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Impact of extended drinking hours in Ontario on motor-vehicle collision and non-motor-vehicle collision injuries*

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Abstract

Objective—On May 1, 1996, Ontario, Canada, amended the Liquor Licence Act to extend the hours of alcohol sales and service in licensed establishments from 1 AM to 2 AM. The purpose of this study was to evaluate the impact of extended drinking hours in Ontario on motor-vehicle collision (MVC) and other injuries admitted to regional trauma units based on Ontario Trauma Registry data.

Method—A quasi-experimental design using interrupted time series was used to assess changes in admissions to Ontario trauma units. The analyzed data sets were monthly data on number of admissions from MVC and other causes of injury during the 11 PM–12 AM, 12–1 AM, 1–2 AM, and 2–3 AM time windows for 4 years before and 3 years after the policy change (May 1992–April 1999).

Results—For MVC injuries, no significant pre-post increases were found for the 2–3 AM period commensurate with the introduction of the extended drinking hours, but decreases were found for the 11 PM–12 AM and 1–2 AM periods. For non-MVC injuries, a significant increase was found for the 2–3 AM period.

Conclusions—The data sets suggest that increased availability of alcohol as a result of extension of closing hours had an impact on non-MVC injuries presenting to Ontario trauma units, but road safety initiatives may have mediated the effects of the extension on MVC injuries. These observations are consistent with those of other studies of small changes in alcohol availability.

Alcohol control policies are a set of public health measures that governments, agencies, or industry can use to influence the level of alcohol problems in a society (Room et al., 2005). Alcohol control policies are based on availability theory, which posits that alcohol availability influences consumption levels, which in turn influence harms, such as injuries, in society (Anatalova and Martinic, 2005; Chikritzhs et al., 1997; Grube and Stewart, 2004; Ragnarsdottir et al., 2002; Rush et al., 1986).

Alcohol control policies can take the form of restrictions on hours of sale/service for which alcohol may be sold for both off- and on-premise consumption (Anatalova and Martinic, 2005). However, during the past decade, international trends have been toward privatization, deregulation, and liberalization of and fewer controls on alcohol sales and service (Norstrom and Skog, 2005; Vingilis et al., 1998). One example of liberalization occurred in the province of Ontario with the extension of drinking hours in licensed establishments. On May 1, 1996, Ontario, Canada, amended the Liquor Licence Act to extend the closing hours for alcohol sales and service in licensed establishments from 1 AM to 2 AM. This amendment provided an

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important natural experiment to evaluate the effects of a small increase in availability of alcohol.

Other hypotheses exist to suggest what might happen with a small increase in availability represented by the 1-hour extension of closing hours. For on-premise consumption, “power drinking,” “last call,” or “six o’clock swill” has been suggested as a competing hypothesis (Chikritzhs et al., 1997; Foster, 2003; Grube and Stewart, 2004; Ragnarsdottir et al., 2002; Room, 1988). This hypothesis suggests that tight restrictions on closing times lead to great numbers of drinkers consuming as much alcohol as possible at “last call” for the service of alcohol, shortly before the licensed establishment closes. This means increased blood alcohol concentrations (BACs) of patrons as they imbibe large amounts of alcohol (power drinking) during a short period. These crowds of patrons leaving licensed establishments at closing times then become involved in increased levels of intentional and unintentional injuries and other types of damage.

This hypothesis has often been cited as evidence that closing hours of licensed establishments should be less restricted as a way to reduce alcohol-related problems (Chikritzhs et al., 2002; Ragnarsdottir et al., 2002). Indeed, the legislation extending Ontario’s drinking hours was predicated on this hypothesis that there would be less neighborhood disruption as patron exodus from establishments would occur across a longer period and a lower likelihood of patrons “loading up” at last call (Liquor Licence Board of Ontario, 1995).

The evidence

Although research on hours and days of service is limited, Smart (1980) noted that legislators manipulate days and hours of sale/service more than any other control measure. Various jurisdictions have recently reviewed extended drinking hours policies (e.g., Drummond, 2000; Institute of Alcohol Studies, 2003; Jang, 2002; Strategic Task Force on Alcohol, 2002). As reviewed in Vingilis et al. (2005), most studies on the effects of extended hours of service have been conducted primarily in Australia and the United Kingdom and have found mixed results. Few studies have examined the effects on injuries presenting to trauma units.

Graham et al. (1998) examined the effect of restricting extensions to permitted licensing hours on the incidence of alcohol- or assault-related presentations to an inner-city emergency department in the United Kingdom. Prospective data were collected on emergency department presentations between 5 PM and 9 AM for 2 weeks before the introduction of the restriction, 2 weeks immediately after the restriction, and 5 weeks after the restriction. More than 56% of patients provided a breath sample, and 28.9% were positive for the presence of alcohol. The majority of assault cases who were tested were alcohol positive, but no significant pattern of alcohol- or assault-related presentations followed the restrictions. However, the study suffered from a number of methodological limitations, such as lack of a concurrent control group.

Voas et al. (2002) examined the effect of a partial sales ban in Juarez, Mexico, when bar closing time was moved to 2 AM from the previous 5 AM closing time on January 1, 1999. They found that, in 1998, the year before the policy change, 35% of motor-vehicle collision (MVC) emergency department admissions to the neighboring El Paso, Texas, hospital involved alcohol, which dropped significantly to 26% in 1999. However, time of day or day of week were not available, and the authors indicate that this reduction cannot directly be attributed to the new bar closing restrictions in Juarez.

Ragnarsdottir et al. (2002) examined the effects of extended drinking hours in Reykjavik, Iceland. Until 1999, drinking hours in licensed establishments ended at 2 AM on weekends and 11:30 PM on weekdays. However, the crowds of people leaving licensed establishments at closing time created congestion and other problems, like injuries resulting from falls or

assaults. In 1998, the Icelandic alcohol law was revised to allow unrestricted alcohol serving hours to reduce these problems.

The evaluation was conducted during eight weekends of March-April 1999 and compared with eight weekends of March-April 2000. Admissions to the emergency department increased by 20% for the weekends but decreased by 2% for weekdays; intentional and unintentional injuries to the emergency ward also increased by 34% and 23%, respectively.

The purpose of this study was to conduct an evaluation of the impact of the extended drinking hours in Ontario on persons presenting to trauma units with MVC and non-MVC injuries. We have previously reported on the impact of extended drinking hours on MVC fatalities, based on police-reported collision data, for the province of Ontario (Vingilis et al., 2005). We employed a quasi-experimental design using interrupted time series with a nonequivalent no-intervention control group. The measures examined monthly total and alcohol-related MVC fatalities for Ontario compared with neighboring regions of New York and Michigan, for the 11 PM to 3 AM time windows for 4 years before and 3 years after policy change.

No increases in alcohol-related driver fatalities were observed in Ontario after the amendment to extend drinking hours, even when controlling for overall trends in non-alcohol-related driver fatalities. However, the limited number of BAC-positive driver fatalities and the rarity of MVC fatalities may have made this data set a less sensitive measure to detect changes. Moreover, it is also possible that drinking-driving fatality rates were changing in response to several factors, including a number of road safety initiatives that occurred within a 2-year interval before and after the change in hours of sale (Boase and Tasca, 1998; Mann et al., 2000, 2002), which may have created a declining trend in the drinking-driving problem that masked the effects of a small increase in alcohol availability.

In the current study, we examine the impact of Ontario's extended drinking hours on injuries, based on the Ontario Ministry of Health Trauma Registry data, and we disaggregate injuries by MVC injuries and non-MVC injuries. Because injuries are more common than fatalities, a larger sample should be available. Furthermore, because increased alcohol consumption can lead to other types of injuries (e.g., falls, assaults), the analysis of trauma data could capture effects of extended drinking hours on non-MVC injuries. Finally, by examining non-MVC injuries in comparison with MVC injuries, it is possible to assess whether road safety initiatives could have been a possible factor in the lack of pre-post effects found for MVC fatalities when the drinking hours were extended in Ontario.

Hypotheses of impact of extended drinking hours in Ontario

Two competing hypotheses were tested: (1) availability theory and (2) the power-drinking hypothesis. Specifically, availability theory predicts that an extended drinking hour would increase alcohol consumption and lead to an overall increase in injuries. Evening injuries should increase and shift by 1 hour. The power-drinking hypothesis posits that the former 1 AM closing encouraged "loading up on the last call." This should lead to a large number of impaired patrons leaving after the establishment closed. The government advocated the extension of drinking hours as a way of extending the same quantity of drinking over an extra hour, thereby reducing the 1 AM exodus of patrons from licensed establishments. This hypothesis would thus predict a decrease in injuries for the 1–2 AM periods and no change for the other times.

Method

The single-payer, universal health care system in Canada provides for a centralized repository of health information. All hospitals must collect and forward information to the provincial

Ministry of Health on all hospitalizations, physicians' services, and so on. One such data set is the Ontario Trauma Registry Comprehensive Data Set, which consists of detailed information on patients hospitalized with injuries from 11 Ontario designated regional trauma units. The sample selected for study was trauma admissions between May 1, 1992, and April 31, 1999. The sample was disaggregated by cause of injury into MVC injuries and non-MVC injuries, which included injuries from bicycling, falls, gunshots, stabbings, burns, drowning, and other incidents but excluding work-related injuries. Trauma admissions that occurred more than 6 hours following the injury incident were excluded from analyses, as were those cases whose incident time was before 11:00 PM or after 3:00 AM.

To examine changes in trends in relation to the extended drinking hours policy, the data sets for the evaluation are monthly MVC and non-MVC injuries for the 11:00–11:59 PM (denoted as 11 PM–12 AM), 12:00–12:59 AM (12–1 AM), 1:00–1:59 AM (1–2 AM), and 2:00–2:59 AM (2–3 AM) time windows for 4 years before (May 1992 to April 1996) and 3 years after (May 1996 to April 1999) the policy change in Ontario.

Statistical time series analyses

The MVC and non-MVC injury trauma data sets were aggregated into monthly counts according to hour (four groupings between 11 PM and 3 AM), generating four time series for each data set. Following exploratory analyses, the simple step intervention model (Box and Tiao, 1975) was fitted to test statistically for the presence of shifts in the level of the time series. This model may be written:

$$[z.sub.t]=c+g([x.sub.t])+[I.sub.t]+[N.sub.t]$$

where

* $[z.sub.t]$ denotes the observed time series value corresponding to the t th observation number,

* c is the constant term,

* $g([x.sub.t])$ is a term involving a linear function or a transfer function of one or more covariate time series,

* $[I.sub.t]$ represents the intervention term, and

* $[N.sub.t]$ represents the error or disturbance term assumed to follow an ARIMA (autoregressive integrated moving average) or SARIMA (seasonal autoregressive integrated moving average) time series model.

For the simple step intervention model, we may write:

$$[I.sub.t]=[\omega][S.sub.t.sup.(T)]$$

where

* [MATHEMATICAL EXPRESSION NOT REPRODUCIBLE IN ASCII]

* T is the time the effect of the intervention starts, which in this case is the observation number corresponding to May 1996, and

* $[\omega]$ is the parameter that determines the effect of the intervention.

In fitting this model, a suitable model for the noise term can be identified by examining the pre-intervention series or by following a two-stage identification process (Hipel and McLeod, 1994). In the two-stage process, the model is initially assumed to be white noise, or, in other

words, [N.sub.t] is assumed to be normally distributed and statistically independent. After the model is fit, plots of the residual autocorrelation function are examined to check for possible autocorrelation. If autocorrelation is found, then a suitable model is determined for [N.sub.t], and the model is refit using maximum likelihood estimation. In most cases, our analysis identified the term [N.sub.t] as white noise; therefore, linear regression analysis could be used. Because it was found that there was no significant autocorrelation present in the injuries series, models assuming independence can be used.

Results

MVC and non-MVC injuries

Trauma admissions data for Ontario from May 1, 1992, to April 30, 1999, were aggregated to a monthly level for a total of 84 consecutive observations. The focus of the analyses was on determining if a change occurred after the introduction of the extended drinking hours, effective May 1, 1996, the 49th observation.

Data were disaggregated to examine changes for the individual hours between 11 PM and 3 AM to determine if the data were the result of shifts in peak late evening MVC and non-MVC injuries from the 1–2 AM to the 2–3 AM time windows commensurate with the introduction of the extended drinking hours or to changes during other time windows.

The MVC injuries comprised 1,094 cases for the 11 PM–3 AM period. A significant decrease, displayed in Figure 1, was found commensurate with the introduction of the extended drinking hours for the 11 PM–12 AM period ($p = .019$) and for the 1–2 AM period ($p = .001$), but no other periods showed significant pre-post differences.

The non-MVC injuries comprised 765 cases for the 11 PM–3 AM period. As shown in Figure 2, a significant increase was found after the extended drinking hours was introduced for the 2–3 AM period ($p = .027$). No other periods showed any pre-post changes.

Discussion

These findings, based on hospital trauma data, suggest different trends for the MVC and non-MVC injuries. The non-MVC injury data are supportive of availability theory, because an increase in injuries was found for the period during which the drinking hours were extended and no decreases were found for the other periods that would be supportive of the power-drinking hypothesis. The data for the MVC injuries, on the other hand, showed decreasing trends for 11 PM–12 AM and 1–2 AM periods, which are consistent with the results from the MVC police report fatality data (Vingilis et al., 2005).

That both the MVC injury and non-MVC injury data sets showed different trends suggests that the lack of increased MVC fatalities in the Vingilis et al. (2005) study commensurate with the extension of the drinking hours regulation may have been the result of the insensitivity of the MVC fatality data to detect changes. It is also possible that drinking-driving fatality and injury rates were changing in response to road safety initiatives, such as the Administrative Licence Suspension Law introduced in 1994 and a Graduated Licensing Law introduced at the end of 1996 (Boase and Tasca, 1998; Mann et al., 2000, 2002), which may have created a declining trend in the drinking-driving problem that masked the effects of a small increase in alcohol availability. Indeed, initial time series analyses of the MVC drinking-driving fatality data, which modeled in the Administrative Licence Suspension Law and the Graduated Licensing Law, did find an effect for the Administrative Licence Suspension Law but not the Graduated Licensing Law, possibly because the latter coincided too closely with the extended drinking hours policy change for a distinct statistical effect to be found.

A survey of licensed establishments, reported by Vingilis et al. (2005), suggested that some licensed establishments did not implement the extended drinking hours. Instead, the hours of closing were quite variable among licensed establishments across Ontario. Of the 17% of licensed establishments that were bars and taverns, about 45% remained open until 2 AM Sunday through Wednesday nights, two thirds reported remaining open until 2 AM on Thursday, and somewhat more than four fifths reported staying open until 2 AM on Friday and Saturday. Other types of licensed establishments, such as restaurants, were much less likely to stay open until 2 AM. This would suggest that alcohol availability might not have increased greatly despite the regulation change. However, a low response rate of licensed establishments to the survey limits the generalizability of these findings.

Yet Vingilis et al. (2006) also found support for availability theory with evidence of increased alcohol-related casualties, based on police MVC reporting forms. They examined the impact of extended drinking hours on cross-border drinking of Windsor, Ontario, and Detroit, MI, where the closing hours in Windsor became the same as in Detroit.

In Windsor, a region with a high licensed-establishment density, a significant increase was found in alcohol-related MVC casualties after the drinking hours were extended. However, the Detroit region showed a significant decrease in alcohol-related MVC casualties concomitant with Ontario's drinking-hour extension. No similar trends were found for the province of Ontario and the state of Michigan as a whole. Moreover, a decreasing trend was found for MVC casualties involving vehicles with Ontario licence plates in the Detroit region, suggesting that persons from Windsor were less likely to cross the border for an extra hour of drinking when the drinking period was extended in Ontario.

The different patterns found for non-MVC and MVC injuries in the current study may reflect a Canadian attitude change that impaired driving has become unacceptable (Sauve, 1999), and many patrons of licensed establishments may not be driving to licensed establishments. Yet heavy imbibing may still have consequences, such as assaults and other types of injuries.

Two recent newspaper and magazine articles from two Ontario cities provide some anecdotal evidence of potential differential impact of extended drinking hours on alcohol-related harms related to licensed establishments. Balkissoon (2007) wrote in a cover story in a Toronto, Ontario, magazine:

The crowd stretches the length of Richmond Street from Peter to Simcoe, full of attitude and soaked in booze. It's 2:30 a.m. and although the clubs are closing their doors nobody wants to go home.... A cabbie waits after his wobbly fare plops down on the pavement instead of in the back seat.... One group of partiers tries, unsuccessfully, to thread through another group holding court on Peter Street. Shoulders bump, slurred swear words are exchanged, there is some pushing, and suddenly a pile of boys are rolling around on the pavement, making mean faces and throwing punches.... On Saturdays at about 11 p.m., lines of yellow school buses pull into the club district from universities and colleges across the GTA [Greater Toronto Area]. Scores of private companies also provide group transportation. Vaughan-based Book Me Limo, for example, shuttles hundreds of partiers to clubland every weekend from Hamilton, Oakville and Mississauga.... But not everyone goes home the way they came.... In 2006, the police laid 448 people in the district with assault; 17 were additionally charged with aggravated assault--a beating causing serious bodily harm. (pp. 46-47)

Similarly, Morgan (2007) wrote in a London, Ontario, newspaper:

He [Valente, owner of Eastside Bar and Grill] also shared the opinion of the downtown club owner that the main problem is not so much student drinking, but the extended

bar hours which came into effect in 1996, changing closing time from 1:00 am to 2:00 am. "Having the province pushing bar hours back makes no sense," said Valente. Closing time aside, behavioural problems associated with student drinking have long been a concern for local authorities.... [T]he downtown club owner told Scene, "I never had any fights (in my bar) until eight years ago" (p. 4).

These anecdotes point to a variety of alcohol-related harms that have been observed and suggest that it would be important to conduct further research on extended drinking hours to examine the impact on other harms, such as crime (e.g., assaults or impaired driving) and other indicators of neighborhood disruption.

That said, several recent studies have observed that small changes in availability may not always produce large or clear effects on consumption or problem measures (Antalova and Martinic, 2005). Availability theory literature indicates that factors affecting aggregate alcohol consumption are strongly related to availability factors only when other conditions remain unchanged (Antalova and Martinic, 2005; Room et al., 2002; Skog, 1990, 2003).

Availability factors are mediated by a host of other factors, such as prevailing drinking practices; the role of alcohol in a given society; and other cultural, political, and legal norms (Antalova and Martinic, 2005). The findings of the different studies on the impact of extended drinking hours support a complex pattern of outcomes, whereby, in Ontario as a whole, there seems to be no perceived increase in alcohol-related, police-reported MVC casualties (Vingilis et al., 2005) or hospital-reported MVC injuries, although in the high-alcohol-density area of Windsor, Ontario, increases were found in alcohol-related, police-reported MVC casualties (Vingilis et al., 2006), and for Ontario as a whole, increases in non-MVC hospital-reported injuries were found for the period during which the drinking hour was extended. Thus, the change in policy, the limited implementation, and other societal factors such as economic conditions and road safety countermeasures may have mediated the effects of the extended drinking hours on MVC injuries but not on non-MVC injuries, such as falls and assaults, in Ontario.

References

- ANTALOVA, L.; MARTINIC, M. Beverage Alcohol Availability Controls. Washington, DC: International Center for Alcohol Policies; Sep. 2005 (available at: www.icap.org/Portals/0/download/all_pdfs/ICAP_Reviews_English/review1.pdf)
- BALKISSOON D. Party Monsters. *Toronto Life* 2007;41(8):44–51.
- BOASE, P.; TASCA, L. Graduated Licensing System Evaluation: Interim Report '98. Toronto, Canada: Safety Policy Branch, Ministry of Transportation Ontario; 1998.
- Box GEP, TIAO GC. Intervention analysis with applications to economic and environmental problems. *J Amer Stat Assoc* 1975;70:70–79.
- CHIKRITZHS, T.; STOCKWELL, T.; MASTERS, L. Evaluation of the Public Health and Safety Impact of Extended Trading Permits for Perth Hotels and Nightclubs. Perth, Western Australia, Australia: National Drug Research Institute, National Centre for Research into the Prevention of Drug Abuse, Curtin University of Technology; 1997.
- DRUMMOND DC. UK government announces first major relaxation in the alcohol licensing laws for nearly a century: Drinking in the UK goes 24-7. *Addiction* 2000;95:997–998. [PubMed: 10962765]
- FOSTER JH. Extended alcohol licensing hours in England and Wales: There will be a large price to pay. *Drugs Educ Prev Policy* 2003;10:285–287.
- GRAHAM CA, MCLEOD LS, STEEDMAN DJ. Restricting extensions to permitted licensing hours does not influence the numbers of alcohol or assault related attendances at an inner city accident and emergency department. *J Accid Emer Med* 1998;15:23–25.
- GRUBE JW, STEWART K. Preventing impaired driving using alcohol policy. *Traffic Injury Prev* 2004;5:199–207.

- HIPEL, KW.; MCLEOD, AI. Time Series Modelling of Water Resources and Environmental Systems. New York: Elsevier; 1994.
- INSTITUTE OF ALCOHOL STUDIES. Proposed Changes to the Liquor Licensing Legislation to Extend Permitted Hours on Friday and Saturday Night. London, England: Institute of Alcohol Studies; 2002. (available at: www.ias.org.uk/resources/papers/licensing_exhrs.pdf)
- JANG, B. 4 a.m. Closing Time Begins in December. The Globe and Mail, p. A6, August 13th, 2002.
- LIQUOR LICENCE BOARD OF ONTARIO (LLBO). Minister's Briefing Note: Extended Hours, December 18, 1995. Toronto, Canada: Liquor Licence Board of Ontario; 1995.
- MANN RE, SMART RG, STODUTO G, ADLAF EM, VINGILIS E, BEIRNESS D, LAMBLE R. Changing drinking-and-driving behaviour: The effects of Ontario's administrative driver's licence suspension law. Can Med Assoc J 2000;162:1141–1142. [PubMed: 10789629]
- MANN RE, SMART RG, STODUTO G, BEIRNESS D, LAMBLE R, VINGILIS E. The early effects of Ontario's administrative driver's licence suspension law on driver fatalities with a BAC > 80 mg %. Can J Publ Hlth 2002;93:176–180.
- MORGAN C. Reduced Student Business Hurts Local Bars. Scene 2007;546:4.
- NORSTROM T, SKOG O-J. Saturday opening of alcohol retail shops in Sweden: An experiment in two phases. Addiction 2005;100:767–776. [PubMed: 15918807]
- RAGNARSDOTTIR, P.; KJARTANSDDOTTIR, A.; DAVIOSDDOTTIR, S. Effect of extended alcohol serving-hours in Reykjavik. In: ROOM, R., editor. The Effects of Nordic Alcohol Policies: What Happens to Drinking and Harm When Alcohol Controls Change? NAD Publications, No. 42. Helsinki, Finland: Nordic Center for Alcohol and Drug Research; 2002. p. 145-154.
- ROOM R. The dialectic of drinking in Australian life: From the rum corps to the wine column. Aust Drug Alcohol Rev 1988;7:413–437.
- ROOM R, BABOR T, REHM J. Alcohol and public health. Lancet 2005;365:519–530. [PubMed: 15705462]
- ROOM, R.; ROMELSSJO, A.; MAKELA, P. Impacts of alcohol policy: The Nordic experience. In: Room, R., editor. The Effects of Nordic Alcohol Policies. What Happens to Drinking and Harm When Alcohol Controls Change? NAD Publications, No. 42. Helsinki, Finland: Nordic Center for Alcohol and Drug Research; 2002. p. 167-174.
- RUSH BR, GLIKSMAN L, BROOK R. Alcohol availability, alcohol consumption and alcohol-related damage: I. The distribution of consumption model. J Stud Alcohol 1986;47:1–10. [PubMed: 3485738]
- SAUVE, J. Juristat. 19. Ottawa, Canada: Canadian Centre for Justice Statistics, Statistics Canada; 1999. Impaired driving in Canada--1998. (available at: www.statcan.ca/bsolc/english/bsolc?catno=85-002-XI9990118305)
- SKOG OJ. Future trends in alcohol consumption and alcohol-related problems: Anticipations in light of the efforts at harmonization in the European Community. Contemp Drug Probl 1990;17:575–593.
- SKOG OJ. Alcohol consumption and fatal accidents in Canada, 1950–98. Addiction 2003;98:883–893. [PubMed: 12814494]
- SMART, RG. Availability and the prevention of alcohol-related problems. In: HARFORD, TC.; PARKER, DA.; LIGHT, L., editors. Normative Approaches to the Prevention of Alcohol Abuse and Alcoholism. NIAAA Research Monograph No. 3, DHEW Publication No. (ADM). Washington: Government Printing Office; 1980. p. 79-847.p. 123-146.
- STRATEGIC TASK FORCE ON ALCOHOL. Strategic Task Force on Alcohol--Interim Report. Dublin, Ireland: Department of Health and Children; 2002. (available at: www.dohc.ie/publications/strategic_task_force_on_alcohol_interim.html/)
- VINGILIS E, LOVE R, SEELEY J. Are trade agreements and economic cooperatives compatible with alcohol control policies and injury prevention? Contemp Drug Probl 1998;25:579–620.
- VINGILIS E, MCLEOD AI, SEELEY J, MANN RE, STODUTO G, BEIRNESS D, COMPTON CP. Road safety impact of extended drinking hours in Ontario. Accid Anal Prev 2005;37:549–556.
- VINGILIS E, MCLEOD AI, SEELEY J, MANN R, VOAS R, COMPTON C. The impact of Ontario's extended drinking hours on cross-border cities of Windsor and Detroit. Accid Anal Prev 2006;38:63–70. [PubMed: 16169506]

VOAS RB, LANGE JE, JOHNSON MB. Reducing high-risk drinking by young Americans south of the border: The impact of a partial ban on sales of alcohol. *J Stud Alcohol* 2002;63:286–292. [PubMed: 12086129]