The Effect of Community Interventions on Alcohol-related Assault in Geelong, Australia

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Abstract: Alcohol has consistently been demonstrated to increase levels of aggression and violence, particularly in late night licensed venues. Since 2005, the City of Geelong in Australia has implemented a substantial number of interventions to reduce alcohol related violence, including a liquor accord, increased police surveillance, ID scanners, CCTV, a radio network and an alcohol industry sponsored social marketing campaign. The aim of the current study is to assess the individual and collective impact of community interventions on indicators of alcohol-related assaults in the Geelong region. This paper reports stage one findings from the Dealing with Alcohol-related problems in the Night-time Economy project (DANTE) and specifically examines assault rate data from both emergency department presentations, ICD-10 classification codes, and police records of assaults. None of the interventions were associated with reductions in alcohol-related assault or intoxication in Geelong, either individually or when combined. However, the alcohol industry sponsored social marketing campaign 'Just Think' was associated with an increase in assault rates. Community level interventions appeared to have had little effect on assault rates during high alcohol times. It is also possible that social marketing campaigns without practical strategies are associated with increased assault rates. The findings also raise questions about whether interventions should be targeted at reducing whole-of-community alcohol consumption.

INTRODUCTION

Alcohol has consistently been demonstrated to increase levels of aggression and violence, particularly in late night licensed venues. Further, alcohol has been associated with domestic violence (Klostermann and Fals-Stewart, 2006; Salcedo and Carvalho, 2005), sexual assault (Abbey and Ortiz, 2008; Abbey *et al.*, 2002), and assault (Finney, 2004; Ingemann-Hansen and Brink, 2004). In Australia, a substantial proportion of the problems associated with alcohol and interpersonal violence arise in or around licensed premises in the night-time economy (NTE; Collins and Lapsley, 2008; Chikritzhs and Stockwell, 2002; Rowe *et al.*, 2010) and strong links between alcohol outlet density and violence have been documented (Livingston, 2008; Livingston *et al.*, 2007).

The most effective interventions for reducing alcohol-related harm (including violence) have centred on federal and state-wide control policies reducing access to alcohol through increased prices, reduced trading hours and reduced

number of outlets (Babor *et al.*, 2010; Miller *et al.*, 2010). At a community-level, the main approaches shown to be effective in reducing alcohol-related violence and injury revolve around enforcement of licensing laws (Babor *et al.*, 2010). The most prominent examples include the Alcohol Linking Program (Wiggers *et al.*, 2004), the Queensland Safety Action Project (Hauritz and Homel, 1998), and the Swedish Stockholm prevents alcohol and drug-problems (STAD; Wallin *et al.*, 2005) which have all been shown to be relatively successful. In contrast, other community level interventions have not been as successful in reducing harm. These include alcohol-interventions with licensees, community alcohol accords, and community action projects that include strategies such as banned patron lists; agreed levels of security surveillance; the implementation of ID scanners in high-risk licensed premises; use of two-way radios by security staff, agreements that police be contacted immediately upon the identification of problem patrons, and alcohol awareness campaigns (Graham and Homel, 2008). They can however be effective in bringing stakeholders together. Notwithstanding the lack of supportive evidence, such strategies are commonly applied at the local level (Graham and Homel, 2008).

In the context of such evidence and practice, the current study investigated the effect of a number of interventions in

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the city of Geelong, Australia. Geelong is unique when it comes to dealing with alcohol-related problems as it is one of the first cities in the world to implement a liquor accord (1991). The Geelong Liquor Accord (GLA) consists of police, licensees and council representatives meeting regularly to discuss and agree on strategies for dealing with alcohol-related problems (Rumbold *et al.*, 1998). A study of the GLA found an initial reduction in alcohol-related harm (Rumbold *et al.*, 1998). While the exact make-up of the GLA has changed over time, it continues today (see http://www.webcitation.org/5qfKjLHFJ), and consists of a number of principles and actions agreed to by all participating stakeholders. While this accord reflects a general sense of co-operation in the aim to reduce alcohol-related problems in the NTE, a number of venues continue to operate outside the accord regulations, and disagreement among participants still exists on some issues.

The local history of targeting alcohol-related harms in Geelong, has since 1991 precipitated the trials of over 25 different local interventions focussed on reducing alcohol-related violence. One intervention that was a direct outcome of the Liquor Accord involved the installation of a six camera CCTV network in 2003 which had expanded to include 24 cameras by the end of 2009. This network operates in conjunction with the Night-Watch Radio Program (NWRP). This was introduced in 2007 and connects security staff in licensed venues by two-way radios with city security camera operators, street cleaners, taxi rank staff, nearby fast food venues and police.

An additional outcome of the GLA was the implementation of ID-scanners in 2007 in every late night (post 1am) licensed venue in Geelong. Scanner technology varies from simple image recording to machines that can match ID images to photographs taken at the same time. Such scanners are also programmed to recognise 154 different types of ID from around the world, and can pick-out fake or altered IDs. In theory, every patron entering a venue is scanned, as well as recorded on CCTV, thus giving a record of when the individual entered the venue and how they were dressed as well as all of their personal identification details.

In 2008, with no involvement from the GLA or local Community Safety Committee, the 'Just Think' campaign was launched by the local tabloid newspaper, the Geelong Advertiser. This media campaign was funded by the alcohol industry social aspect/public relations organisation, Drinkwise. The campaign used football stars and other celebrities to endorse the message, 'we're not saying don't drink, we're saying just think', and further featured the pictures of battered victims alongside professional footballers. Just Think was run sporadically and determining an effect would thus involve identifying and controlling for a substantial number of confounding factors (Agostinelli and Grube, 2002; Austin, 2000).

Finally, Victoria Police also initiated Operation Nightlife 1 in 2007 which centred on maximum police visibility and increased man-power during high-risk hours (weekend evenings and early mornings).

Overall, although these interventions (see Table **1** for a summary) have been implemented in good faith, few of them were based on the available evidence, with none of them having been empirically evaluated since implementation - either individually or collectively. Most of these interventions continue to run in 2011, although the Just Think campaign has not been active since September 2010. In the context of the extensive activity to reduce alcohol-related harms in Geelong over an extended period, the current study was undertaken to assess the individual and collective impact of community interventions on indicators of alcohol-related assaults in the Geelong region of Victoria, Australia.

METHOD

The Context

Geelong is a city of approximately 205,000 people with a growth rate of 1.1% per annum. Located 70 kilometres from the state capital, Melbourne, it is both a regional centre and effectively a suburb of Melbourne, with over 11,000 people commuting to the capital every day.

Data

This paper reports stage one findings from the Dealing with Alcohol-related problems in the Night-time Economy project (DANTE) relating to assaults recorded by local police and hospitals within the postcode area of 3220, Geelong. Ethics permission to analyse hospital emergency department (ED) and Victoria Police data was obtained from the Deakin University Human Ethics Committee prior to commencement of the study (ethics approval number HEAG-H 16_09).

Further to this, Victoria Police assault data for the dates of 1 July, 2004 to 31 May, 2009 were obtained. Victoria Police data analysed in the report here refer to incidents (rather than number of people involved per incident) and report on all assault codes, including sexual assaults, recorded in the Victoria Police Law Enforcement Assistance Program (LEAP) database. Assault includes indictable and summary assault offences such as intentionally/recklessly causing injury, making threats to kill, reckless conduct endangering life/serious injury, unlawful assault, assault police (serious and summary) assault with weapon/instrument, and discharge missile/stone to injure/danger; (Victoria Police, 2011).

Lastly, ED ICD-10 codes pertaining to alcohol-related assault including anyone over 14 years old), and any X85 to Y09 or Y87.1 (sequelae of assault codes) for the period July 1, 1999 through January 31, 2008 were analysed. This data for the study was obtained from Barwon Health Geelong hospital records. Keyword searches of the triage records targeting cases of alcohol-related violence were manually conducted by five coders. This method has been shown to be effective within past research (Indig *et al.*, 2008).

The data were further aggregated to include only those incidents which occurred within the 'high alcohol hours' (HAH) of 8pm-6am Friday to Sunday morning (Laslett *et al.*, 2007). This resulted in a total of 536 ED-cases from the ED-keyword data, 822 cases from ED-ICD data, and 1688 from

the Victoria police data. Assaults occurring within the Geelong Local Government Area are analysed here, as they are comparable to the numbers of people ultimately attending the emergency department. Although this does have the limitation of not being specific to nightclub districts, it relates to alcohol-related assault across the community and any reductions in assaults in the entertainment district could be expected to impact on the overall trends.

Lastly, demographic data including age, gender and postcode of residence was collected for ED attendances. The data supplied by Victoria Police lacked sufficient detail to generate similar demographics

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. Alcohol-related assault rates were aggregated by week, and thus consisted of 214 time points through the time-frame of 1 July, 2005 to 31 July, 2009 for the ED-keyword data, and 254 time points through the time-frame of 1 July, 2004 to 31 May, 2009 for the police data. Each intervention was represented by a dichotomous dummy variable with values pre-intervention (0) and post-intervention (1).

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. However, multiple regression analyses can determine whether assault-rates post-intervention were significantly different to the rates pre-intervention.

RESULTS

Geelong Hospital ED Data

Demographics

For the ED keyword data-set, the age-range spanned from 15 to 77 with a mean age of 27 (SD=9.5), and a mode age of 20. The age-group 15-24 comprised over half of the entire set of instances with 56.7% ($n = 304$) of this age. Males were far more frequently involved in assault cases than were females, with 77.8% ($n = 417$) of triage presentations being male. The proportion of male/female offenders and ED attendees remained relatively stable over time.

For the ED-ICD data-set, the age-range spanned from 13 to 78 with a mean age of 27 (SD=9.9), and a mode age of 20. The age-group 15-24 comprised over half of the entire set of instances with 50.2% ($n = 267$) of this age. Males were far more frequently involved in assault cases than were females, with 75.4% ($n = 438$) of triage presentations being male.

Alcohol-related Assaults

According to triage-keyword records, the vast majority (73.7%: 486 of 659) of alcohol-related assaults took place on weekends between Friday evening and Sunday morning. Further, 48.4% ($n=235$) of weekend cases occurred on Sundays mornings alone, with 32.2% ($n=212$) of these cases presenting at triage on Sunday mornings between 12am and 6am - making this time of the week the most high-risk in terms of alcohol-related assaults presenting at ED. Findings from ICD data are very similar to those seen in the keyword searches.

Victoria Police Data

Utilising data from Victoria Police for the Geelong postcode, the frequency of assaults for time of day and day of week for peak times (see Fig. **1**) and month were calculated. 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. Sunday mornings had the
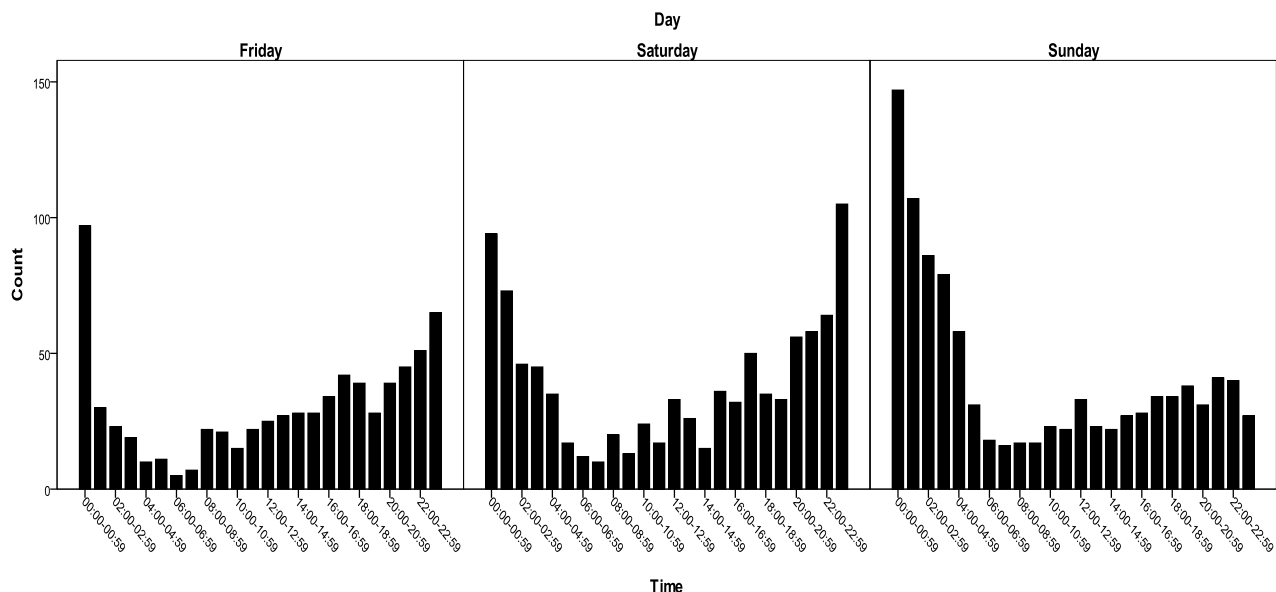

Fig. (1). Victoria Police arrests by time of day during high alcohol times in Geelong.

most assaults, occurring primarily during the high assault rate hours between midnight and 4am. Lastly, January was the month with the highest number of assaults.

Alcohol-related Assault Rates by Year

Fig. (**2**) below demonstrates the frequency of alcohol-related assaults, taken from Geelong police data, and ED keyword and ED-ICD10 data, with reference lines for each

of the four interventions implemented in 2007, 2008 and 2009. Data is presented quarterly as it demonstrates more robust trends and eliminates monthly fluctuations which often tend to obscure overall patterns. Fig. (**3**) demonstrates these rates at high-alcohol hours, using ED keyword data 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 the implemen-
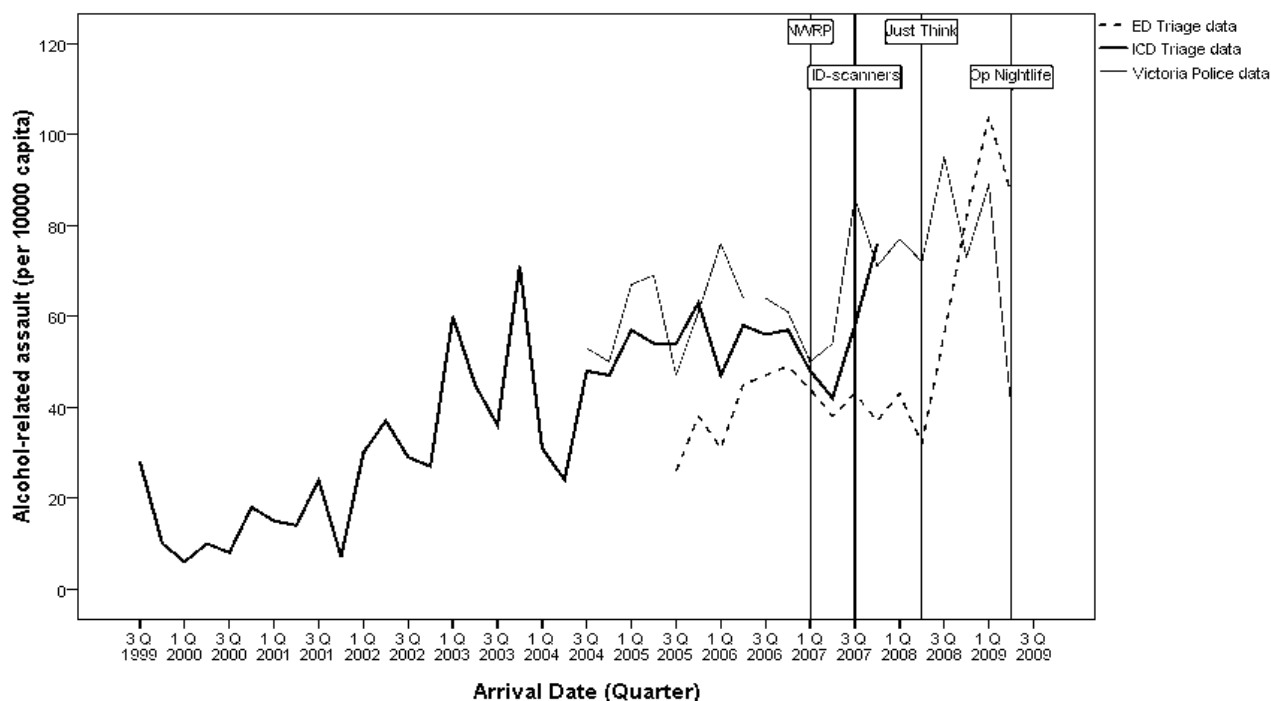

Fig. (2). Alcohol-related assault rates (per 10,000) by quarter and year (all hours) in Geelong.
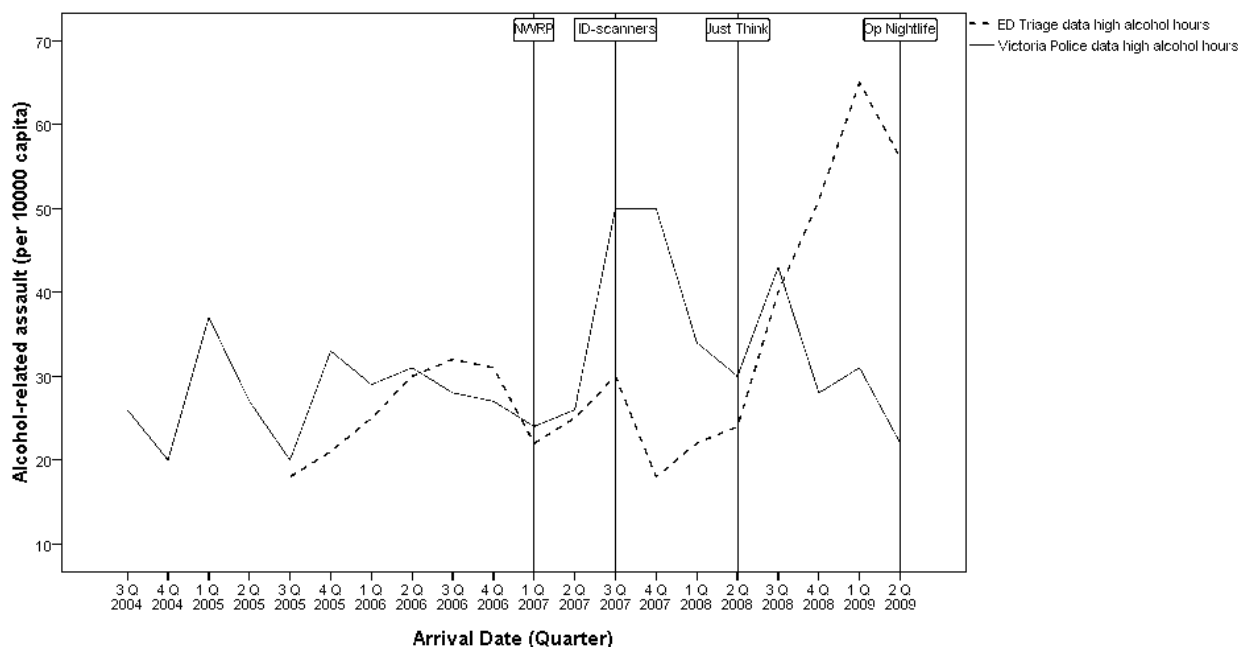

Fig. (3). Alcohol-related assault rates (per 10,000) by quarter and year (high alcohol hours) in Geelong.

tation date to make any judgements about the continuation of such an effect.

Regression Analysis

Linear regression analyses of the data were conducted to help ascertain the impact 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). All analysis was performed using SPSS 17.

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 (ED-data: skewness=.675, *SE*=.340; police data: skewness=.745, *SE*=.311) 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. In addition, there were only four time points, i.e., weeks, of post-intervention data for Operation Nightlife 2. For these two reasons the Operation Nightlife 2 intervention was not included in the analyses.

ED-data Regression

Two separate regression analyses were conducted on the triage data, 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 (HAH). 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% (3% 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% of the variability in alcohol-related assaults. As indicated in Table **1**, only the Just Think campaign generated a significant, unique association with increased 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. There were no significant changes in alcohol-related assault rates over time associated with the NWRP, ID-scanners or the Just Think campaign (see Table **2**).

DISCUSSION

Alcohol-related assault ED presentations in the Geelong region have risen consistently since 2005. Further, the rate of assaults in Geelong in the current study is similar to the Victorian average, and the observed increases in assaults match trends observed state-wide as well (Livingston *et al*., 2010). Importantly, none of the implemented interventions in Geelong have been associated with any measurable decrease in

Table 1.   Description of Alcohol-related Interventions Implemented in Geelong, Victoria

Name of intervention	Date implemented	Description
Night-Watch Radio Program	Mar 2007	Connection of security staff *via* radio with relevant personnel
ID-Scanners	Oct 2007	Matches ID images to photographs to detect fake IDs
Just Think	Jun 2008	Local celebrities endorsing safe drinking patterns
Operation Nightlife 1	Jan 2007	Maximum police visibility during high-risk hours
Operation Nightlife 2	Jun 2009	Improved radio contact between police and licensees
Safe Streets Taskforce	Dec 2008	Increase police visibility
Operation Razon	Apr 2008 onwards	Undercover police at licensed venues

Table 2.   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*

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

alcohol-related injury rates. While the 'Just Think' social marketing campaign was associated with increased ED presentations associated with alcohol use, causal attributions cannot be made in this context. While trying to determine the individual impact of any of these interventions was relatively difficult, we were fortunate that most of them were implemented in intervals of at least 6 months between each other. Such periods in between interventions has the potential to allow for secondary data to reflect any consequent changes in assault rates. However, it is possible that some effects might not occur immediately after implementation, and it is possible that some interventions may have a cumulative impact.

The reasons underlying the absence of any obvious change being associated with these interventions are open to speculation. The most likely explanation is that none of the interventions are consistent with evidence-based interventions, such as those which address total alcohol consumption (e.g. excise taxation on alcohol) have consistently been found to be the most – if not only - effective measures for reducing alcohol-related violence (Anderson *et al.*, 2009; Babor *et al.*, 2003; Babor *et al.*, 2010; Graham and Homel, 2008).

It is possible that the highly publicised examples of alcohol-related violence frequently used for the Just Think campaign might be increasing anxiety levels in people engaging in the night-time economy, and in effect increasing violence rates (Vasterman, 2005; Hall *et al.*, 1978). That is, rather than offering practical solutions to avoid or defuse potentially dangerous situations, the Just Think campaign might instead incite fear through sensationalising worst-case scenarios of violence in the NTE. This could conceivably contribute to a night-time environment in which violence is expected, and in turn make patrons more ready for violence, and more prone to interpret non-aggressive cues as the contrary (Borders *et al.*, 2007; Leonard *et al.*, 2003; Quigley and 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 (Graham and Homel, 2008). Alternatively, the use of the Just Think campaign may have resulted in a promotion of licensed premises as safe venues to frequent, leading to an increase in patronage. An increase in patronage may, in turn, lead to increased violence simply because of the greater density of people within licensed venues. Lastly, the Just Think campaign promotes drinking wisely. Given the presence of a culture within Geelong that advocates drinking to excess, it may be that people are unaware of what drinking 'wisely' constitutes. Therefore, it may be that patrons are not significantly reducing their alcohol consumption as a consequence of the Just Think campaign, and consequently alcohol-related assaults are not reduced.

Finally, it is also worth noting the different trends since 2008 between ED data and police arrest data, with ED data indicating a steady increase in assault rates and police data showing a decline in assault rates during 2008. It is possible

strategies to reduce alcohol-related harms around night-time environments have increased in the city centre, more people will turn to drinking at home or going to suburban licensed venues, but this requires more detailed data than available in Victoria.

Limitations

There are a number of limitations to this study. Firstly, it should be noted that both the ED-data and police-data most likely underestimate the actual frequencies of alcohol-related assaults and aggression. 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. On the other hand, assaults recorded by Victoria Police also rely, at least partially, on policing activities and can be dependent on where resources are targeted. For these reasons, it seems likely that a substantial proportion of alcohol-related cases go undetected. The lack of ED and Victoria Police cases also limits the power of the regression analysis in the current study.

Secondly, while the data forming the basis for the study help considerably 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. Further, there are some problems related to studying a smaller city such as Geelong, as the number of cases occurring tends to limit the analyses which can be used. Most importantly, none of the measures directly address alcohol consumption levels beyond licensed venues, and yet the proportion of alcohol sales in the community is dominated by bottle-shop (or off-premises) sales. As alcohol consumption per se remains the main identifiable and actionable, element of violence throughout the community, these findings suggest that measures which reduce consumption outside licensed venues also warrant further investment and investigation.

Consideration should also 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. Lastly, the current study lacks a control area for comparison to more fully investigate the

effect of the studied internventions on alochol-related assualt rates.

CONCLUSION

In summary, the interventions implemented in Geelong do not appear to be associated with any reductions in alcohol-related harm. 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 somewhat 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), combine to suggest that these trends will continue without measures to reduce whole-of-community alcohol consumption such as reducing the availability of alcohol (restricting venue numbers and trading hours), access to alcohol (through increased price and minimum purchase age) and alcohol advertising (Babor *et al.*, 2010).

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CONFLICT OF INTEREST

None Declared

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