Drug and Alcohol Review (June 2012), 31, 370–376 DOI: 10.1111/j.1465-3362.2011.00375.x

The long-term effect of lockouts on alcohol-related emergency department attendances within Ballarat, Australia

PETER MILLER, KERRI COOMBER, ANDERS SØNDERLUND & STEPHEN MCKENZIE

School of Psychology, Deakin University, Geelong, Australia

Abstract

Introduction and Aims. Alcohol has consistently been demonstrated to increase levels of aggression and violence, particularly in late night licensed venues. Since August 2003, Ballarat (a regional city of approximately 95 000 inhabitants, in Victoria, Australia) has implemented a 3:00 AM 'lockout' with the goal of reducing alcohol-related harms. This paper is the first long-term analysis of the effect of this type of intervention on emergency department (ED) attendances. The aim of this paper is to examine the effectiveness of a lockout intervention within the city of Ballarat, Victoria on alcohol-related ED presentations. **Design and Methods.** This paper examines alcohol-related injury frequencies pre- to post-lockout intervention in Ballarat, Victoria, from 1999 to 2009, as indicated by ED International Classification of Diseases codes for acute alcohol intoxication and assault. These data are further compared with similar data from Geelong, Victoria, as a control. **Results.** A small reduction in alcohol-related assaults and intoxication rates within Ballarat occurred before and after the introduction of the lockout. However, after this decline these rates steadily increased, surpassing Geelong by 2005. **Discussion and Conclusions.** There is no discernible long-term impact on alcohol-related ED attendances of the lockout intervention in Ballarat. As such, other interventions may be more appropriate to reduce alcohol-related ED attendances. [Miller P, Coomber K, Sønderlund A, McKenzie S. The long-term effect of lockouts on alcohol-related emergency department attendances within Ballarat, Australia. Drug Alcohol Rev 2012;31:370–376]

Key words: alcohol, violence, licensed venue, lockout, trading hour.

Introduction

Alcohol has consistently been demonstrated to increase levels of aggression and violence, particularly in late night licensed venues. Importantly, this major public health issue is ultimately preventable. Many interventions have been employed around the world to reduce or prevent alcohol-related harms, although few have proved effective when exposed to scientific scrutiny. One such intervention that has been implemented is a lockout strategy where entry to venues is refused after a designated time (e.g. 2:00 AM). The aim of the current paper is to examine the effectiveness of a lockout intervention within the city of Ballarat, Australia on reducing alcohol-related emergency department (ED) presentations. These data are compared with a nearby control site, Geelong, Australia [1].

Ballarat and Geelong report higher than average rates of alcohol-related harm than the State of Victoria [2], although this differs depending on the indicator (i.e. hospital admission or alcohol-related traffic accidents) [3]. Widespread community acceptance of alcohol-related antisocial behaviour, and even alcohol-related violence, may be accentuated in regional areas, due to significant sections of the community regarding these behaviours as 'fun' or 'masculine' [3]. Licensed venues are most often identified as the sites where people drink, and also where most harm is experienced [4]. In this context, communities continue to struggle with measures that are effective in reducing alcohol-related harm on the one hand, while still providing opportunities for entertainment and socialisation.

Effective interventions at reducing alcohol-related violence

In Australia, a substantial proportion of the problems associated with alcohol and interpersonal violence arise in and around licensed premises in the night-time

Received 3 April 2011; accepted for publication 24 August 2011.

Peter Miller PhD, Senior Research Fellow, Kerri Coomber B App Sci (Hons), Research Fellow, Anders Sønderlund BA (Hons), Research Assistant, Stephen McKenzie PhD, Lecturer. Correspondence to Dr Peter Miller, School of Psychology, Deakin University, Locked Bag 20000, Geelong, Vic. 3220, Australia. Tel: +61 (0)3 5227 8138; Fax: +61 (0)3 5227 8621; E-mail: petermiller.mail@gmail.com

economy (NTE) [5,6]. Strong links exist between alcohol outlet density and violence [7]. There is also a strong inverse relationship between alcohol-related violence and alcohol pricing [8,9] and outlet opening hours [10]. Specifically, longer trading hours leads to higher blood alcohol levels in drivers [11], incidence of road crashes while intoxicated [12], and levels of violence [6].

On a community scale, an effective intervention to reduce general violence is sharing of ED and police data within the wider community in order to develop appropriate policies and other prevention strategies [13]. In regards to alcohol-related violence, voluntary alcohol interventions with licensees, community alcohol accords, police programs and community action projects constitute the main approaches to reducing alcohol-related violence and injury [14]. These initiatives generally have a smaller impact than the more comprehensive policy interventions, but can nonetheless be extremely valuable within a community. The most noteworthy of such interventions include the Alcohol Linking Program [15], the Queensland Safety Action Project [16] and the Swedish Stockholm prevents alcohol and drug problems (STAD) [17], which have all been proven to be relatively successful at reducing risky drinking and alcohol-related harm.

Lockouts

One proposed alternative to reducing trading hours in order to reduce alcohol-related harm is licensed venue 'lockouts' [sometimes called curfews where venues do not allow patrons to enter a premises after a specified time (e.g. 2:00 AM)]. Patrons can, however, continue to consume alcohol after this time [14]. This approach is based on the rationale that much of the alcohol-related violence in the NTE is due to movement of people between venues during early morning hours, despite a substantial body of evidence, which identifies levels of intoxication as the major determinant of alcoholrelated violence [18]. Research examining this type of intervention is very limited, and has generated ambiguous results.

Currently, the lockout intervention appears to have been utilised mostly within Australia [14], although there is at least one non-Australian example [19]. Bleetman *et al.* described Operation Blade which was conducted in Glasgow, Scotland, and had the primary aim of reducing knife crime [19]. This intervention included a 'curfew', whereby the Glasgow District Licensing Board altered permitted hours in night clubs from 3:00 AM to 2:00 AM, and admission or readmission of patrons was prohibited after midnight ('curfew'). They found that 'Increased police presence and the introduction of the clubs' curfew had no significant impact on average daily (emergency department) attendances or on the time of attendance' ([19], p. 155).

One recent study on lockout interventions within the Gold Coast area of Queensland, Australia [20] examined the effectiveness of a 5 week trial 3:00 AM lockout during 2004 using general police data. During the lockout trial period, there were statistically significant reductions in street disturbances (12.3% reduction, P = 0.0005) and sexual assaults (33.7% reduction, P = 0.004); however, no significant declines were found for general assaults, property damages or stealing. As such, inconsistencies exist regarding the effectiveness of lockouts. The Queensland lockout was only evaluated over a 5 week trial period and such a short trial duration undoubtedly results in very speculative conclusions.

There is also one evaluation of the Ballarat lockout, using police data for the 12 months prior to the lockout and for 12 months after the lockout [21]. The findings indicated a decrease in reported assaults within licensed premises (47.5%) and public places (33.3%) following the lockout implementation. Further, there was a decrease in overall property damage outside of licensed premises (17.3%); however, property damage to licensed premises increased (25%). While there were decreases in assaults and property damage during the first 12 months of the lockout implementation, this decrease began 6 months prior to the implementation of the lockout. The evaluation period coincided with an increased police presence in the city on Friday and Saturday nights, regular liaison with venue operators, security personnel and increased patrols in both marked and unmarked police vehicles [21]. Thus, it is impossible to determine if the reduction in assaults is due to the lockouts or the increased police action, as also described in the Glasgow trial [19]. In light of these limitations and the lack of evidence regarding such interventions, the present study seeks to use the most sensitive and reliable measure of alcohol-related harm (ED attendance data; [22,23]) to evaluate the longterm effects of lockouts in the Ballarat community.

Methods

The size and trend of the alcohol-related harm and the impact of the lockout within Ballarat will be presented in terms of ED presentations. Comparisons to alcoholrelated problems in the Geelong NTE, which has not adopted a lockout policy, will be made.

Context

Ballarat. Ballarat is the third most populous city in Victoria (95 000 people) with a growth rate of 1.5% per annum [24]. It is located 105 kilometres north-west of

372 *P. Miller* et al.

Melbourne and 88 kilometres from Geelong. Ballarat has a substantial night-life with 169 licensed premises in 2004 (including 44 general licenses and 68 on-premise licenses), increasing to 180 in 2008 (including 42 general licenses and 67 on-premise licenses) [25]. The lockout strategy was introduced on 1 August and required all late night entertainment venues to refuse entry after 3:00 AM.

Geelong. Geelong is being used as a control site to contrast the effects of the lockout over a long-term period. Geelong is a regional centre of approximately 205 000 people with a growth rate of 1.1% per annum. Located 70 kilometres south-west from Melbourne, Geelong has a substantial night-life with 142 licensed premises in 2004 (31 general licenses; 77 on-premise licenses), increasing to 153 in 2008 (28 general licenses; 80 on-premise licenses) [25]. A general licence permits the supply of alcohol to customers for drinking on the premises, and to take away (e.g. pubs, hotels and nightclubs). Geelong has also implemented a number of community-driven interventions and was one of the first cities in Australia to implement a Liquor Accord in 1991, where police, licensees and council representatives met regularly to discuss and agree on strategies for dealing with alcohol-related problems [26,27]. The Accord [26] has created a general sense of cooperation in Geelong over many issues connected to alcoholrelated problems. There is, however, still much debate over the effectiveness of various strategies, and a lockout policy is not currently implemented in Geelong [28].

Data

Case-level data for the study were obtained from the Department of Human Services records for the dates of 1 July 1999 through 31 July 2009. Both alcohol-related assaults and alcohol-abuse cases were included. Alcohol abuse consisted of any International Classification of Diseases-10 F10.0 (acute drunkenness due to alcohol) event in any of the 40 diagnosis codes. Alcohol-related assault included anyone over 14 years old, and any X85 to Y09 (which includes homicides and injuries inflicted by another person with intent to injure or kill, by any means) or Y87.1 (sequelae of assault) codes. There were 3069 cases in Geelong and 1111 cases in Ballarat. Blood alcohol concentration data are not collected by hospital staff.

While police records might provide added insight into the instances of alcohol-related violence which are intercepted and resolved on the street rather than in EDs [22], previous research has repeatedly highlighted the greater sensitivity of ED records in describing alcohol-related harm in the community [22,23,29]. For instance, assaults recorded by police rely on policing activities and can be dependent on where resources are targeted [30]. Also, many people do not report assaults to police for a variety of reasons. Therefore, it was decided that ED records would provide a more reliable picture of alcoholrelated harm over time [22,23].

Analyses

Data were further aggregated to include only those cases which occurred within the 'high alcohol hours' of 8 PM-6 AM Friday to Sunday morning [2]. This resulted in a total of 337 cases for Ballarat and 766 cases for Geelong. Interrupted Time Series Analysis, using SPSS Expert Modeler (SPSS Inc., Chicago, IL, USA), was conducted on the Ballarat data to determine the potential impact of the lockout intervention on ED presentations. The lockout variable was designated as dichotomous 'event' variables (0 = pre-intervention, 1 = post-intervention).

Results

During high-alcohol hours in Ballarat, the most common age group attending the ED with alcohol-related injuries was 15–24, with 47.5% (n = 160) of people within this group (Geelong: 41.7%, n = 320). Over two-thirds (69.4%, n = 234) of ED presentations were male (Geelong: 81.3%, n = 623).

Figure 1 presents the percentage of alcohol-related presentations for time of day (by hour) over the weekend period in Ballarat before and after 2003 (when the lockout was implemented). Rates of admission over the weekend, rather than the entire week are used, as high-alcohol hours are the focus of this study; Figure 1 indicates that alcohol admissions peak during high-alcohol hours. The trends of people presenting at Ballarat ED have not substantially changed after the introduction of the lockout in 2003. Figure 1 also shows the rate for time of admissions rates peak between midnight and 6:00 AM.

Figure 2 presents the rates per 10 000 of alcoholrelated ED presentations (assault and intoxication) during high-alcohol hours for Geelong and Ballarat per half year. Population statistics were obtained for both Geelong and Ballarat local government areas from the Australian Bureau of Statistics [31,32]. Following a stable period for the first 6 months, there was a decrease in ED attendance rate for the following 6 months before they began to increase again in late 2004 to early 2005, surpassing Geelong by late 2005/ early 2006.

Need for a nationally-consistent approach to alcohol-fuelled violence Submission 47 - Attachment 25



Figure 1. Percentage of alcohol-related emergency department presentations in Ballarat (pre- and post-lockout implementation) and Geelong by time of admission (Friday–Sunday).



Figure 2. Rates per 10 000 of alcohol-related emergency department presentations (assault and intoxication) for Ballarat and Geelong local government areas during high alcohol hours per half year.

Using quarterly time points to obtain a greater number of observations trends in alcohol intoxication and assault were examined using a curve estimation to obtain an R^2 value for 2003 and earlier (pre-lockout) and post-2003 (post-lockout). For Ballarat during 2003 and earlier there was no significant trend in the data. However, for post-2003 there was a strong positive trend for combined alcohol intoxication and assault

© 2011 Australasian Professional Society on Alcohol and other Drugs

374 *P. Miller* et al.

 $(R^2 = 0.74, P < 0.05)$. In comparison, in Geelong during 2003 and earlier there was a moderate positive trend $(R^2 = 0.44, P < 0.05)$. However, this positive trend decreased post-2003 $(R^2 = 0.25, P < 0.05)$.

Lastly, time series analysis using monthly aggregated data (120 observations) was used to examine the potential impact of the lockout intervention on the alcoholrelated ED presentations per 1000 people in Ballarat. Autocorrelation and partial autocorrelation graphs were examined. In addition, the Durbin-Watson statistic indicated a significant positive autocorrelation $(d = 1.103 < d_{L_{100}} = 1.634)$. Therefore, time series analyses could be applied. The model was specified as an exponential smoothing simple seasonal model, indicating that there was a seasonal trend in the original data. The model fitted the data well (stationary $R^2 = 0.73$), no outliers were detected and the model was correctly specified (Ljung-Box statistic P = 0.21). The model showed that the lockout was not a significant predictor of ED presentation rates within Ballarat.

Discussion

The current study explored the long-term impact of the 3:00 AM lockout implemented in Ballarat on 1 August 2003 by examining rates of alcohol-related ED presentations. The ED presentation rates within Ballarat were then compared with Geelong, where no lockout policy is in place. Ballarat ED alcohol-related assault and intoxication presentation rates declined prior to the implementation of the lockout, followed by a small rise and then a more substantial drop for 6 months post-lockout. However, after this initial decline, ED presentation rates steadily increased and surpassed that observed in Geelong by the end of 2005.

The previous evaluation of the Ballarat lockout [21] reported the implementation of the lockout as a success, whereas the current research suggests that the observed positive effects were short-lived. Further, the reduction in ED presentation rates is not necessarily attributable to the lockout implementation as police and community attention was also focussed on alcohol-related issues during this time [19]. In particular, policing activity pre- and post-introduction of the lockout was higher than normal levels and could account for a proportion of the reductions noted. This is very likely to be the case prior to the introduction of the lockout in Ballarat.

Additionally, in response to the increases in alcoholrelated harm, Ballarat has recently changed the lockout time from 3:00 AM to 2:30 AM (2 April 2010) as well as introducing a ban on service of alcoholic shots after 1:00 AM [33]. Lastly, the increase in alcohol-related harms may be related to the increased number of liquor licenses issued within Ballarat [22]. However, only 14 new liquor licenses overall were issued within Ballarat between 2004 and 2009. In particular, there were two fewer general licences (including pubs, hotels and taverns) and only one new on-premise licence (including nightclubs). Literature indicates that increases in alcohol outlet density, within a local postcode area, increase the levels of binge drinking and alcohol-related injuries and violence [34].

The findings of this study suggest that lockouts, as a stand-alone intervention, are unlikely to have a sustained effect on ED attendances for either assault or intoxication. This accords with the current available evidence which shows that increased alcohol consumption equals increased harm [18,35], particularly violence [14,36–38]. While lockouts might reduce the number of people moving between venues, there remains no clear evidence that this reduces violence, particularly at closing time. This also fails to address other related concerns, such as the availability of transport [39], and suggests more comprehensive responses, including intelligence-based policing [15], whole of community mobilisation [40,41] and better trained staff [42,43]. While the findings from the current study demonstrate little effect over the long term from the introduction of a lockout, there is a lack of comprehensive evaluations of these types of interventions, and much more research is required [44].

Limitations

There are a number of limitations with this study. Firstly, it should be noted that the ED data most likely underestimate the actual frequencies of alcohol-related injury [45,46]. This assumption is based primarily on the reality that injuries sustained as a result of alcohol intoxication do not always require medical attention. Such cases would therefore not be represented in either data-set. Therefore, the current study is based on a small sample size. This small sample size may explain some of the volatility in the data. 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 alcoholinvolvement. Despite this, the use of primary injury codes and the 'high alcohol hours' formula has been demonstrated to reliably track trends over time [2] and is therefore an appropriate measure for this study.

Secondly, while the data forming the basis for the study help greatly in understanding the long-term effectiveness of a lockout strategy in relation to alcoholrelated ED admissions, there are other information sources which could provide a more complete description of this problem. For example, ambulance data would certainly add to the level of detail available, although ambulance call-out data for the Ballarat region was not collected in electronic form until late 2008.

Lastly, the current findings are limited by the retrospective, case-control type design. Therefore, conclusions regarding the ineffectiveness of the lockout intervention in Ballarat are preliminary. A randomised control trial would be the most appropriate way to assess the impact of interventions on alcohol-related harms in the community. Future research is needed to investigate the impact lockouts have on the rates of alcohol-related harms.

Acknowledgements

Many thanks to the Victorian Department of Human Services for supplying data. Thanks also to Michael Livingston and Belinda Lloyd for advice on data coding. Special thanks to Kathy Reynolds from Responsible Alcohol Victoria for licensing information.

References

- Miller P, Sønderlund A, Coomber K, *et al.* Do community interventions targeting licensed venues reduce alcoholrelated emergency department presentations? Drug Alcohol Rev 2011;30:546–53.
- [2] Laslett A, Matthews S, Dietze P. The Victorian Alcohol Statistics Handbook Volume 8: alcohol use and related harm among young people across Victorian Local Government Areas 2006. Melbourne: Turning Point Alcohol and Drug Centre for the Department of Human Services, 2007.
- [3] Miller PG, Coomber K, Staiger P, Zinkiewicz L, Toumbourou JW. A review of rural and regional alcohol research in Australia. Aust J Rural Health 2010;18:110–17.
- [4] Buss TF, Abdu R, Walker JR. Alcohol, drugs, and urban violence in a small city trauma center. J Subst Abuse Treat 1995;12:75–83.
- [5] Collins DJ, Lapsley HM. The costs of tobacco, alcohol and illicit drug abuse to Australian Society in 2004/05. NCADA monograph. Canberra: Australian Government, 2008. Report No.: 30.
- [6] Chikritzhs T, Stockwell T. The impact of later trading hours for Australian public houses (hotels) on levels of violence. J Stud Alcohol 2002;63:591–9.
- [7] Livingston M. A longitudinal analysis of alcohol outlet density and assault. Alcohol Clin Exp Res 2008;32:1074–9.
- [8] Cook PJ, Moore MJ. Violence reduction through restrictions on alcohol availability. Alcohol Health Res World 1993;17:151–6.
- [9] Matthews K, Shepherd J, Sivarajasingham V. Violencerelated injury and the price of beer in England and Wales. Appl Econ 2006;38:661–70.
- [10] Dualibi S, Ponicki W, Grube J, Pinsky I, Laranjeira R, Raw M. The effect of restricting opening hours on alcoholrelated violence. Am J Public Health 2007;97:6.
- [11] Chikritzhs T, Stockwell T. The impact of later trading hours for hotels (public houses) on breath alcohol levels of apprehended impaired drivers. Addiction 2007;102:1609– 17.

- [12] Chikritzhs T, Stockwell T. The impact of later trading hours for hotels on levels of impaired driver road crashes and driver breath alcohol levels. Addiction 2006;101:1254– 64.
- [13] Florence C, Shepherd J, Brennan I, Simon T. Effectiveness of anonymised information sharing and use in health service, police, and local government partnership for preventing violence related injury: experimental study and time series analysis. BMJ 2011; DOI: 10.1136/bmj.d3313.
- [14] Graham K, Homel R. Raising the bar: preventing aggression in and around bars, pubs and clubs. Laycock G, ed. London: Willan, 2008.
- [15] Wiggers J, Jauncey M, Considine R, *et al.* Strategies and outcomes in translating alcohol harm reduction research into practice: the Alcohol Linking Program. Drug Alcohol Rev 2004;23:355–64.
- [16] Hauritz M, Homel R. Reducing violence in licensed venues through community safety action projects: the Queensland experience. Contemp Drug Probl 1998;25:511–51.
- [17] Wallin E, Andreasson S, Stockwell T, Gruenewald PJ, Toumbourou JW, Loxley W. Effects of a community action program on problems related to alcohol consumption at licensed premises. Preventing harmful substance use: the evidence base for policy and practice. New York: John Wiley & Sons Ltd, 2005:207–23.
- [18] Babor TF, Caetano R, Casswell S, *et al.* Alcohol: no ordinary commodity—research and public policy, 2nd edn. Oxford: Oxford University Press, 2010.
- [19] Bleetman A, Perry CH, Crawford R, Swann IJ. Effect of Strathclyde police initiative "Operation Blade" on accident and emergency attendances due to assault. J Accid Emerg Med 1997;14:153–6.
- [20] Palk G, Davey J, Freeman J. The impact of a lockout policy on levels of alcohol-related incidents in and around licensed premises. Police Pract Res 2010;11:5–15.
- [21] Operation Link: Be Safe Late (OLBSL) Program. Program evaluation prepared by Centre for Health Research and Practice. Ballarat: University of Ballarat, 2004.
- [22] Shepherd J, Shapland M, Scully C. Recording of violent offences by the police: an accident and emergency department perspective. Med Sci Law 1989;29: 251–7.
- [23] Shepherd JP, Sivarajasingam V, Rivara FP. Using injury data for violence prevention. BMJ 2000;321:1481.
- [24] Australian Bureau of Statistics. 1100.2—Statistics Victoria (Newsletter), Mar 2007. Canberra: Australian Government Publishing Service, 2007.
- [25] Responsible Alcohol Victoria. Number of licences by category 2004–2009. Melbourne: Responsible Alcohol Victoria, 2010.
- [26] Rumbold G, Malpass A, Lang E, Cvetkovski S, Kelly W. Evaluation of the Geelong local industry accord: final report. Melbourne: Turning Point Alcohol and Drug Centre Inc, 1998.
- [27] Felson M, Berends R, Richardson B, Veno A. Reducing pub hopping and related crime. In: Homel R, ed. Policing for prevention: reducing crime, public intoxication and injury, in crime prevention studies. New York: Criminal Justice Press, 1997:115–32.
- [28] Miller PG, Sonderlund A, Palmer D. Dealing with Alcohol and the Night-Time Economy (DANTE) Stage One final report: literature review and baseline trends (2000-2009). Melbourne: School of Psychology, Deakin University for the Australian Drug Foundation, VicHealth and Traffic Accident Commission, 2010.

Need for a nationally-consistent approach to alcohol-fuelled violence Submission 47 - Attachment 25

376 *P. Miller* et al.

- [29] Shepherd J, Sivarajasingam V. Injury research explains conflicting violence trends. Inj Prev 2005;11:324.
- [30] Hobbs D, Lister S, Hadfield P, Winlow S, Hall S. Receiving shadows: governance and liminality in the night-time economy. Br J Sociol 2000;51:701–17.
- [31] Australian Bureau of Statistics. 3218.0 Regional Population Growth, Australia, 2009–10. 2011 [updated 31 March 2011]. Available at: http://www.abs.gov.au/AUSSTATS/ abs@.nsf/DetailsPage/3218.02009-10?OpenDocument (accessed 21 September 2011).
- [32] Australian Bureau of Statistics. 3218.0 Regional Population Growth, Australia, 1996 to 2006. 2008 [updated 19 August 2008]. Available at: http://www.abs.gov.au/AUSSTATS/ abs@.nsf/DetailsPage/3218.01996%20to%202006? OpenDocument (accessed 21 September 2011).
- [33] ABC Ballarat. Hope for pubs lockout to cut assault rate. 2010; Available at: http://www.abc.net.au/news/2010-04-01/hope-for-pubs-lockout-to-cut-assault-rate/389126 (accessed 21 September 2011).
- [34] Livingston M, Chikritzhs T, Room R. Changing the density of alcohol outlets to reduce alcohol-related problems. Drug Alcohol Rev 2007;26:557–66.
- [35] Rossow I, Hauge R. Who pays for the drinking? Characteristics of the extent and distribution of social harms from others' drinking. Addiction 2004;99:1094–102.
- [36] Leonard KE. Alcohol's role in domestic violence: a contributing cause or an excuse? Acta Psychiatr Scand 2002; 106:6.
- [37] Leonard KE. Alcohol and intimate partner violence: when can we say that heavy drinking is a contributing cause of violence? Addiction 2005;100:422–5.

- [38] Graham K, West P, Wells S. Evaluating theories of alcoholrelated aggression using observations of young adults in bars. Addiction 2000;95:847–63.
- [39] Homel R, Carvolth R, Hauritz M, McIlwain G, Teague R. Making licensed venues safer for patrons: what environmental factors should be the focus of interventions? Drug Alcohol Rev 2004;23:11.
- [40] Wallin E, Gripenberg JA, Andreasson S. Overserving at licensed premises in Stockholm: effects of a community action program. J Stud Alcohol 2005;66:806–14.
- [41] Wallin E, Norstrom T, Andreasson S. Alcohol prevention targeting licensed premises: a study of effects on violence. J Stud Alcohol 2003;64:270–7.
- [42] Graham K, Osgood W, Zibrowski E, et al. The effect of the Safer Bars programme on physical aggression in bars: results of a randomized controlled trial. Drug Alcohol Rev. 2004;23:31–41.
- [43] Graham K, Wells S, Jelley J. The social context of physical aggression among adults. J Interpers Violence 2002;17: 64.
- [44] Graham K. Fiddling while Rome burns? Balancing rigour with the need for practical knowledge. Addiction 2008;103:414–15.
- [45] Indig D, Copeland J, Conigrave KM, Arcuri A. Characteristics and comorbidity of drug and alcohol-related emergency department presentations detected by nursing triage text. Addiction 2010;105:897–906.
- [46] Indig D, Copeland J, Conigrave KM, Rotenko I. Why are alcohol-related emergency department presentations under-detected? An exploratory study using nursing triage text. Drug Alcohol Rev 2008;99:1–7.