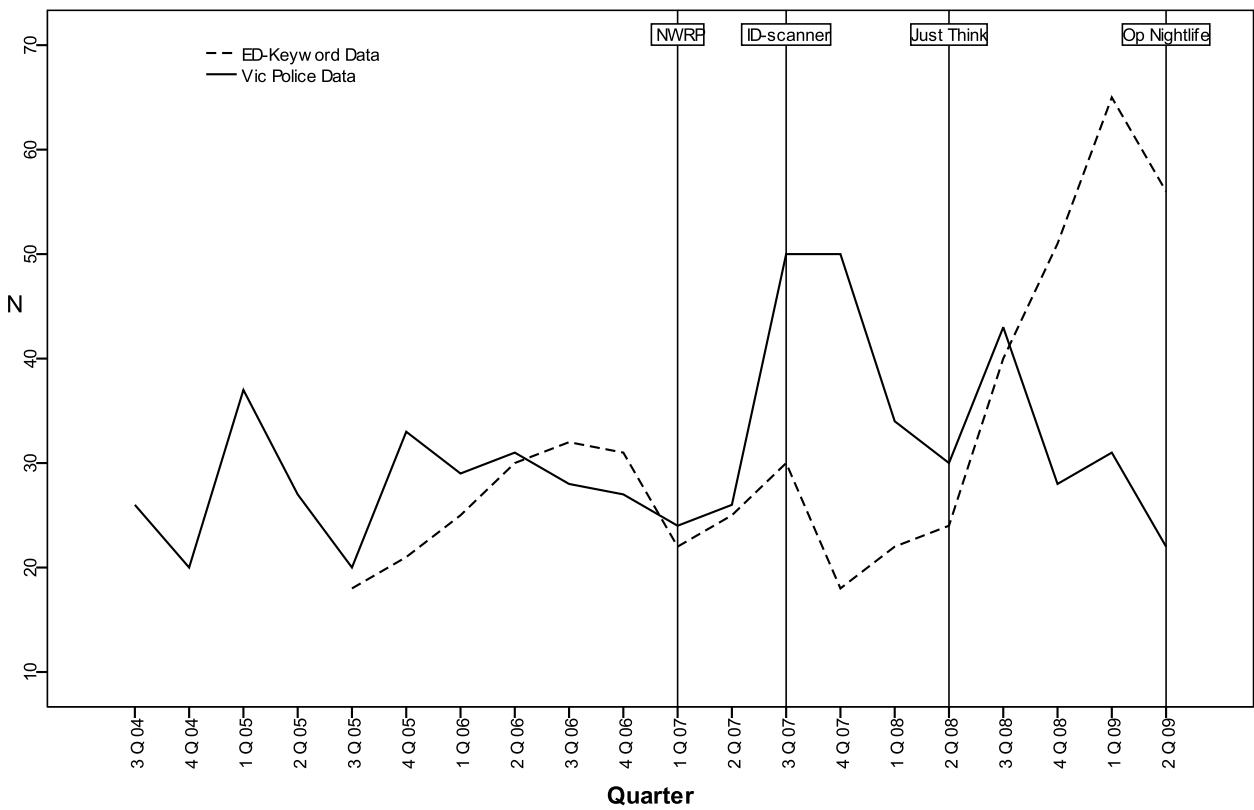
Figure 19 Quarterly assault incidents during high alcohol hours.

Regression analysis

Linear regression analyses of the data were conducted to help ascertain the practical influence of the implemented interventions (IVs) on alcohol-related assault rates (DV). IVs were represented by dummy variables coded 0 = pre-intervention, and 1 = post-intervention. The analysis was performed using SPSS Regression, and SPSS Frequencies was used for evaluation of assumptions.

To obtain enough cases for the regression analyses, the time-series were aggregated by week instead of month, and thus consisted of 214 data points through the time-frame of 1 July, 2005 to 31 July, 2009 for the ED-data, and 254 data points through the time-frame of 01 July 2004 to 30 June 2009 for the Police data. An examination of z-scores (critical value +/-3.29) revealed four outliers for the ED-data and 11 for the police data. The outliers were recoded to the second-most extreme value.

Assumptions of linearity and homoscedasticity of residuals were met. As assault-frequency for both data-pools was positively skewed, square root transformations were undertaken to normalise the distributions for the NWRP and ID-scanner IVs, while a logarithmic transformation was required for the Just Think IV. The distribution for the Operation Nightlife 2 could not be normalised and for this reason – as well as the fact that there is only one month worth of post-data – this intervention was not included in the analyses.

ED-data Regression

Two separate regression analyses were conducted, the first to examine the impact of NWRP and ID-scanner interventions, and the second to examine the impact of the Just Think campaign. These regression models used the weekly aggregated data for high-alcohol hours. The first regression model for the ED-data revealed a significant R^2 = .04 (R^2 adjusted = .03), $F_{(4, 212)}$ = 3.76, $p < .025$ for the NWRP and ID-scanner IVs. Overall this model thus explained only 4 per cent (3 per cent adjusted) of the variability in alcohol-related assault rates. The second regression model for the Just Think campaign generated a significant R^2 = .17 (R^2 adjusted = .17), $F_{(4, 212)}$ = 38.87, $p < .000$, thus accounting for 17 per cent of the variability in assaults during high alcohol hours. As indicated in Table 8, only the Just Think campaign generated a significant, unique effect on the rates of alcohol-related assault.

Police-data Regression

The police-data regression generated no significant results for the overall regression model or any of the individual IVs. While both the NWRP and ID-scanners interventions were positively correlated with assaults during high alcohol hours, these correlations were not significant. Further, the Just Think campaign had no effect on alcohol-related assault rates (Table 8).

Table 8 Linear regression analyses of pre- to post-intervention data

	Police-data			ED-data		
Intervention (IV)	B	β	sr^2	B	β	sr^2
Night Watch Radio Program	.11	.08	.22	.01	.01	.07
ID-scanners	.10	.07	.20	.26	.18	.35
Second regression model						
Just Think Campaign	-.01	-.00	.00	.52	.41	6.4*

Note. * $p < .001$; ED-data df = 210; Police-data df = 251

Discussion

The current study examined the effect of several community-level interventions on rates of alcohol-related violence in Geelong using emergency department (ED) and police data. Within the Geelong postcode (where the nightclub district is located), the highest frequency of assaults during high alcohol hours occurred during midnight and 1:00am, on Sunday mornings. Seasonal trends were apparent, noting a peak during the traditional summer holiday month of January. Alcohol-related assault emergency department presentations in the Geelong region have risen consistently since 2005. None of the implemented interventions in Geelong have resulted in any sustained decrease in alcohol-related injury rates. The 'Just Think' social marketing campaign was associated with increasing rates of assaults associated with alcohol use, although causal attributions cannot be made in this context. Therefore, it certainly seems clear that the interventions investigated have not been able to significantly curb alcohol-related assaults.

The reasons underlying the absence of an effect due to these interventions are open to speculation. The most likely explanation is that none of the interventions addresses alcohol consumption across the community. Interventions which do address total alcohol consumption have consistently been found to be the most – if not the only - effective measures for reducing alcohol-related violence (Anderson, et al., 2009a; Babor, et al., 2003; Babor, et al., 2010; Graham & Homel, 2008a). Alternatively, it is possible that in the context of increased surveillance through technologies such as ID scanners, CCTV and linked radios, people who attend licensed venues and display violent behaviour have shifted to fighting away from any surveillance. Similarly, the system of banning people from central nightclubs may mean such people have been displaced to venues outside the main entertainment area. Another possibility is that the overt and extensive surveillance afforded by security personnel, ID scanners and CCTV at licensed venues may instil in patrons irrational expectations of crime or violence, thus raising anxiety levels and in turn fostering a potentially overzealous interpretation of innocent interpersonal exchanges as threatening. This could in turn warrant some form of counter-aggression or defensive action ultimately ending in violence and injury.

Similarly, the highly publicised examples of alcohol-related violence frequently used for the Just Think campaign and splashed all over the front pages of the local tabloid newspaper might be increasing the anxiety and apprehension levels of people engaging in the night-time economy. For example, rather than offering practical solutions to avoid or diffuse potentially dangerous situations, the Just Think campaign appears to function by inciting fear through sensationalising worst-case scenarios. This could conceivably be making patrons more ready for violence, interpreting non-violent cues as aggressive because of their expectation that they are in an environment where alcohol has caused people to be more violent (Borders, et al., 2007; Leonard, et al., 2003; Quigley & Leonard, 2006). This could also lead to stronger, more violent responses to mild aggression (as is common in crowded alcohol-filled environments) because of fear of retribution.

In summary, in line with the current literature, there appears to be little overall effect from the investigated community-based interventions and alcohol-related assault. Of note is the increase, rather than a decrease, in alcohol-related assault rates after the implementation of the alcohol industry funded 'Just Think' social marketing campaign. The ad-hoc nature of the implementation of these measures, along with the overwhelming message regarding alcohol in Australia still being one of consumption until intoxication (Room, 1988) suggests these trends will continue without measures to reduce whole-of-community alcohol consumption.

Limitations

There are a number of limitations with this study. Firstly, it should be noted that both the ED-data and police-data most likely underestimates the actual frequencies of alcohol-related injury. This assumption is based primarily on the reality that injuries sustained as a result of alcohol intoxication do not always require medical attention and are seldom reported to the police. Such cases would therefore not be represented in either data-set. Another related issue, pertains to the fact that ED-data is recorded by medical staff whose main objective is patient assessment and immediate treatment, rather than noting any alcohol-involvement. For these reasons, it seems likely that a substantial proportion of alcohol-related cases go undetected.

Secondly, while the data forming the basis for the study help greatly in understanding the current and past situation in relation to alcohol-related violence in Geelong, there are other equally important information sources which are needed to provide a more complete and nuanced description of this problem. For example, ambulance records would be invaluable in providing insight into the instances of alcohol-related violence which are intercepted and resolved on the street rather than in triage.

Finally, consideration should be given to the fact that the interventions under scrutiny generally require some level of public participation to facilitate success. For example, the Just Think campaign is based on the notion of change in attitude towards alcohol-related violence through public awareness of the problem. This type of strategy thus requires time to gain momentum and to make an impact – perhaps more time than what was available at the time of data-collection for this study.

Property damage offences

Another harm to the community related to excessive alcohol consumption is damage to property from intoxicated persons. While there is often public acknowledgement of the property damage related to excessive alcohol consumption, there is little research on property damage trends or interventions which might reduce such offences. In addition, the majority of such incidents are not reported to police because of their comparatively minor nature, although they often represent real costs to individuals. Further, most economic analyses of the costs associated fail to consider property damage offences in their calculations of the costs of alcohol to society.

It has been suspected for some time that alcohol is involved in the origin of property damage incidents (Stevenson, et al., 1999). Previous research has found that even controlling for key social and demographic variables, property damage crimes occurred more frequently in areas with greater sales of alcohol. The effect of alcohol sales was considerably larger in Sydney than it was in country NSW. Similarly, an analysis of police records in NSW found that 58 per cent of all malicious damage offences could be linked to alcohol (Ireland, 1993). Overall, these findings are consistent with alcohol consumption playing a causal role in these offences, however, there are a substantial number of factors involved and recent alcohol consumption trends and trends in property damage within Victoria and Australia suggests that further investigation is required.

Within Victoria, it appears that overall property damage rates have been on the rise – at least according to the available data (see Table 9). Overall property damage rates have remained mostly stable, with a very small apparent increase under 5 per cent in most years.

Table 9 Property damage offences in Victoria

2001-2	2002-3	2003-4	2004-5	2005-6	2006-7	2007-8	2008-9
42,203	42,915	42,134	41,163	46,861	52,509	52,972	54,122

Source: Victoria Police Annual Report 2007/8 and 2008/9.[3]

Method

Data for the study was obtained from Victoria Police for the dates of 1 July, 2004 to 30 June, 2009. Victoria Police data analysed in the report here refer to incidents (rather than 'counts') and report on all property offences recorded in the Victoria Police LEAP database. It should be noted that official statistics normally report 'counts' – or the number of charges laid as a result of the incident, however, as this data is being looked along with ED data, it was felt more appropriate to refer to incidents. Overall, 12,700 cases during the study period.

Analysis

Analysis was conducted in two stages. Firstly, descriptive statistics including assault-rates by year were presented in time-line graphs for the dates of the obtained data. Secondly, pre- to post-intervention effects were assessed using linear regression analysis.

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[3] The Victoria Police report notes that: "The long term trend shows a relatively static number of Property Damage offences were reported between 2001–02 and 2004–05. However, there was an increase of almost 14 per cent between 2004–05 and 2005–06 and a further 12 per cent in recorded offences between 2005–06 and 2006–07. That increase was largely attributable to the impact of campaigns encouraging the reporting of the presence of graffiti (to facilitate its early removal). "

Results

Property offences in Geelong have increased over time (R^2=0.262), as demonstrated in Figure 20, with a levelling off/or reduction occurring since the start of 2009.
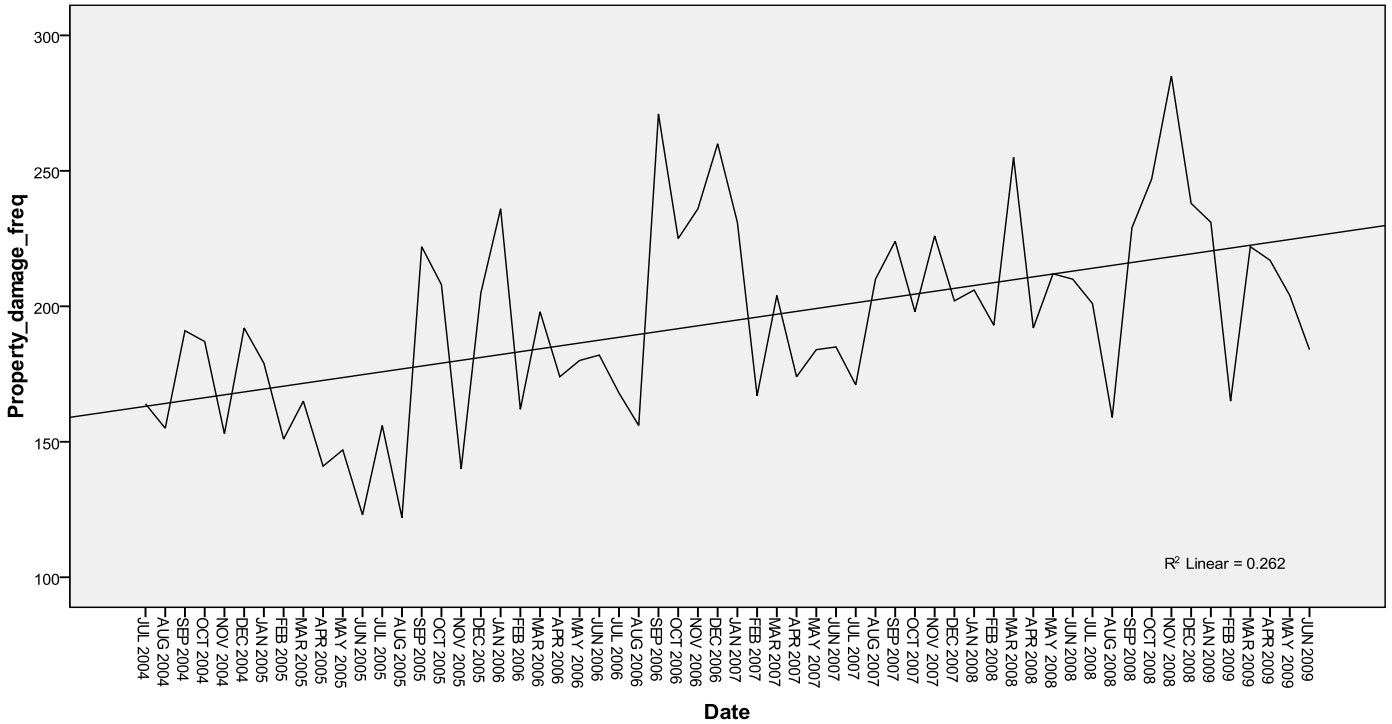
Figure 20 All hours property damage by month

However, the same trend is not evident in property damage offence during high alcohol times, which appears to have been reasonably steady ($r^2 = 0.004$) over the 5 years (see Figure 21). Further, property damage offences occurring in high alcohol times only account for around 20 per cent of all property damage offences.
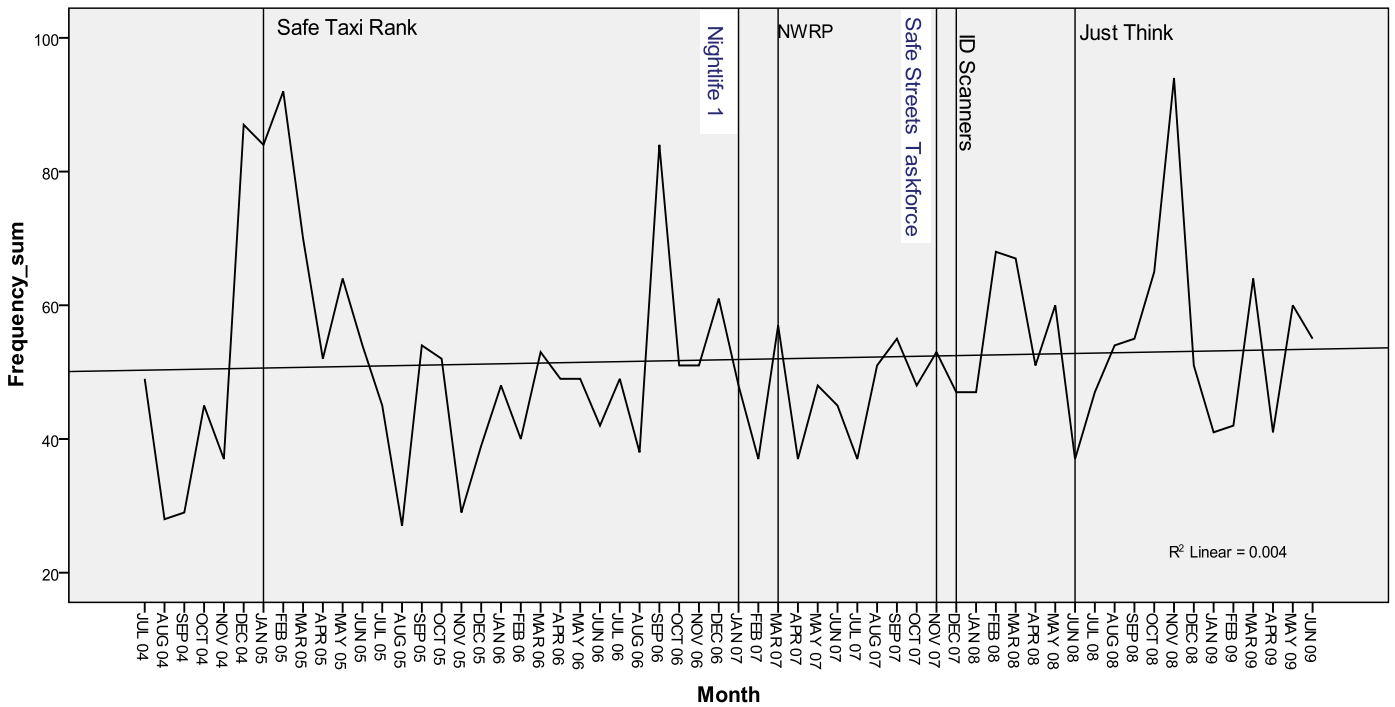
Figure 21 High alcohol hours property damage by month

Property damage offenders have primarily come from within the Geelong LGA and this proportion is increasing (see Figure 22). Unfortunately, data supplied by Victoria Police does not allow for further breakdown of age, gender or location trends.
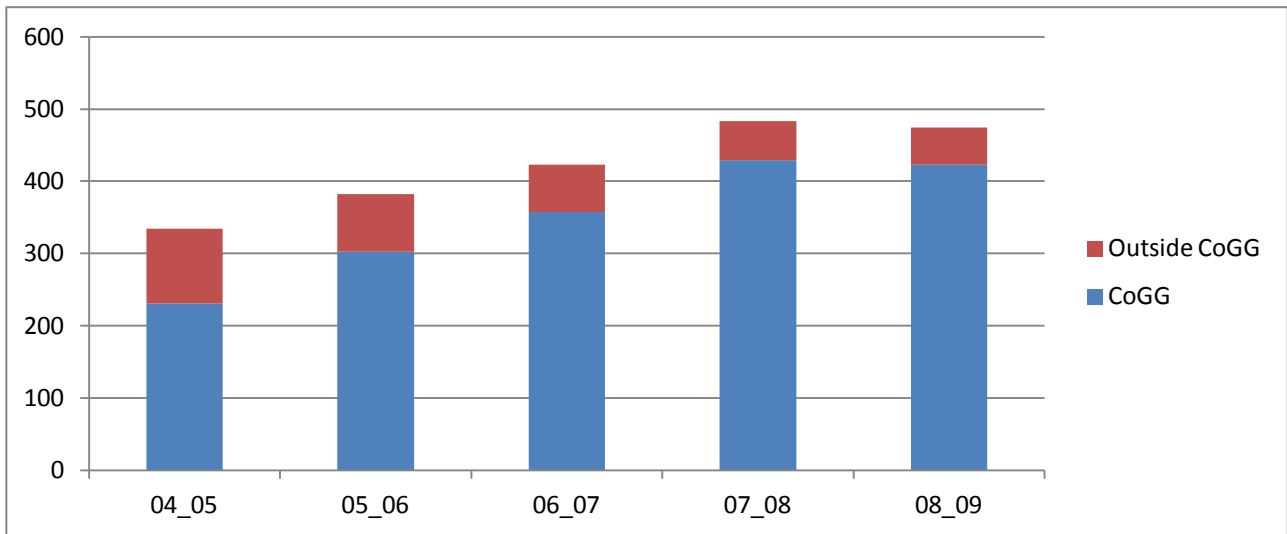
Figure 22 Offender postcode by year

Figure 23 highlights the fact that most property damage offences occur on Friday afternoon between 4 and 6 pm and Saturday night/Sunday morning. The Friday afternoon peak occurs outside high alcohol hours and suggests a different causal mechanism driving the offences.
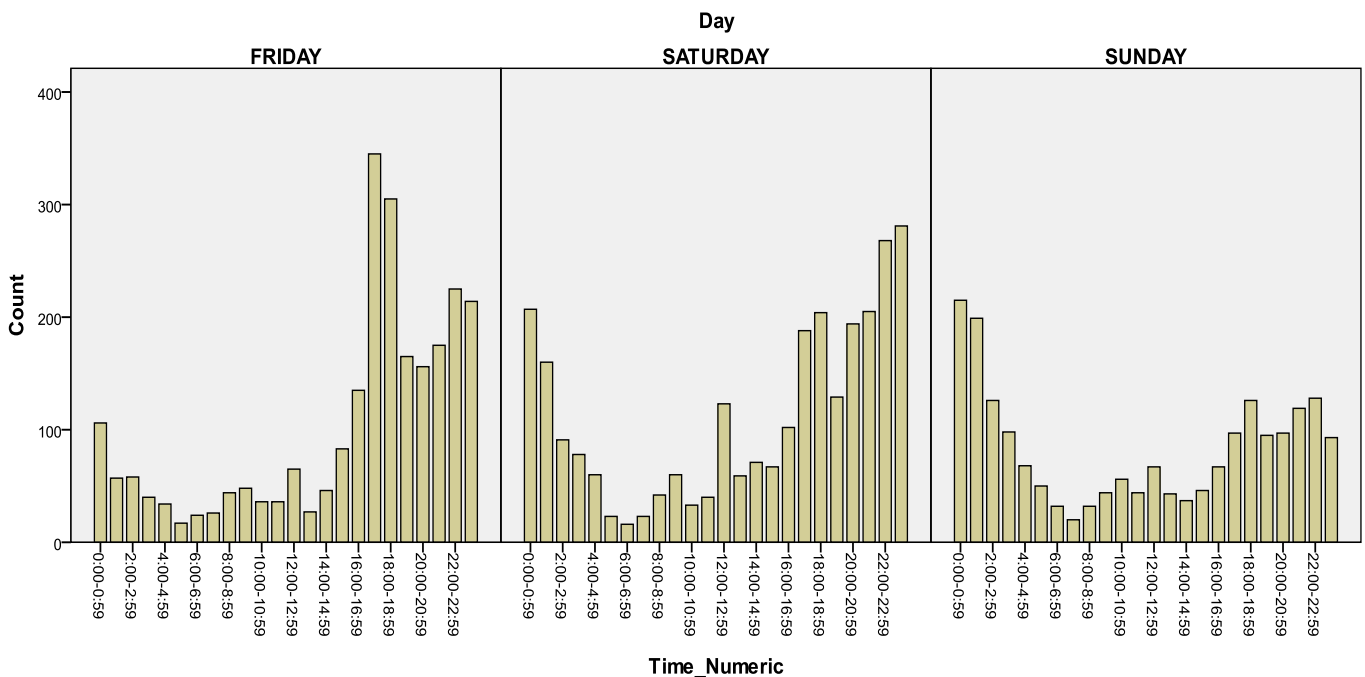
Figure 23 Property damage over weekend hours

During high alcohol hours, most of the property damage occurs in residential (private and other) settings, followed by public places and then retail outlets (see Figure 24).
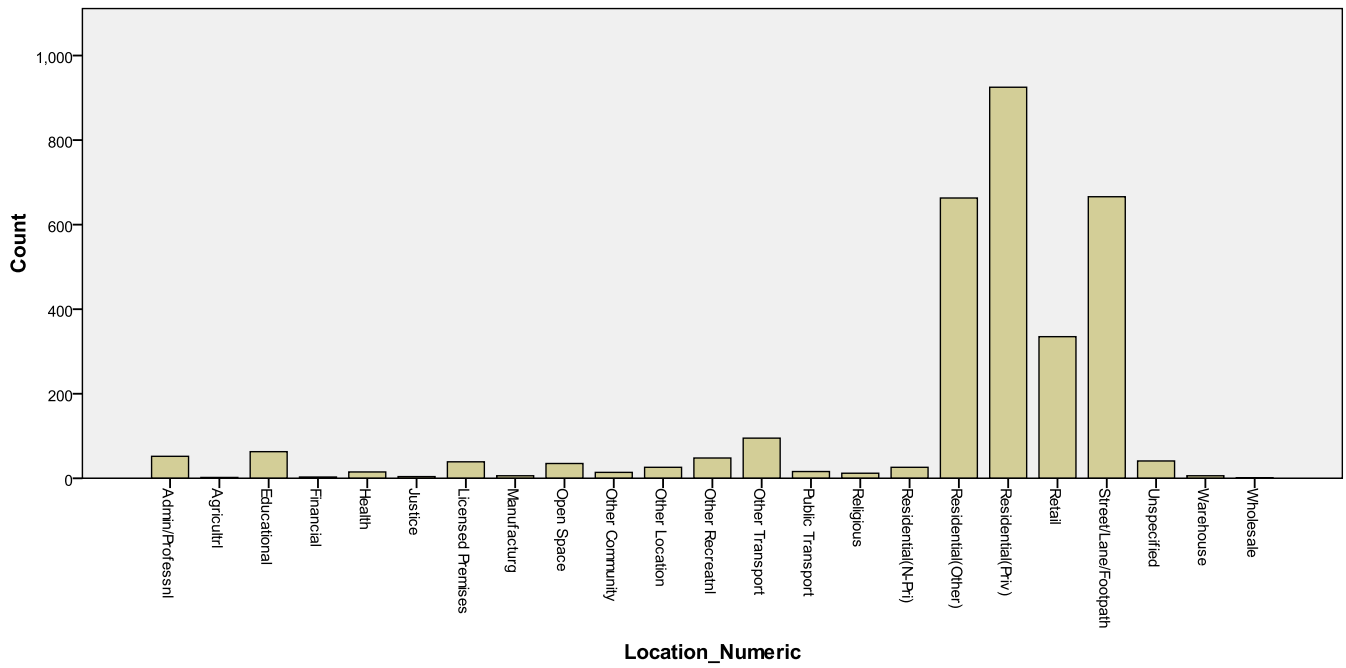
Figure 24 Property damage during high alcohol hours by location

Also of interest are the findings that most property damage occurring during high alcohol times, occurs in the residential suburb of Corio, followed by the city centre and surrounds (3220; see Figure 25).
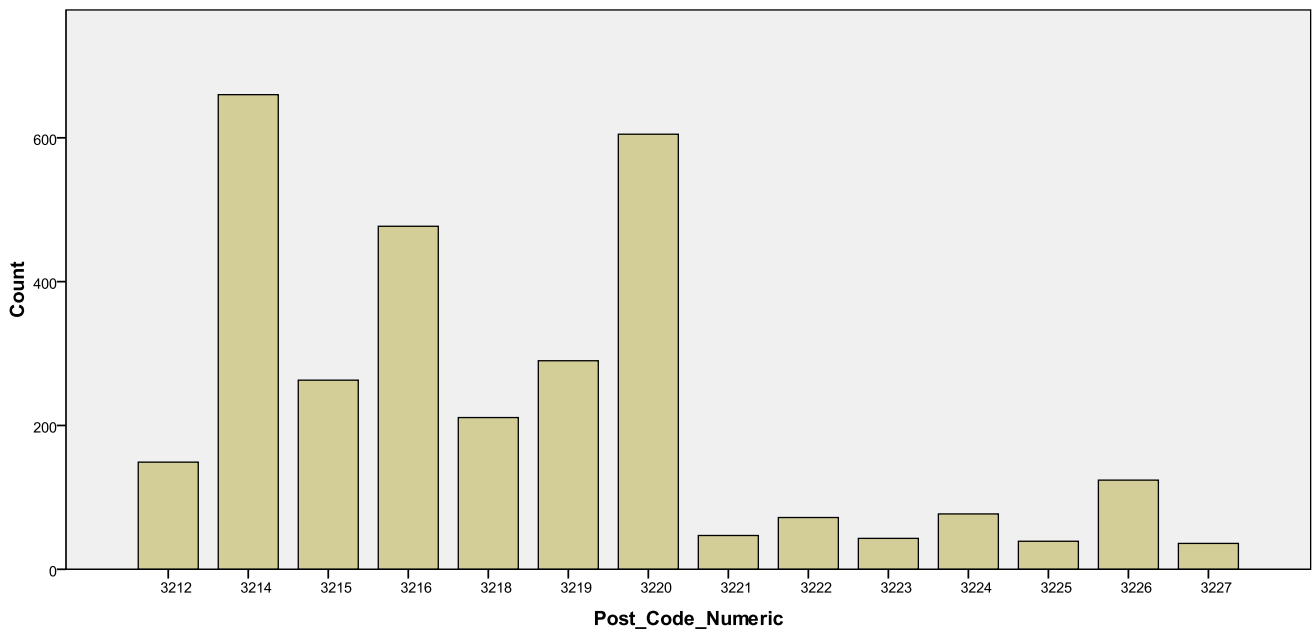
Figure 25 Property damage during high alcohol hours by post code

Discussion

Overall, high alcohol hours do not appear to be strongly related to property damage in Geelong, and while property damage offences increased up until mid-2007, they have levelled off since then. Although some offences occur within central Geelong, it is clear that the majority come from suburbs such as Corio, Norlane/North Shore and Whittington – all of which score high on socioeconomic disadvantage. It is therefore logical to assume that interventions focussed on licensed venues and alcohol would have little effect on property damage rate in Geelong, an assumption which is supported by the analyses.

These findings for the Geelong region reflect the statewide trends of relatively stable rates of property offences over time. They also suggest that while property damage offences occurring in high alcohol times only account for around 20 per cent of all property damage offences, this aspect of alcohol-related harm to the community remains a significant burden.

Drink driving offences

Method

This study examines DUI (driving under the influence) frequencies pre- to post-intervention in the Geelong area of Victoria, Australia, from 2005 to 2009, as indicated by Victoria Police data. In addition, data collected from the Geelong Hospital Emergency Department (ED) will be analysed for all traffic accidents where alcohol involvement was noted in case records. Data used in this report are thus derived from two sources:

1. Victoria Police data on drink driving offences
2. Barwon Health Geelong Hospital Emergency Department data

Victoria Police Data

Data for the study was obtained from Victoria Police data-bases for the dates of 1 January, 1999 through 31 July, 2009. A total of 9421 records were extracted.

The age-range spanned from 12 to 98 with a mean age of 33, and a mode age of 20. The age-groups of 18-27, 28-37, and 38-47 comprised 83.2 per cent of the entire set of instances with 18-27 year-olds being responsible for 41.3 per cent (n = 3894) of offences. 77.5 per cent (n = 7305) had no recorded prior DUI offences, while 14.1 per cent (n = 1324) had one prior offence, 5.4 per cent (n = 513) had two priors, and 2. 3 per cent (n = 279) had three or more DUI-offences on record with 5 persons having been caught drink-driving 14 times prior. Overall, males were far more frequently involved in DUI cases than were females, with 80.7 per cent (n = 7601) of all cases being male.

Data Limitations

A major consideration when investigating police records of drink driving is that the vast majority of detections are initiated by police activity. Random breath testing stations (RBTSs: commonly called 'booze buses') represent the major avenue through which drink-driving offences are detected. Therefore, major spikes in detections actually reflect major campaigns or 'blitzes'. On top of this, many of the community-based interventions, particularly those funded by the TAC are also accompanied by major police campaigns. Often, extra police time is paid for by the TAC to allow greater police numbers.

A further consideration to the natural limit of RBTSs is that the ability to process offenders is limited by the number of staff available. Each offender detected can occupy more than 40 minutes of the officer's time in regards to filling in paperwork, taking blood tests and organising appropriate detention or processing. Therefore, many of the peaks observed in the following data may have been far greater had there been unlimited police resources on hands. Police numbers in general are unavailable.

Similarly, policing practices may have also improved in regards to the targeted behaviour. For instance, police in Geelong have reported that strategic placement of RBTSs at major bridges in and out of Geelong has allowed comprehensive detection of drink drivers. Further, the use of additional patrol cars cruising back streets has also reportedly improved detection rates.

Therefore, the trends presented do not necessarily represent a true reflection of the number of drink drivers on the roads in the Geelong region and may simply indicate the maximum capacity of a given RBTS. Certainly, international evidence suggests that arrest data cover only 0.5 per cent of total self-reported rates of drunken driving (Perrine, et al., 1989).

Barwon Health Geelong Hospital Emergency Department data

Other data examined for this report were obtained from the Geelong hospital emergency department, as this data source was deemed to be more sensitive to the specific features of the Geelong region and community. Triage records were downloaded according to word searches of relevant databases. The data was of a secondary nature as it was primarily collected for other purposes than research into alcohol-related injury. Measures included in the data

pertained to patient demographics, location of hospital presentation by suburb, basic description of incidents, treatment and discharge details, and finally alcohol- and/or other drug-involvement as signified by in-record references to such drugs and by relevant ICD-10 coding. Although the data contained indications of whether alcohol was involved in each instance, substitute measures were still required in order to aggregate the data into specific classifications relevant to this project. These categories were determined through case-by-case examination of triage records dating July 1, 2005 to July 31, 2009.

A total of 146 cases were identified where alcohol had been identified in Traffic Accident related attendances at the ED. Given the relatively small pool of data, ED-data cannot be considered reliable enough to describe trends.

Analysis

The study was conducted in two stages. Firstly, general descriptive statistics were generated detailing the time of day (high-risk = 8pm-5:59am) and day of week of DUIs. DUI-rates by year were also presented in time-line graphs for the dates of the obtained data, and the data was further divided into subgroups denoted by blood alcohol concentration (BAC) levels of BAC-1, -2, and -3 (BAC ≤.01, BAC ≤.02, BAC ≤.03, respectively), and number of prior DUI-offences. Secondly, pre- to post-intervention effects were assessed using linear regression analysis. This analysis, however, was only performed on the police data, as the ED-sample was too small to determine any statistical effects.

While a time-series analysis of all of the data would have been ideal and probably more direct than regression analysis, a fundamental assumption of this technique is the presence of serial autocorrelation and data-stationarity. Durbin-Watson tests, however, indicated no significant autocorrelation in all of the data aggregates with the exception of the BAC -1 category which was still in the 'grey' zone between the upper and lower Durbin-Watson critical values (all cases d = 2.118 > $d_{u, 0.05}$ = 1.9015; recidivist cases d = 1.958 > $d_{u, 0.05}$ = 1.9015; high-risk hours cases d = 1.995 > $d_{u, 0.05}$ = 1.9015; BAC -1 d = 1.784 < $d_{u, 0.05}$ = 1.9015; BAC -2 d = 2.023 > $d_{u, 0.05}$ = 1.9015; BAC -3 d = 1.935 > $d_{u, 0.05}$ = 1.9015). Further, stationarity was unobtainable through differencing or log-transformations in all of the data-sets. For these reasons, a time-series approach was unfeasible. As a result of using linear regression analysis to assess pre- to post-intervention effects, a causal relationship could not easily be surmised between the implemented interventions and the frequency of DUIs. The analyses could determine, however, whether DUI-rates post-intervention were significantly different to the rates pre-intervention.

Results

Victoria Police Data

DUI-rates by time of day & day of week

The majority of DUI-incidents occurred on Thursday through Sundays (78.4 per cent, n = 7384), with most cases on any one day being recorded on Saturdays (25.8 per cent, n = 2429). Most offences were registered between the hours of 7pm and 5am (77.5 per cent, n = 7300) with 5809 (61.7 per cent) cases occurring within this time-frame Thursday through Sunday, and 1940 (20.6 per cent) incidents on Saturday within this time-frame.

DUI-rates by year

Figure 26 below demonstrates the frequency of DUI-rates between January 1999 and July 2009 with reference lines for each of the interventions implemented within this time-frame. A regression line (Figure 26) indicates a slight upward trend in the frequency of DUI-cases over time with a positive correlation of R^2 = .22. DUI-rates appear to have increased up until January 2002 after which the frequencies level off. Visually (Figure 27 and Figure 28), the interventions do not appear to precipitate dramatic or lasting declines in DUI-rates, though brief down-turns do follow some of the campaigns (e.g. Enforcement 1 and 2).

Regression Analysis

Linear regression analyses of the data were conducted to ascertain the practical influence of the implemented interventions (IVs) on DUI-rates (DV). IVs were represented by dummy variables coded 0 = pre-intervention, and 1 = post-intervention. The analysis was performed using SPSS Regression, and SPSS Frequencies was used for evaluation of assumptions.

To obtain enough cases for the regression analysis, the time-series was aggregated by month, and thus consisted of 127 data points through the time-frame of 1 August, 2001 to 31 July, 2009. An examination of Z-scores and box-plots revealed single outliers in the BAC 1, BAC 2 and High-risk Hrs categories. These were recoded to the second-most extreme value. Six outliers were detected in the BAC 3 category, but given the low monthly frequency of DUIs with BAC s between .20 and .30 (n = 127, m = 1.51), these were not altered.

Assumptions of linearity and homoscedasticity of residuals were met. As DUI-frequencies for BAC 2, BAC 3 and Recidivist were negatively skewed, logarithmic transformations of BAC 2 and Recidivist categories were successfully used to normalise its distribution. BAC 3, however, was not able to be normalised, and these results should be interpreted with caution.

The regression analyses generated significant results for all of the data categories with the exception of BAC 3 (see Table 10). Further, as indicated in Table 11, in the data aggregates for 'All DUI', 'BAC 1', and 'High-risk Hrs', three of the individual interventions ('Education 1', 'Enforcement 1', 'Enforcement 2') all indicated significant pre- to post-intervention differences. Of these interventions, however, 'Education 1' was the only one which was associated with a decline in DUI-rates over time. Different results were observed for the 'BAC 2'-category where the interventions 'Edu/Emotive', 'Education 1', 'Enforcement 2' and 'Operation Nightlife 1' produced significant pre- to post-intervention differences. Here, only 'Operation Nightlife 1' and 'Education 1' were associated with drops in DUI-rates. Lastly, 'Enforcement 2', 'Education 1', 'Enforcement 3' and 'Emotive' produced significant results in the 'Recidivist' category. Of these, 'Education 1', 'Enforcement 3', and 'Emotive' were associated with a drop in DUI-frequency.

Table 10 Regression results by data-category

	R^2	Adjusted R^2	F
All DUI	.62	.57	14.04*
BAC 1	.62	.58	14.44*
BAC 2	.40	.33	5.78*
BAC 3	.08	-.03	.76
High-risk Hrs	.59	.55	13.93*
Recidivist	.68	.64	18.42*

*Note. * $p < .001$; All df = 13, 126.*

Table 11 Beta-coefficients and t-scores by data-categories and interventions

| Intervention (IV)	All DUI β	All DUI t	BAC 1 β	BAC 1 t	BAC 2 B	BAC 2 t	BAC 3 β	BAC 3 t	High-risk hrs β	High-risk hrs t	Recidivist β	Recidivist t
1. Emotive	.18	.93	.31	1.60	-.16	-.81	.06	.30	.30	1.52	-.25	-2.04*
2. Enforcement 3	-.16	-.62	-.42	-1.61	.32	1.22	.00	.00	-.18	-.70	-.57	-3.60**
3. Education 2	-.11	-.23	-.19	-.40	.07	.15	.00	.00	-.11	-.22	-.31	-1.04
4. Edu/Emotive	.19	.93	-.16	-.76	.63	3.05**	.22	.95	.12	.56	.07	.54
5. Education1	-.93	-3.3**	-.76	-2.63**	-.58	-2.00*	-.27	-.83	-.77	-2.64**	-.63	-3.50**
6. Enforcement 1	.67	2.67**	.71	2.82**	.25	.96	.09	.30	.66	2.60*	.05	.32
7. Enforcement 2	.36	3.72***	.32	3.30**	.25	2.52*	.15	1.40	.30	3.07**	.22	3.51**
8. Just Think	.18	.54	.04	.10	.35	1.00	.41	1.05	.00	.00	.34	1.61
9. Op Nightlife 1	-.23	-.71	.20	.60	-.76	-2.30*	-.12	-.33	-.10	-.31	-.19	-.92
10. Op Nightlife 2	-.14	-1.40	-.12	-1.24	-.13	-1.30	.01	.04	-.13	-1.31	-.04	-.66
11. Op Razon	-.24	-.66	-.16	-.43	-.20	-.53	-.40	-.92	-.17	-.45	-.02	-.09
12. ID-Scanners	.10	.43	.25	1.10	-.27	-1.20	-.11	-.43	-.11	-.49	.13	.90

Note. * $p < .05$, ** $p < .01$, *** $p < .001$
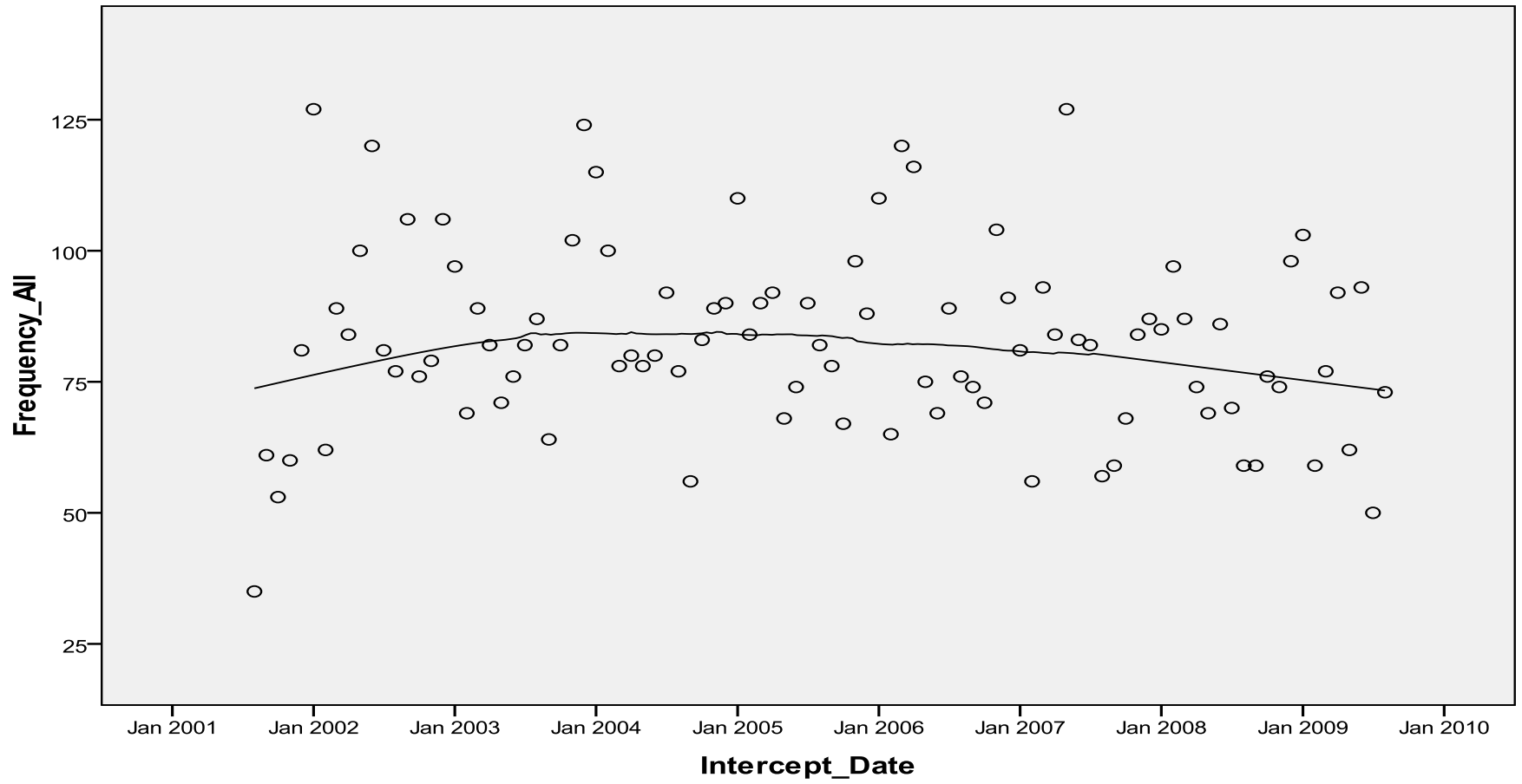
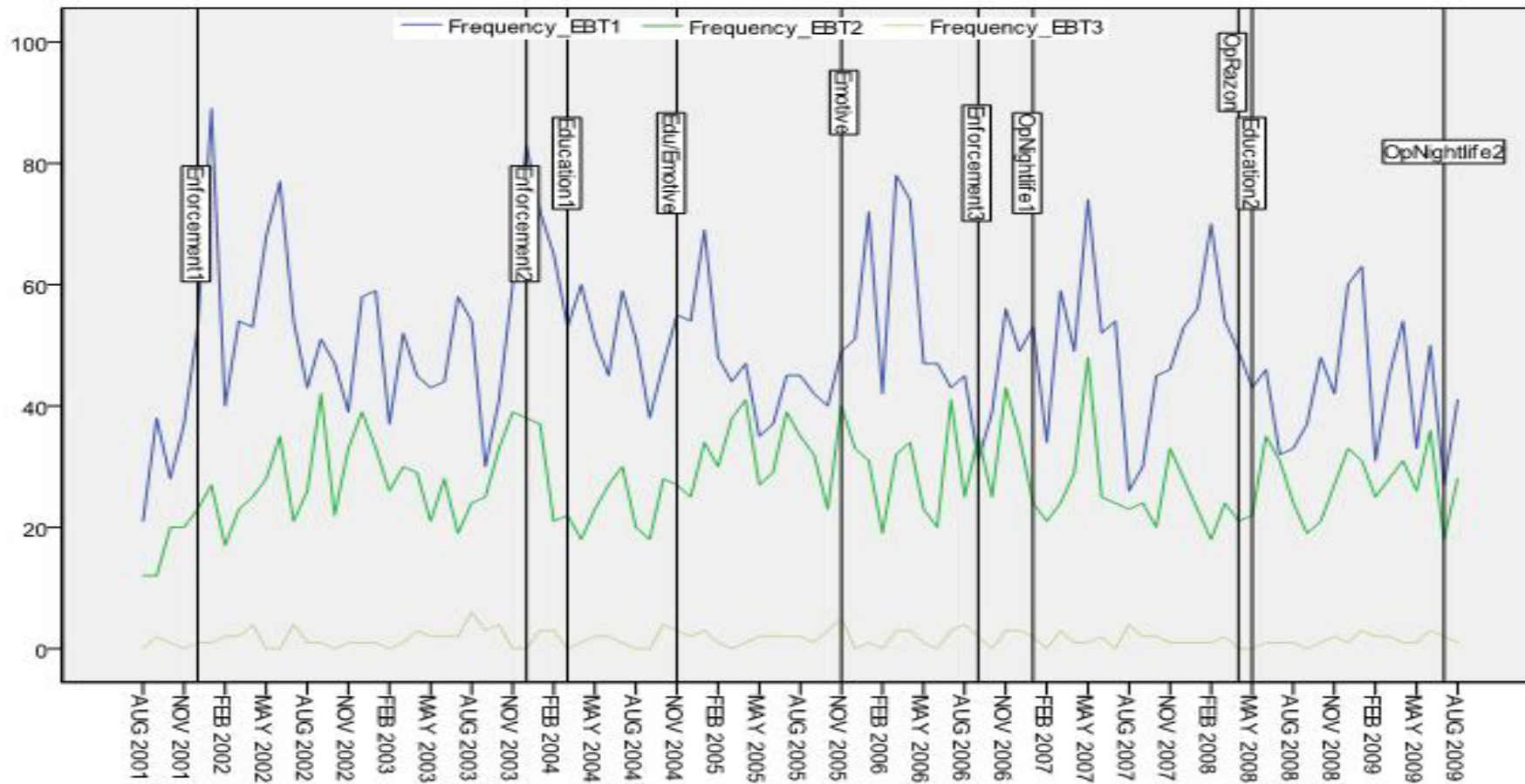**Figure 26 DUI-frequency by month with trend line**

Figure 27 DUI-frequency categories by month and year with TAC/Police interventions
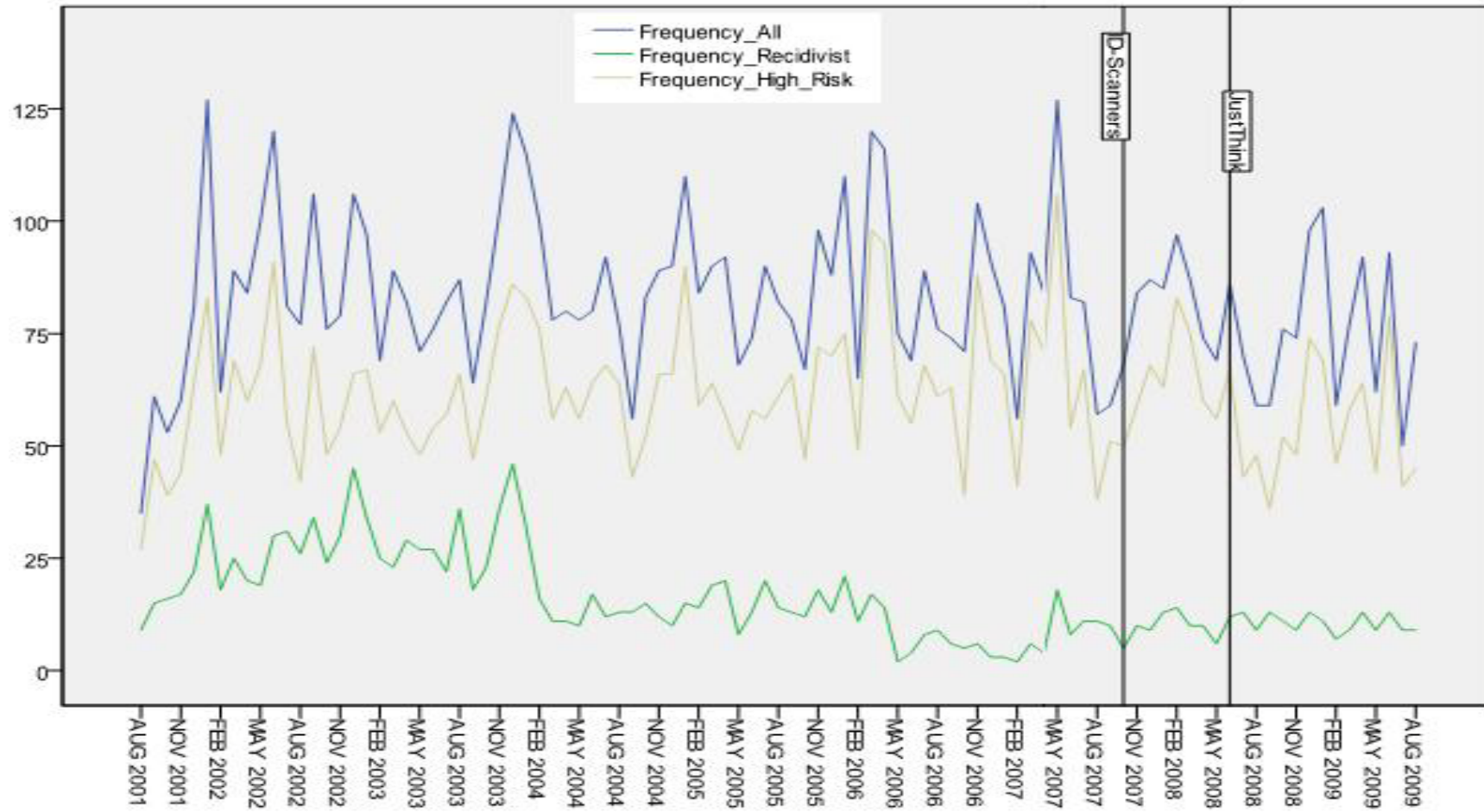
Figure 28 DUI-frequency categories by month and year with community intervention

Preliminary Breath Test results

In addition to Evidentiary Breath Tests data reported above, some information is available from Preliminary Breath Tests (PBTs). This information includes basic numbers on the number of people tested, those indicated for further testing, the gender of people tested, the number of people who refused at each site, and the suburb that the test was conducted in.

PBT tests can occur in the context of PBT stations ('booze buses'), or individual tests on drivers. A mean of 1.03 males and 0.3 females were identified for further testing per site. An average of 408 people was tested per site. Only 8 people refused to be tested over the data collection period; all were male. On average, 3.61 per 1,000 people tested were identified for further testing (StDev=5.2; Range: 0-71.4).

Figure 29 reports the number of 'positive' PBTs over time per 1000 tests. Trend analyses suggests a non-significant increase over time (R2=0.017, F=1.727, p=0.192), although a trend line shows that there has been a more recent decrease in the rate of positive tests per 1000 people tested.
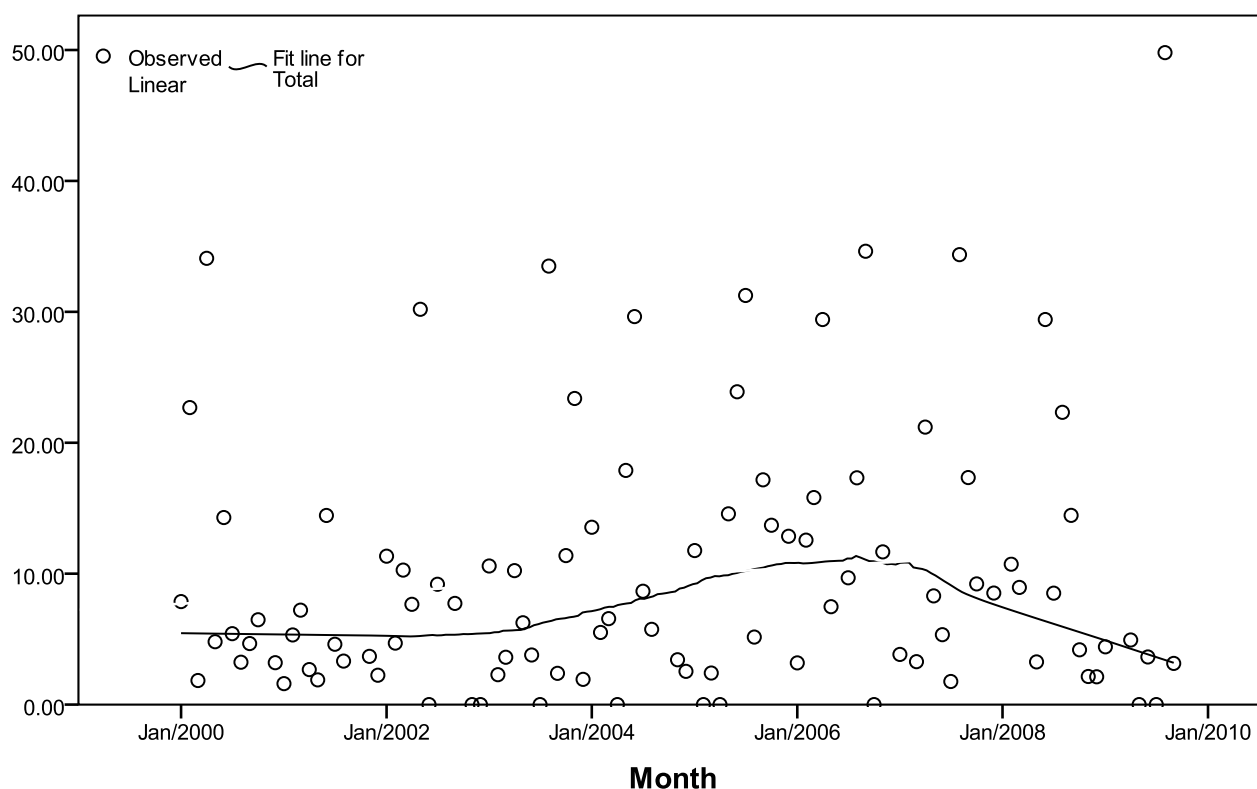
Figure 29 Failed breath tests per 1000 over time

Barwon Health Geelong Hospital Emergency Department data

There were 3934 triage presentations involving alcohol between July 1, 2005 and July 31, 2009. The age-range spanned from 10 to 95, with a mean age of 37, and a mode age of 20. The age-group 15-24 was the largest and comprised 30.1 per cent (n = 1185) of all cases. This was more than one third as much as the next largest age-group, 25-34 year-olds, which accounted for 18.9 per cent (n = 742) of the sample. Males were more than twice as likely to be involved in alcohol-related triage cases than were females, with 68.9 per cent (n = 2710) of triage presentations being male, and only 31.1 per cent (n = 1224) being female. As previously mentioned, 146 cases were identified where alcohol had been reported in Traffic Accident related attendances at the ED. Figure 30 reports the number of people attending alcohol-related traffic ED attendance frequency by half year. Figure 31 presents the same data for quarterly intervals.

Because of the smaller numbers involved in ED attendances, there are few meaningful analyses which can be conducted. As such, raw data is presented and demonstrates an apparent rise in the number of people attending the ED with traffic-related injuries and alcohol consumption. However, Figure 30 and Figure 31 demonstrate that the number of people attending ED for traffic accidents that also report alcohol use over the previous 5 years has increased. Where some of the increase may be related to an annual population increase of 1.5 per cent, overall ED attendances have increased at an average annual rate of 5.7 per cent, with 47,382 attendances in the 2008/9 financial year. Further, increased awareness of alcohol as a cause of harm may contribute to noted increases, although ED-staff are qualified health professionals who have been well aware of such associations for a long time.
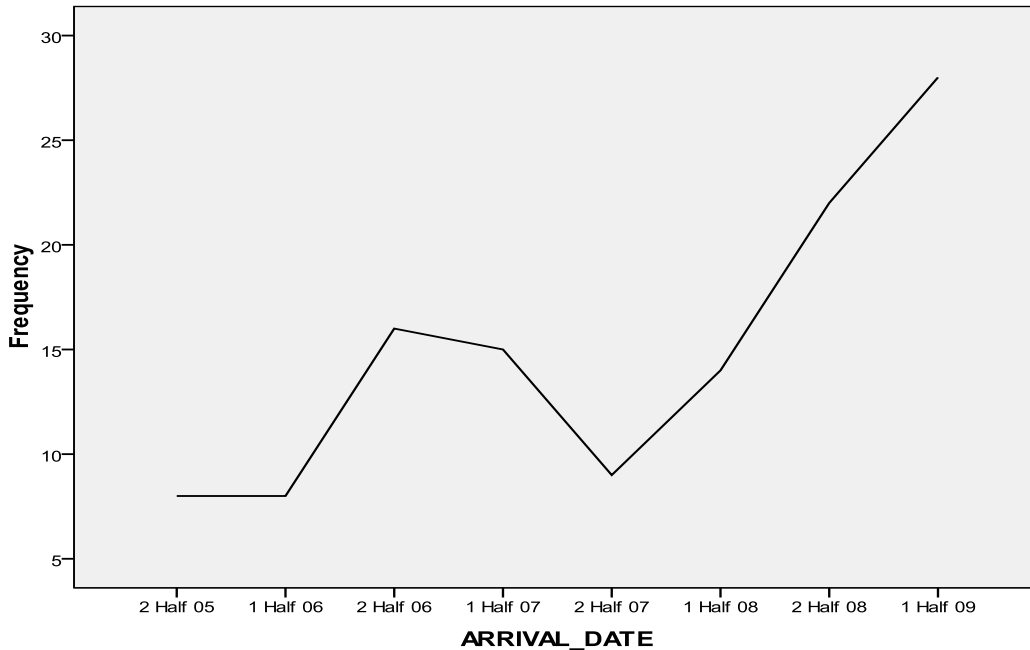

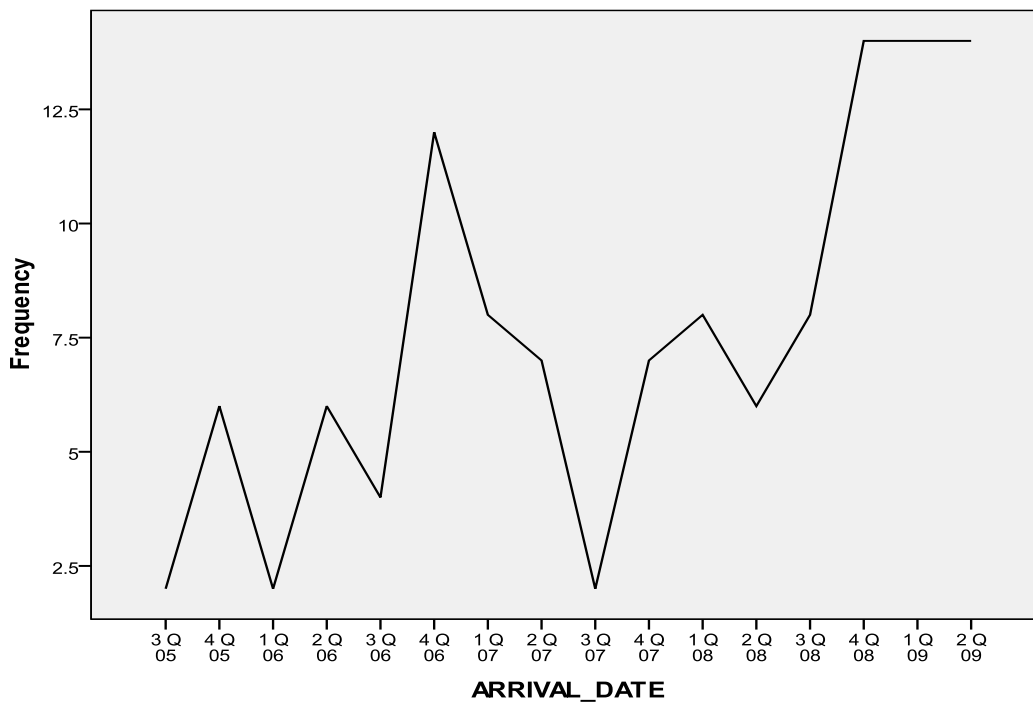**Figure 30 Alcohol-related traffic ED attendances frequency by half year**

Figure 31 Alcohol-related traffic ED attendances frequency by quarter year

Discussion

DUI-rates in Geelong over the past decade appear to have decreased incrementally since January 2002 despite the many seasonal peaks and troughs. While data from the Geelong hospital emergency department appears to suggest an upward trend, the numbers are too small to be confident that trends are real. Nonetheless, and as mentioned previously, the practice of estimating DUI-rates using police data, is an inherently difficult one when considering the fact that the presented frequency rates indicate police activity in terms of manpower and targeting rather than actual DUI-rates. That is, increases in DUI-stops are likely to be an artefact of increases in the number of police on the streets as well as their strategic approach during DUI-blitzes, which often occur concomitant with TAC drink-driving campaigns.

The findings reported above suggest that there is no discernible effect on the level of drunk driving from interventions that focus on licensed venues. At one level, this may be unsurprising, however, the strong links between licensed venues and drunk driving observed in the past suggests there may be have been some effect. Certainly, interventions which have proven records in dealing with alcohol-related harm in licensed venues, such as increasing the price of alcohol (Wagenaar, et al., 2009b) and reducing trading hours (Chikritzhs & Stockwell, 2006), have demonstrated measurable and sustained effects on drunk driving. Therefore, the other conclusion available is that the community-level interventions being studied are not effective. This would also be unsurprising, as the vast majority of interventions implemented at a community level fail to show significant effects, either in terms of drunkenness or violence (Graham, 2008; Graham & Homel, 2008). Similarly, other research has consistently found that there is a positive relationship between drunk driving and other crime (Brace, et al., 2009).

Of the two community interventions (Just Think and ID-scanners) included in the analysis, neither generated any significant effects on DUI-frequency rates across any of the categories. Like other awareness programs, Just Think has not been associated with any decreases in DUI-rates, although the campaign is not focussed on drunk driving per se. It is plausible that an intervention which improved self awareness of patrons might reduce drink driving levels, but these results demonstrate no discernible effect. Similarly, the implementation of ID-scanners in licensed venues also showed no secondary benefits in terms of drunk driving. These findings mirror those found for alcohol-related injury and alcohol-related assault in Geelong (Miller, et al., Under review-a, Under review-b).

In contrast to the community initiatives, regression analyses assessing the impact of the different police and TAC interventions on DUI-rates by category, show significant reductions for four of the interventions (namely the TAC's 'Emotive', 'Enforcement 3' and 'Education 1' media campaigns, and the Victoria Police intervention, 'Operation Nightlife 1'. Further, 'Emotive' and 'Enforcement 3' precipitated a statistically significant decrease in the recidivist drink drivers, whereas 'Education 1' was associated with decreases in all categories except those with the highest BAC levels (BAC3). While 'Operation Nightlife 1' precipitated a decrease in BAC 2 alone, this association is likely to be spurious as one would expect effects at all levels if the intervention actually affected drink-driving behaviour in the community.

The 'Education 1' campaign was a media commercial which showed common drinking-contexts – BBQs, work-drinks, friend's place – and emphasised the fact that low levels of alcohol can still affect driving performance and have serious consequences. This intervention is associated with drops in all of the categories with the exception of BAC 3, the most intoxicated drivers. The related decrease in cognitive function is likely to further inhibit any effect a media intervention may have on him or her.

In contrast to the 'Emotive' and 'Enforcement 3' initiatives which are relatively aggressive in terms of the conveyed message (i.e. 'the police will catch you' or 'someone will get hurt'), the 'Education 1' campaign is more broad in nature and relies on creating awareness and knowledge around the topic of drink-driving by displaying common settings in which alcohol is consumed prior to driving. In light of its generic approach, it is feasible that the 'Education 1' campaign could affect DUI-rates in the given categories.

Future Research

The findings above demonstrate that while available data can suggest some trends, they are highly flawed. These findings accord with previous research in Victoria, and particularly in regards to the need for improved access to data and the ability to link datasets (Brace, et al., 2009). Future research should include regular population surveys already in place with added DUI questions.

Conclusion

Of the twelve interventions examined for this report, four were associated with decreases in DUI-rates. 'Emotive' and 'Enforcement 3' were related to significant decreases in the recidivist category only, while 'Education 1' precipitated a drop in DUI-rates across all categories with the exceptions BAC 3. 'Operation Nightlife 1' was associated with a drop in the BAC 2 category alone. While these results may be intuitively reasonable given the content and strategies of the respective interventions, data limitations are noted.

Ambulance data

The final source of data for the current report comprises ambulance attendance records which provide a more sensitive measure of drug-related harm in the community than either hospital records or police records, although each one will capture slightly different populations (Dietze, et al., 1999). Ambulance data has consistently been found to be useful in identifying and under-reported health trends such as heroin overdoses. Ambulances are dispatched routinely throughout the Melbourne metropolitan area in response to calls received by the Intergraph © dispatch system. Ambulance officers are required to complete patient care records (PCRs) on the Victorian Ambulance Clinical Information System (VACIS) for every call that they attend, and provide care at the scene or during subsequent transport. Information contained in these PCRs includes call details, transport details, basic patient demographics and relevant clinical information.

Method

Two forms of ambulance record were accessed:

1. Computer Aided Dispatch (CAD) records
2. Victorian Ambulance Clinical Information System (VACIS) patient care records (PCRs)

Records from the two data sources were merged and relevant cases were categorised through the use of a set of keywords identified in collaboration between the research team and representatives of Ambulance Victoria. Keywords used in this search are identical to those used in the keyword search of hospital triage records.

Data was only available from mid 2008, when electronic data collection was commenced by Rural Ambulance Victoria (since becoming Ambulance Victoria). The first 6 months of data should be treated with some caution as data collection rollout was neither perfect nor instantaneous.

Unfortunately, the time period for which data is available occurs after the introduction of most interventions in Geelong to reduce alcohol-related harm. However, the data remains useful in identifying trends which have occurred in the past 2 years and also in terms of illustrating the relationship between police, ED and ambulance attendance trends.

Results

Frequencies and demographics

Overall, there were 1655 ambulance attendances involving alcohol between April 1, 2008 and June 30, 2010. The age-range spanned from 2 to 96 yrs old, with a mean age of 33, and a mode age of 20. The age-group 15-24 was the largest and comprised 25.3 per cent (n = 418) of all cases (see Figure 32). This was more than one third as much as the next largest age-group, 25-34 year-olds, which accounted for 17.6 per cent (n = 291) of the sample. Females were more likely to be involved in alcohol-related ambulance attendances than were males (58.8 per cent, n = 973, female and 40.41 per cent, (n = 669) male).
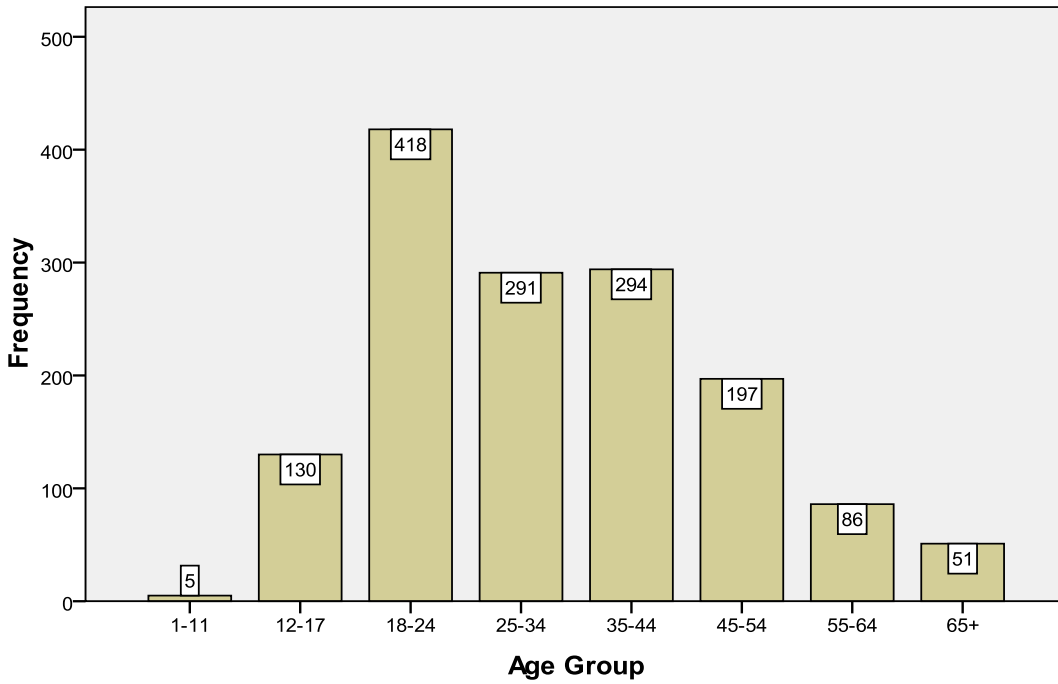
Figure 32 Ambulance attendees by Age Groups

Alcohol-related injuries by time of day & day of week

Most (42.3 per cent *n* = 705) alcohol-related incidents took place on the weekends. As indicated in Figure 33, Sunday was the day of the week with the highest rate of incidents, most of which occurred between the hours of 12am and 6am (see Figure 34). High alcohol hours account for approximately a third (30.5 per cent) of all alcohol-related cases.
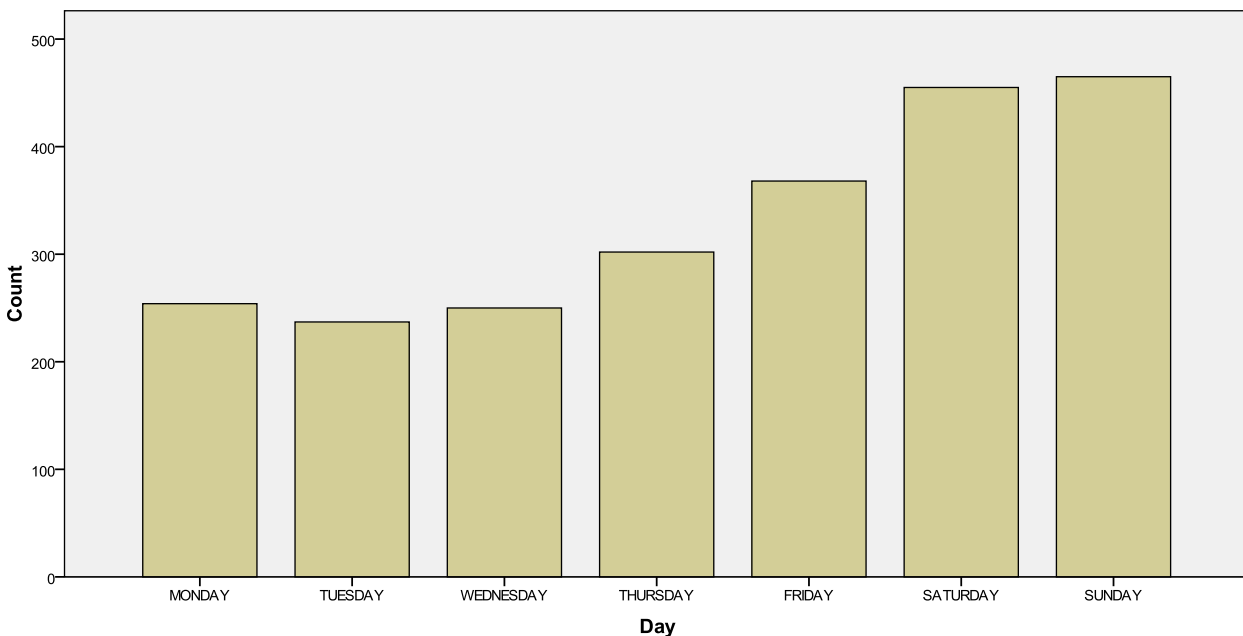
Figure 33 Frequency of alcohol-related ambulance attendances by day of week.
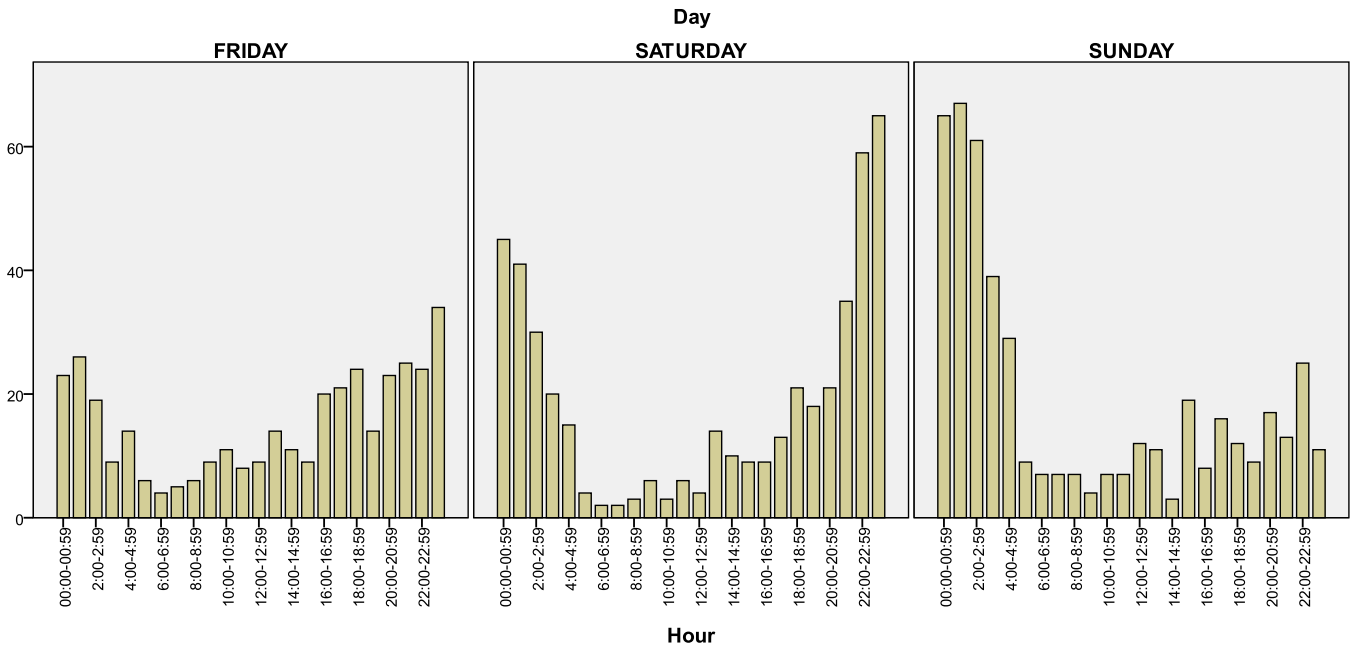
Figure 34 Frequency of alcohol-related injuries by hour and weekend day.

Figure 35 shows seasonal trends through monthly averages demonstrating an annual peak in May, followed by a drop to July. As with ED and Police data, there appears to be an obvious increasing trend due to events such as New Years Eve celebrations and annual holidays. Similarly, in common with ED and Police data, there is a clear trend of reduced numbers of alcohol-related injuries in the colder months (June-October).
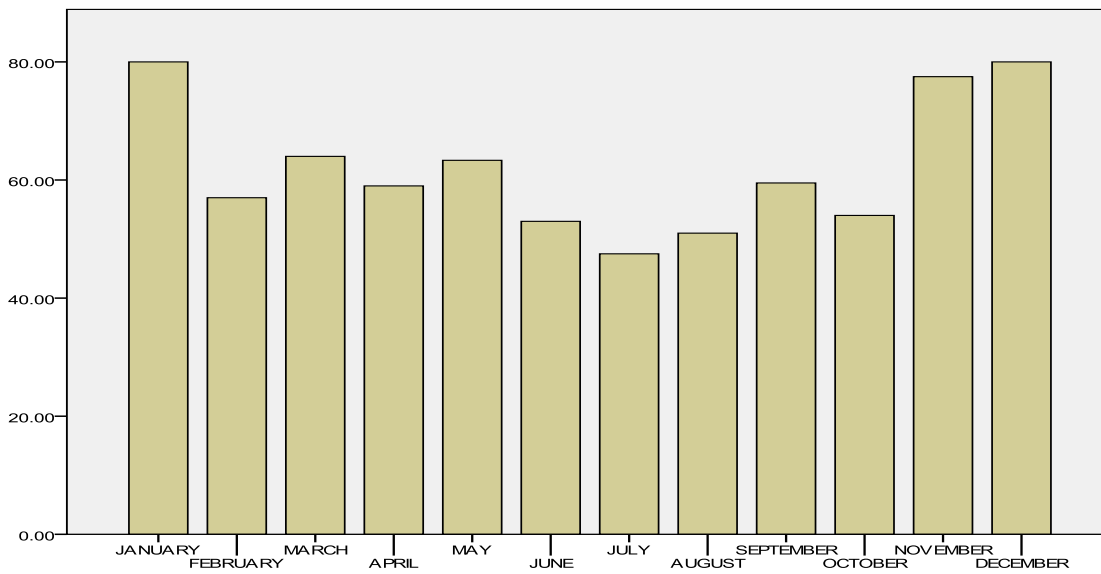
Figure 35 Mean Ambulance Attendances by month

Location

Table 12 reports the top 10 suburbs attended by ambulances. The most common suburbs visited reflect those seen in police statistics and highlight that while the largest number of cases comes from central Geelong, a substantial number also come from outlying areas.

Table 12 Frequency of attendance by Suburb

	Frequency	Percent
Geelong	346	14.8
Corio	271	11.6
Norlane	239	10.3
Belmont	122	5.2
Grovedale	111	4.8
Whittington	87	3.7
Geelong West	79	3.4
Torquay	74	3.2
Lorne	62	2.7
North Geelong	62	2.7

Alcohol-related injury rates over time

Figure 36 reports on alcohol-related ambulance attendances during high alcohol hours. While there is an apparent overall upward trend (R^2=0.017), there has been a steady decline in alcohol-related ambulance attendances since September 2009. It is likely that the peak observed in September 2009 reflect the traditional spike seen in relation to the Grand Final which occurred on the 26th Sept and saw 13 ambulance attendances on the Sunday – more than 3 times the average attendance (mean=3.42) for a Sunday.
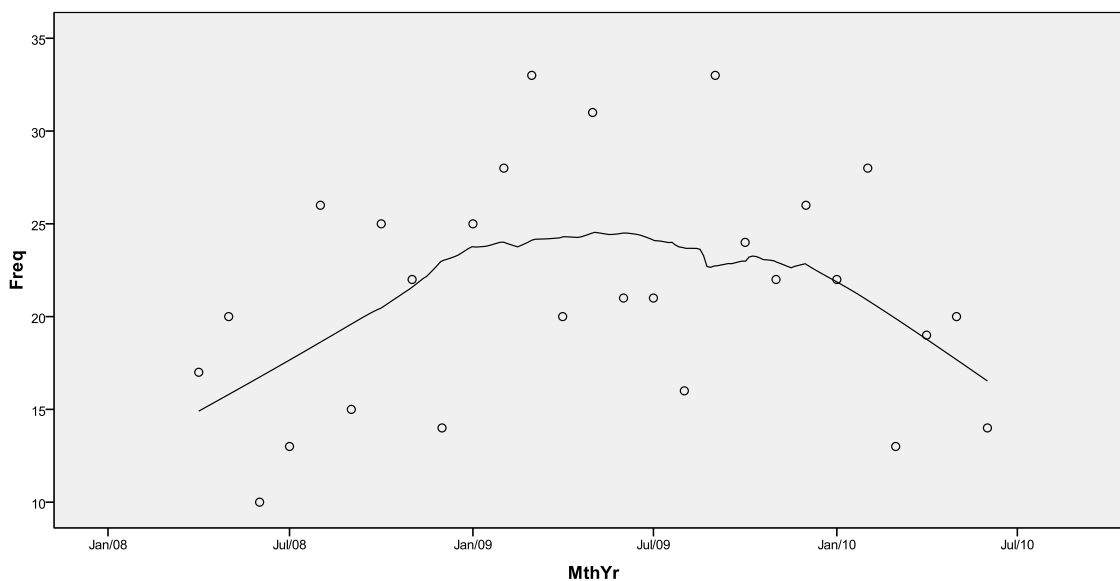
Figure 36 Monthly frequency of Alcohol-Related Ambulance Attendances during High Alcohol Hours over time.

Discussion

Ambulance attendance records presented in the above section are slightly more recent than the available Emergency Department (ED) and Police data. Overall the data shows an increasing trend over the past 3 years, although recent patterns suggest a decline in attendances during high alcohol hours. This data corresponds with Police data, but stands in contrast to ED data which shows continuing increases in alcohol and assault-related harm.

As with other secondary data, most alcohol-related ambulance attendances occur during Friday night and Saturday night. Similarly, the mean age of attendees is 34 years and the age group most commonly attended are 18-24 yr olds (25.3 per cent).

A very notable difference between ambulance data and police and ED data is the much higher attendance rate of females (58.8 per cent) in comparison to 31.1 per cent for ED attendance and 22 per cent for police assaults. This suggests that ambulance data is picking up a partially different group of people who are affected by alcohol-related harm in the community. This may be due to cultural trends such as there being a greater likelihood of an ambulance being called when a female is alcohol affected or hurt than a male. Similarly, it may be that women are more likely to call an ambulance for assistance, where men are more likely to find their own means of support. These findings deserve further investigation to establish whether the trends observed relate primarily to females or whether such trends apply for both genders. Similarly, it may be that specific interventions have affected females more than males. These questions will be the subject of further analyses.

Alcohol availability

Also emerging in Victoria over the past two decades has been a proliferation in the number of alcohol outlets. From 1991 to 2008, the annual number of liquor licenses held in Victoria has increased by 150 per cent, from 5,344 to 16,048 (see Figure 37).

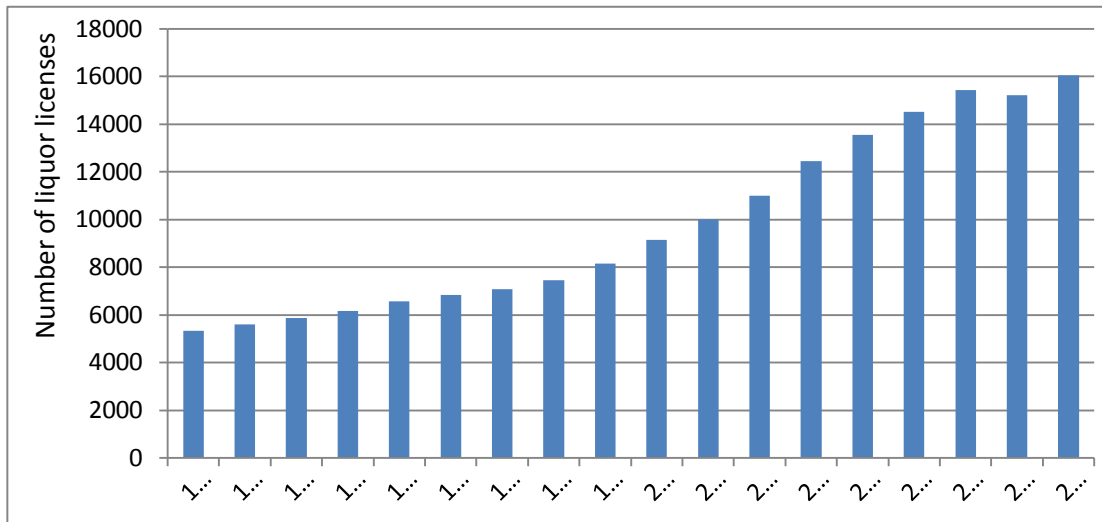**Figure 37 Total annual number of liquor licenses, Victoria, 1991 to 2008. (Source: Turning Point Alcohol and Drug Centre, unpublished).**

Within Geelong, the number of licensed venues has remained relatively stable over the past 5 years; reflecting recent Victorian trends (see Table 13). While the previous literature has suggested that there is a strong correlation with increasing numbers of licenses and increased alcohol-related harm (Livingston, 2008b), the reverse is not so clearly true. However, in the context of Geelong, it is very likely that there is simply a saturation of licensed venues beyond the market demand. Within the Geelong CBD, at least 3 late night licensed venues are closed at any time, and during the study period a number venues have closed due to insolvency, only to be purchased and re-opened by another licensee. Beyond that, it is also clear that there are a number of venues that have licenses which enable them to open long beyond the hours they currently trade. This saturation does create an undesirable situation where there is normally 2-3 venues which are struggling to maintain their profitability. Licensees often respond to such situations by dropping alcohol prices, RSA standards and staffing levels to compensate, creating a situation where patrons are likely to experience greater intoxication and subsequent harm. Through these mechanisms, the outlet density-harm ratio does not necessarily mean that when there is a flattening out in the number of licenses in a given area, there can be a continuing increase in harm levels.

Table 13 Licenses by category in Geelong (2004-2009)

| Geelong | YEAR as at 30/06 | | | | | NOW |
Licence Category	2004	2005	2006	2007	2008	12/03/2009
General Licence	31	31	31	30	28	29
On-premises Licence	77	78	81	81	80	83
Full Club Licence	5	5	5	5	5	5
Restricted Club Licence	7	7	7	7	6	5
Packaged Liquor Licence	5	6	5	6	6	6
Vigneron's Licence	0	0	0	0	0	0
Limited Licence	17	20	21	22	28	28
Total	**142**	**147**	**150**	**151**	**153**	**156**

Secondary data and conclusions

The data presented above provides a comprehensive picture of alcohol-related harm in the Geelong area over the past 10 years. Synthesizing a wide array of data sources as outlined in this report presents some challenges, but there are a number of clear trends which can be observed as well as a number of obvious knowledge gaps remaining due to the nature of the data collected. Certainly, viewing alcohol-related harm over a long period and from a variety of data sources allows a much greater understanding of how alcohol consumption and excessive use impacts on the community. Overall, the project has described the substantial level of harm experienced in the Geelong area in the past ten years.

At the most basic level of harm, there were 3934 triage presentations involving alcohol between July 1, 2005 and July 31, 2009 and 5064 assault incidents recorded by Victoria Police for the dates of 1 July, 2004 to 31 May, 2009. In addition, 9422 cases of drink-driving were recorded between 1 January, 1999 and 31 July, 2009. In the shorter period of April 1, 2008 and June 30, 2010, there were 1655 ambulance attendances involving alcohol.

Demographics

Gender

Overall, men were far more likely to experience alcohol-related harm than women, except for those being attended by ambulances. Males attending the ED were more than twice as likely to be involved in alcohol-related triage cases than were females, with 68.9 per cent (n = 2710) of triage presentations being male, and only 31.1 per cent (n = 1224) being female. Similarly, males were far more frequently involved in DUI cases than were females, with 80.7 per cent (n = 7601) of all cases being male. In contrast, females were more likely to be involved in alcohol-related ambulance attendances than were males (58.8 per cent, n = 973, female and 40.41 per cent, (n = 669) male). It is unclear why this discrepancy exists, but it is possibly due to cultural practices around calling an ambulance for women earlier than men and the cases attended may be less serious, though further research is required into this dynamic. Unfortunately, the data supplied on assaults via the Victoria Police LEAP database lacked sufficient detail to generate similar demographics. However, it is clear that in general, males experience far greater harm in relation to alcohol consumption than their female counterparts.

Age

Young adults overwhelmingly experience the greatest acute alcohol-related harm. The age-range of ED attendees spanned from 10 to 95, with a mean age of 37, and a mode age of 20; 15-24 year olds were the largest group and comprised 30.1 per cent (n = 1185) of all cases. This was more than one third as much as the next largest age-group, 25-34 year-olds, which accounted for 18.9 per cent (n = 742) of the sample. Similarly, 25.3 per cent (n = 418) of all ambulance attendances were in the 15-24 age-group, followed by 25-34 year-olds, who accounted for 17.6 per cent (n = 291) of the sample. The age-range spanned from 2 to 96 yrs old, with a mean age of 33, and a mode age of 20. The 18-27 year-old age group were also responsible for 41.3 per cent (n = 3894) of drink-driving offences. Like other data sets, the age-range spanned from 12 to 98 with a mean age of 33, and a mode age of 20.

Time dispersion of alcohol-related harm

Time of day

The vast majority of alcohol-related harm occurs in the early hours of Saturday and Sunday morning. Most (58.5 per cent n = 2302) of alcohol-related presentations at the ED department took place on the weekends and Sunday had the highest rate of incidents (24.5 per cent; n = 965), most of which (55 per cent; n = 529) occurred between the hours of 12am and 6am. Similarly, most (42.3 per cent n = 705) of alcohol-related ambulance attendances took place on the weekends and high alcohol hours accounted for around a third (30.5 per cent) of all alcohol-related attendances. The highest frequency of assaults reported by Victoria Police occurred during the hours of midnight and 1:00am, with

assault rates remaining relatively high until 4:00am. Sunday was the day of the week that had the most assaults recorded.

Month of year

There are also clear seasonal trends for alcohol-related harm in Geelong. All of the relevant indicators show an annual peak in January, followed by a drop in February. Events such as New Years Eve celebrations, and annual holidays in the Geelong area contribute to this annual trend. Further, there is a clear trend of reduced numbers of alcohol-related injuries in the colder months (May-October).

Geographical dispersion of alcohol-related harm

An enlightening aspect of the data is that alcohol-related harm is spread across the Geelong and Surf Coast. While the CBD accounted for most of the assaults in the Geelong-Surf Coast region (n=1309, 25.8 per cent), it was closely followed by areas such as Corio (n=1209, 23.9 per cent) and Whittington (n=560). Assaults most commonly occurred in private residence (n=1839, 36.3) followed by street (n=1428, 28.2 per cent), retail premises (n=293, 5.8 per cent) and then licensed premises (n=271, 5.4 per cent). Similarly, central Geelong accounted for most ambulance attendances (15 per cent), followed by Corio, Norlane and Belmont. Its geographical dispersion of alcohol-related harm suggests that interventions targeting the reduction of such harm need to focus more broadly than on just the city centre.

Trends over time

Long-term trends over time indicate a steady increase in alcohol-related harm in Geelong, although a number of indicators suggest recent downturns. The main indicator of alcohol-related harm in the community is ultimately people attending hospital. While other indicators – such as assault and ambulance data – are valuable the number of people attending the emergency department (ED) must be seen as the ultimate indicator of trends over time.

Emergency department triage cases

Geelong Hospital ED data reported that the frequency of alcohol-related incidents as represented by triage records and ICD-10 codes has steadily increased over the past 10 years, with a more marked rate of increase since mid-2008. Regression lines indicate an upward trend in the frequency of incidents over time with positive correlations of R^2 = .70 and .44 for triage data and ICD-10 data respectively. Further, none of the interventions implemented in Geelong coincide significantly with any sustained decrease in alcohol-related injury rates. It was also noted that the Just Think intervention was associated with a significant increase in assaults and alcohol-related injury, although causal attributions cannot be made from the available data. Importantly, the findings presented here tend to reflect statewide trends pre 2008, although data available for this project is more recent than those available at a state level. The most recent data available, up to February 2010, shows continued increases although comprehensive analysis is yet to be completed.

Police assault records

The frequency of assaults during high alcohol hours, taken from Geelong police data also shows an increasing trend over time, although assaults during high alcohol-related times seem to have shown a levelling off. This may reflect increased police numbers and innovative policing techniques being used within the Geelong CBD, although none of the interventions appear to be directly related. In addition, policing tactics regarding the assault on the behaviour changed in 2009, with the introduction of substantive fines for antisocial behaviour which may mean that the number of assaults reported will drop while the number of fines given out will increase.

Police property damage records

Overall, alcohol does not appear plays a major role in property damage in Geelong, and while property damage offences increased up until mid-2007, they have levelled off since then. Although some offences occur within central Geelong, it is clear that the majority come from suburbs such as Corio, Norlane/North Shore and Whittington – all of which score high on disadvantage. It is therefore logical to assume that interventions focussed on licensed venues and alcohol would have little effect on property damage rate in Geelong, an assumption which is borne out in the analyses.

Drink-driving offences

DUI-rates in Geelong over the past decade appear to have decreased incrementally since January 2002 despite the many seasonal peaks and troughs. Similarly, the proportion of people returning positive alcohol tests in comparison to those who are subjected to Preliminary Breath Tests, while showing an overall increase, has shown a consistent decrease since January 2007. While data from the Geelong hospital emergency department appears to suggest an upward trend, the numbers are too small to be confident that trends are real. There does not appear to be any relationship between any of the community level interventions and reductions in drink-driving. However, significant reductions were noted for four of the Traffic Accident Commission (TAC) interventions ('Emotive', 'Enforcement 3' and 'Education 1' media campaigns, and the Victoria Police intervention, 'Operation Nightlife 1'. Further, 'Emotive' and 'Enforcement 3' precipitated a statistically significant decrease in the recidivist drink drivers, whereas 'Education 1' was associated with decreases in all categories except those with the highest BAC levels (BAC3). These findings support the continued efforts of such interventions, particularly when they are run concurrently with increased policing levels.

Ambulance attendance records

Ambulance attendance records presented in the above section are slightly more recent than the available Emergency Department (ED) and Police data. Unfortunately, electronic data has only been collected since 2008. Overall, the data shows an increasing trend over the past 3 years, although recent patterns suggest a decline in attendances during high alcohol hours. This data corresponds with Police data, but stands in contrast to ED data which shows continuing increases in alcohol and assault-related harm. The differences between ambulance and ED data may be related to the different gender mix of patients and it is possible that because ambulances are called for lower level incidents, which appeared to involve more females, there have been changes in relation to this type of alcohol-related harm. On the other hand, as ED attendances represent the most serious events, there appears to be little change in the upward trend of such events.

Alcohol availability

While the number of licenses available in the Geelong region increased steadily over the past 20 years, the last five years has seen a levelling off of the number of licences overall.

Data gaps and limitations

Establishing the actual prevalence of alcohol-related harm is difficult and data needs to be interpreted with caution. Almost all data presented and discussed in this report is secondary data, or data that is collected by or on behalf of governments for administrative purposes. Such data is useful for its population coverage, and secondary use is cost effective. However, limitations need to be acknowledged.

Definitional problems

There are a number of problems (Chikritzhs, et al., 1999) with how alcohol-related incidents are defined in the datasets :

• The definition of an alcohol-related incident varies

• Little information about the drinking context

• Little information about interactions between victims/perpetrators

Under-reporting

A number of datasets are known to underreport the prevalence of alcohol-related incidents. Emergency Department data ultimately only measure the details that medical or administrative staff noted. While keyword searching of relevant text is likely to be more reliable than the use of a limited number of ICD 10 (International Classification of Diseases) codes, alcohol involvement continues to be likely to be under reported. Further, there is currently no way to capture individuals who choose to attend GP clinics with alcohol-related consequences.

Similarly, physical assaults not serious enough to warrant ambulance, hospital or police involvement will not be represented in these datasets. Also, there is often a difficult distinction between the victim and an offender and many intoxicated altercations are to some degree consensual.

Likewise, a proportion of Police data is always dependent on police activity and changes in policing practice. For example, the recent legislation allowing the use of fines for anti-social behaviour will likely substantially reduce the number of reported assaults. It may be that other forms of data, such as call-out data for police, if available, could provide more reliable data on police activity in regards to alcohol, but the reality remains that most events are unlikely to be reported to police.

Finally, sexual assault and domestic violence continues to be substantially unreported and is very difficult to track through the use of secondary data sources. For example, the 2005 national Personal Safety Survey found that only 19 per cent of all women who had experienced sexual assault, and 35 per cent of women who had experienced physical violence, by a male perpetrator, since the age of 15 years, had reported the incident/s to police (Australian Bureau of Statistics, 2006). Further, the involvement of alcohol in sexual assault further impacts reporting practices and victims who had not used alcohol or other drugs around the time of the assault were more likely to see the offender charged (22.6 per cent) than victims who had used substances (9.2 per cent) (Heenan & Murray, 2008).

Therefore, the data reported in this study does require critical reflection about what may be missing as well as what might be over reported. Despite this, many of the inherent flaws are likely to remain relatively constant. As such, using secondary data to demonstrate trends over time, while not perfect, does give a good understanding of alcohol-related harm in the community.

Conclusions

The available secondary data on alcohol related harm in Geelong over the past 10 years has demonstrated that there is a substantial cost in terms of social and health related issues. A minimum of 10,000 people have been seriously affected in the past 10 years and this figure is likely to be a massive underrepresentation. It is also clear that the majority of people experiencing this harm come from the 15-24 age group and that males are generally over-represented. It is also clear that not all harm occurs within the central business district and that it is likely that increased activity around entertainment districts can push alcohol-related harm into the suburbs. This is further exacerbated by the change to increasingly cheap liquor being available through supermarkets and discount bottle shops where licensed venues, on the other hand, are required to ensure patron safety and sobriety which necessarily increases drinks prices.

The data analysed in this report shows that alcohol-related harm in Geelong region has increased over time, although a number of indicators suggest this trend may be slowing or even reversing. However, Emergency Department data, acting as 'the bottom line' continues to show substantial increases up until February 2010. It is also clear that none of

the interventions implemented at the community level appear to have any significant effect on their own. However, it is possible that some of the reductions noted in police assault and ambulance attendance data might be occurring as a result of combined community and police interventions. Another positive finding is that drink-driving overall in Geelong is clearly declining, probably related to the implementation of combined awareness and policing strategies. This combination may hold promise for future interventions around alcohol consumption in general across the community.

Summary and conclusion

Alcohol-related harm is a complex problem that requires a multifaceted and long term primary prevention approach. The data presented in this report highlight the clear social and health imperatives to reduce overall alcohol consumption and better manage environments where alcohol is consumed.

Research evidence

The literature reviewed demonstrated that there is a range of interventions which can be implemented at national, state, and local levels. At a national level, the most effective policy response to alcohol-related harm include increases in price through taxation on alcoholic beverages and/or a standard minimum price. Raising and enforcing the minimum level purchase age of alcohol has also been found effective in reducing overall alcohol-related harm and alcohol-related violence. Interventions that reduce alcohol advertising also appear to be effective, as are interventions that reduce licensed outlet density and licensed business opening hours.

The most effective community-level intervention strategy appears to be community action projects such as STAD. A clear evidence base also exists for targeted police interventions such as the Alcohol Linking Program. These initiatives reduced alcohol-related aggression and violence in the night-life, and were also highly conducive to positive fundamental change within the community as well as productive cooperation between various community organisations and government agencies. Vital elements of this intervention were the 10-year time frame and the central co-ordination of the project.

The evidence base remains exceedingly weak in comparison to other areas such as the treatment or prevention of alcohol disorders and requires a co-ordinated research agenda. Similarly, while some promising interventions are currently in place, few, if any, are coordinated. Interventions and research need to be conceptualised and funded over the long-term, rather than looking for short-term fixes. While there have been many efforts to contain and diminish alcohol-related harm, few have been evaluated and even fewer have been found effective. This is indicative of the weak and inconclusive quality of the available evidence which is often due to the complexity of the relevant variable relationships involved and the inherent difficulty of conducting sound scientific investigation with community-level interventions.

Secondary data

The available secondary data on alcohol related harm in Geelong over the past 10 years has demonstrated that there is a substantial cost in terms of social and health related issues. A minimum of 10,000 people have been seriously affected in the past ten years and this figure is likely to be a massive underrepresentation. It is also clear that the majority of people experiencing this harm come from the 15-24 age group and that males are generally over-represented.

The data analysed in this report shows that alcohol-related harm in Geelong region has increased over time, although a number of indicators suggest this trend may be decreasing. However, Emergency Department data, acting as 'the bottom line' continues to show substantial increases up until February 2010. It is also clear that none of the interventions implemented at the community level appear to have any significant effect on their own. Given these interventions focus primarily on late-night venues, these findings suggest that broader solutions might be indicated. Unfortunately, current data sources fail to systematically record where people had been drinking before attending the ED, or being involved in incidents reported to Police. Although many of the incidents seen at the Emergency Department could also have arisen from domestic assaults, streets fights or private parties, previous and current research has consistently demonstrated that a proportion are connected to licensed venues and it could be assumed that any intervention which substantially showed a reduction in alcohol-related harm in licensed venues would result in a reduction in ED attendances. On the other hand, some interventions may also displace harm from within licensed venues to street or domestic settings. Regardless, all incidents represent a failure of the current system of governance to adequately manage alcohol's effects on aggression. On the other hand, it is possible that some of the reductions noted in police assault and ambulance attendance data might be occurring as a result of combined community and

police interventions. Another positive finding is that drink-driving overall in Geelong is clearly declining - probably related to the implementation of combined awareness and policing strategies. This combination may hold promise for future interventions around alcohol consumption in general across the community.

Summary

National, state and local communities experience substantial alcohol-related harm. There is clear need for a wide range of interventions to address the many different types of harm as well as dealing with the many contexts in which alcohol-related harm occurs, whether they be street violence, chronic health disorders or domestic abuse. From the above review and data report it is clear that there are many innovative and effective strategies which can be used to reduce alcohol-related harm. Unfortunately, the most effective of those strategies need to occur at a population level and are likely to be unpopular with governments and voters. On the other hand, local interventions in their current form seldom show strong effects, although there remains a dearth of methodologically satisfactory research to track the effect of such interventions over time. Although the data presented for the Geelong region over the past 10 years suggests increasing harm across the community, there have been no interventions which target alcohol use per se and there are some indications of possible effects with a combination of strategies. Understanding how such strategies might work together should be a top priority for government and research institutions and the development of effective community-based models, such as the Alcohol Linking Program should be of the highest priority.

Gaps in the evidence

There remain substantial gaps in the evidence base in terms of the cause of alcohol-related harm and effective interventions. The most glaring gaps in Victorian evidence are in relation to alcohol consumption, timely access to police data, and details in relation to where problem drinking is occurring (such as is collected by the New South Wales Police Alcohol Linking Program).

In order to expand our knowledge of effective interventions, access to reliable data on alcohol consumption is required. Consumption data is critical for assessing changes to alcohol policies at the local, state and national levels. For example, the tax applied to ready to drink (RTD) beverages in 2008 in Australia was fiercely contested politically and publicly for almost twelve months before some reliable evidence as to its effects on consumption was available. Even so, this evidence was limited to sales from take-away liquor outlets and reflected trends in only a portion of the market. Detailed, timely and reliable sales data could have been used to produce timely estimates of the impacts of this tax on overall consumption, as well as any substitution effects between products or between on- and off-premise consumption.

Another substantial gap in the evidence is research into the role of the media, including their editorial policies and the moral panics they may create. There also remains a lack of evidence around how advertising, price and access affect violence. Finally, the evidence presented above demonstrates the value of collating secondary data for local areas. The collection and public reporting of such information for other areas would provide valuable feedback for communities struggling to determine what works in their local context.

Because evaluations are not yet conclusive enough to warrant a commitment to any single strategy, policies should be implemented using a problem-solving approach in which many tactics are tested, evaluated, and refined. This approach requires sustained, integrated efforts.

Recommendations

On the basis of the data derived from Geelong and the available research literature, it is recommended that:

1. A model of community alcohol responses be developed

It is clear that the ad-hoc introduction of interventions focussing on licensed venues has not reduced alcohol-related cases attending the Geelong Hospital Emergency Department. In light of this, and the evidence from previous research, it is recommended that a community alcohol intervention model be developed which is ideally introduced at a governmental level, incorporating major stakeholder organisations such as Police, local councils, Licensing bodies and other government and non-government organisations. The focus of the model should be to address whole-of-community alcohol consumption and the model needs to apportion appropriate responsibility at all venues that sell alcohol. In particular, the off-license sale of alcohol should be addressed and venues such as bottle shops and supermarkets should pay levies which reflect the harm they cause in the community.

This model should act as a model of best practice for communities, proposing structures for funding, staffing, interventions and time frames. Importantly, it should document the effects communities can expect to see from different interventions over time, as well as explaining any possible benefits from adding interventions. A vital element is the benchmarking and ongoing monitoring of major trends in each community, with guaranteed timely feedback to all community stakeholders.

The evidence available recommends a long-term, whole of community approach akin to the Preventing Alcohol Trauma Community Trial in the USA. The Preventing Alcohol Trauma Community Trial in the USA consisted of five mutually reinforcing components: 1) Community Mobilisation Component to develop community organisation and support, 2) Responsible Beverage Service Component, 3) Drinking and Driving Component to increase local DWI enforcement efficiency and to increase the actual and perceived risk that drinking drivers would be detected, 4) Underage Drinking Component to reduce retail availability of alcohol to minors, and (5) Alcohol Access Component to use local zoning powers and other municipal controls of outlet number and density to reduce the availability of alcohol.

It is recommended that a similar program be developed in collaboration with the Victorian government, with culturally and legally specific elements that include other issues such as transport plans and data sharing protocols. In addition, it is recommended that this program utilise existing Liquor Accord frameworks with changes to the legal status and membership of Accords, as well as development work on Accord being made license type (e.g. late night venues or bottle shops being separate Accords) and whether mandatory membership is feasible.This system will allow flexible, responsive and community-based responses to alcohol-related harm.

2. Improved data collection and access be prioritised

The lack of access to data regarding consumption of alcohol and its related harm in the community in most states remains a substantial, but easily corrected gap in the knowledge base. Two major elements: 1) timely and universal access to relevant data sources across Victoria, and 2) targeted information regarding the sources of alcohol-related harm in the community.

2.1. Timely and universal access to relevant data sources across Victoria

It is currently extremely difficult and expensive to access crime statistics in a timely fashion in Victoria and communities are unable to make informed decisions about how to identify and address the crime issues they face. This is particularly problematic in high visibility issues such as alcohol-related violence. New South Wales currently operates the Bureau of Crime Statistics and Research's (BOCSAR) as a statistical and research agency within the Department of Justice & Attorney General. Similarly, South Australia operates its Office of Crime Statistics & Research (OCSAR) within the Attorney General's Department in 1978 and is responsible for research into and the monitoring of crime trends and the criminal justice system within the state. BOCSAR was particularly prominent recently with the

release of a report into the effects of restricting trading hours of licensed premises in Newcastle (Jones, et al., 2009), demonstrating the worth of having publicly available and independent analysis of crime statistics inform public policy and interventions. It is recommended that Victoria adopt a similar model for the independent collection and dissemination of crime statistics.

2.2 Collection of systematic targeted information on sources of alcohol-related harm

Similarly, the uniform adoption of mandatorily collected 'last drinks' from police and EDs has been demonstrated in the literature as one of the most effective methods for dealing with alcohol-related harm. The alcohol Linking project in NSW demonstrated a very significant reduction in harm associated with licensed venues through the systematic collection of basic information about where an individual arrested for an alcohol-related offence purchased their last drinks (Wiggers, et al., 2004). A system such as this must be mandatory for police to record as voluntary schemes have showed little worth. Further, collecting this data from patients attending the Emergency Department in Cardiff, Wales was found to be associated with a reduction of up to 40 per cent of violence-related offence attending the ED (Shepherd, 2007). Both interventions involved subsequent intervention with venues identified with increased harm in the community, and while unpopular with licensees, are seen as an equitable way of identifying the sources of alcohol-related harm in the community. This is particularly relevant for the recent trend to pre-drinking and identifying where patients are accessing alcohol before attending licensed venues. It is recommended that such a system be trialled in a number of Victorian cities.

3. Explore alternate sustainable models of governing the night-time economy

The evidence has shown repeatedly that many police-based interventions, while successful in the short term, fail due to changing priorities and resource issues. This is not a reflection on current police members, rather an issue of resourcing across the state. In the current context of virtually unrestricted trading hours, maintaining adequate surveillance of night time entertainment districts using police alone appears ineffective in the long term. It is recommended that alternate governance models, which include the use of alternative custodians, such as Protective Service Officers be explored. Such a model should come from statutory bodies and not be out-sourced to private security companies.

Funding for such a model could be supplied through the application of harm levies, as recently imposed by the City of San Francisco, whereby sellers of alcohol pay additional levies to cover the public cost of their profit-making business. Such a model would ideally include take-away liquor retailers who are currently free from cost of the alcohol they supply.

4. Models of transportation research and intervention trials

The data presented in the report highlights the amount of alcohol-related violence which is occurring outside licensed venues. Previous (Homel, et al., 2004) and on-going (Miller, et al., under review) research has identified transport out of night time entertainment districts as a major factor in alcohol-related harm. Lack of transport can contribute to drink-driving, the injury of intoxicated pedestrians and increased violence through people being on the streets long after they wish to be there, either at taxi ranks or when people are walking home. Lack of adequate transport is also likely to contribute to property damage rates. Current models fail to adequately meet transport needs, but there is no information on how big the problem is or what interventions are likely to be effective. It is recommended that a program of research be conducted around taxi and public transport systems for night-time entertainment districts, emphasising the need for different solutions in larger cities and regional areas, both in terms of transport costs and cultures relating to public transport.

5. Stricter marketing codes overseen by an independent body

The review highlighted the importance of marketing of alcohol as a major influence on popular culture which has substantial effects on alcohol consumption and co-occurring violence and harm more generally. The evidence is also clear regarding the failure of current voluntary codes and a mandatory code of marketing conduct should be enacted, overseen by an independent body, free of advertising or liquor industry representation.

In light of this, it is recommended that stricter marketing codes for alcohol in all forms of media be introduced, to be overseen by an independent governing body funded through a specific advertising levy.

6. Specific formulations to reduce alcohol outlet density and trading hours be developed and implemented

The empirical support for an inverse correlation between outlet opening hours, and alcohol-related violence is clear. A comprehensive formula for the best model of trading hours in regards to public safety and health should be developed and implemented. While the evidence to date is clear about effectiveness, the information available has been collected on an ad-hoc basis where policies have been implanted on the basis of need when other policies have generally failed. Rigorous trials of different formulations of trading hour regulations would provide much-needed data about which combination of trading hours restrictions would be most effective at reducing harm, while ensuring liquor retailers are minimally harmed. It is recommended that such policy trials and research be implemented within Victoria.

Similarly, further information is required about the optimum number and type of outlets selling alcohol for different communities and how this can be best addressed through policy mechanisms. It is recommended that a program of research be undertaken in collaboration with government to explore both license limiting legislation, but also license buy-back schemes where there are an excessive number of licenses in communities which often leads to poor service practises and worsening consequences for the community.

7. A sophisticated model of pricing controls should be implemented

Excise taxation and minimum prices on alcohol products are the most successful alcohol policy in terms of cost-effectiveness, reductions in level of consumption, and overall social benefit. A model which considers a combination of pricing measures should be implemented. This model should include a graduated volumetric tax which increases proportionally with the volume of alcohol per beverage. An additional harm levy should be further explored for local communities to deal with specific problems.

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Appendix 1 – Drink Driving Interventions

May 2008 - Phase 6 - Education - if you think you're over the limit you probably are

Levels

Open on two guys in a bar ordering their next beer. The voiceover then talks about standard drinks and the other factors that can affect your BAC level such as physical size, tiredness and food consumption. As the voiceover talks the barmaid adds or subtracts beer from the guys' glasses depending on whether the factor discussed has a positive or negative effect on their BAC.

September 2006 – Phase 5 - ENFORCEMENT 3 – you will get caught, it's just a matter of when

When (Metro)

Open with a super on the screen 'Say when'. We see two guys in a car driving down a main road. Super on screen says 'Tonight?' They see a police car with flashing lights but it overtakes and speeds on after someone else. Another day. On the screen is a super saying 'Next week?' The same guy is driving home dropping a few mates off after cricket. He turns into a side street and an unmarked police car is conducting breath tests. But he gets waved on. A few weeks later – super says 'Next month?' He is driving home with his girlfriend and this time is pulled over and tested. He is asked to get out of the car and come to the police station for further testing.
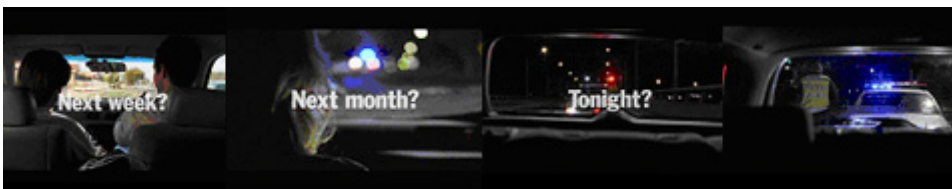
When (Regional)

Open with a super on the screen 'Say when'. We see two guys in a car driving down a road. Super on screen says 'Tonight?' They see a police car with flashing lights but it overtakes and speeds on after someone else. Another day. On the screen is a super saying 'Next week?' The same guy is driving home dropping a few mates off after football. He turns into a street and an police car is conducting breath tests. But he gets waved on. A few weeks later – super says 'Next month?' He is driving home with his girlfriend and this time is pulled over and tested. He is asked to get out of the car and come to the police station for further testing.
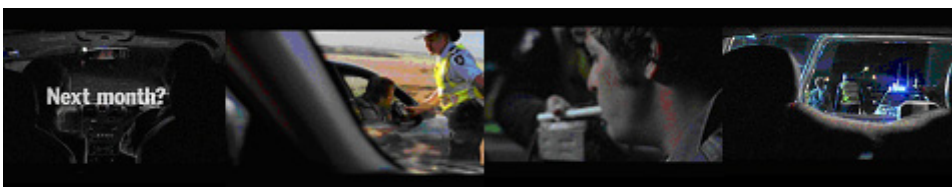
November 2005 Phase 4 EMOTIVE – you don't have to be drunk to be a drink driver

Haunted

We see a series of life events through one particular mans life as he grows older – in a park (about 22 years), on a bus, at work, at home with his kids, lying in bed at night, the marriage of his daughter and later back to the park (about 60 years). All the time there is a small boy watching him – as the ad progresses we realise the boy doesn't age and he is missing a shoe. We then discover that the man, as a 20ish man is being breath tested at the scene of a pedestrian accident and we hear that he is being told the boy he just hit has died. He blows .062 BAC.


November 2004 Phase 3 – EDUCATION/EMOTIVE – consequences of a conviction for drink driving

Netball

A father incurs the wrath of his wife and then sullen treatment from his daughter when he's unable to drive his daughter to her weekly netball game. We see them walking across a country town, only to arrive late. Another parent shoots the father an accusing look. A flashback then shows him being pulled up by police who disregard his pleas to be let off.

Insurance

A man on the phone renewing his car insurance discloses that he was recently caught for drink driving. He's shocked to hear that a drink driving record will affect his car insurance policy for many years to come through higher excesses, This is regardless of his rating or whether or not he's had a crash.
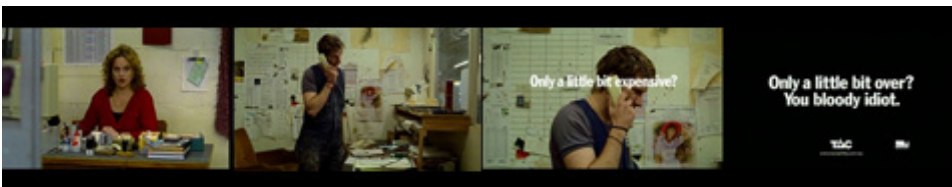
Unemployed

We overhear the conversation of a guy on the phone in a suburban family home. He's trying to arrange an extension on the payment of a bill. Gradually we realise that he is getting by on unemployment benefits. A flashback then shows him getting out of a work van and being lead away by police for drink driving. He vainly tries to explain that he needs his licence to work.
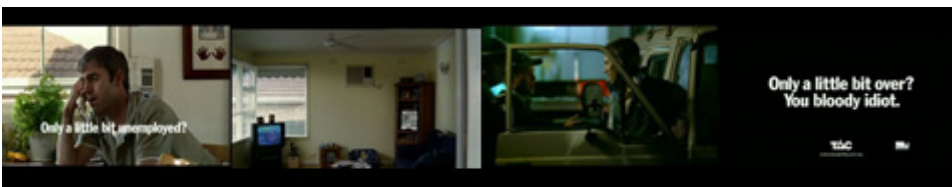
Boat

It's a perfect, sunny day - the sort of day that we should all be out enjoying. A boat is parked in a suburban yard, showing signs of lack of use. We then see the reason - it appears that the owner and his mates were out fishing when they were pulled over by police and the driver was breath tested. Although he may have had the least to drink of all his mates, he was over the limit and lost his driver's licence as well as his boat licence.

March 2004 Phase 2 - EDUCATION – demonstrating physical signs of impairment at low blood alcohol levels

The Little Things

Highlights some common social drinking situations - drinks at a workplace, at a friend's place, at a BBQ - where the drinkers show some typical signs of being affected by alcohol without being 'drunk'. While seemingly small impairments, they can affect the safe control of a car.

Only a little bit over? You Bloody Idiot. December 2003 Phase 1 - Set Agenda ENFORCEMENT 2 – low level drink driving is being targeted and detection is likely

Little Bit Dead

Sets the scene for the "little bit over" message by depicting three people affected by the actions of a drink driver - one seriously injured, one killed and one grieving. Parodies the blasé attitudes of some drivers to driving a little over the limit.
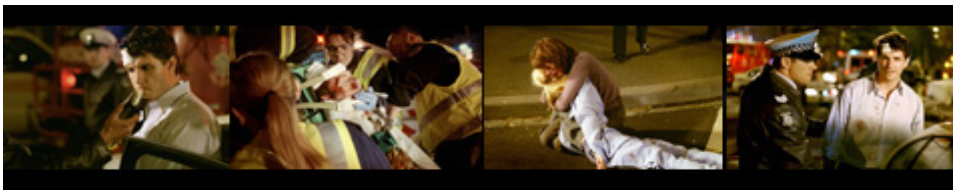
Little Bit Worried

Shows a driver who realises that he has probably had one drink too many and might be over the BAC limit. Despite hoping so, he does not get away with driving home while impaired and is apprehended by police and subjected to a breath test.
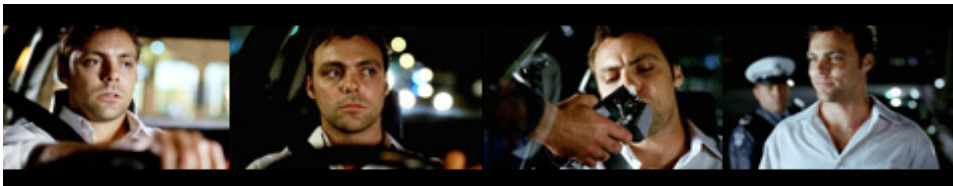
Drink Drive Bloody Idiot. December 2001 Phase 19 – ENFORCEMENT 1

See the Light (Booze Bus and Police Car)

These two linked advertisements highlight the increased chances of drink drivers being caught. This is a result of booze buses operating for longer periods, more unmarked police cars and a tough approach to enforcement at .05 and above.

Blue Squares

Reinforces the strong message that police will be out in force targeting drink drivers, with increased police resources on the road.

VicHealth

State Government
Victoria