

The impact of Ontario's extended drinking hours on cross-border cities of Windsor and Detroit

E. Vingilis^{a,*}, A.I. McLeod^b, J. Seeley^a, R. Mann^c, R. Voas^d, C. Compton^e

^a Population & Community Health Unit, Department of Family Medicine, The University of Western Ontario, 100 Collip Circle, Suite 245, London, Ont., Canada N6G 4X8

^b Statistical & Actuarial Sciences, Western Science Centre, The University of Western Ontario, London, Ont., Canada N6A 5B9

^c Centre for Addiction and Mental Health, 33 Russell Street, Toronto, Ont., Canada M5S 2S1

^d Pacific Institute for Research & Evaluation, 11710 Beltsville, MD 20785-3102, USA

^e Transportation Data Center, Transportation Research Institute, University of Michigan, 2901 Baxter Road, Ann Arbor, MI 48109-2150, USA

Received 26 April 2005; received in revised form 30 June 2005; accepted 30 June 2005

Abstract

Purpose: This study evaluated the cross-border safety impact of extended drinking hours from 1:00 to 2:00 a.m., in licensed establishments in Ontario, Canada.

Methods: This study examined patterns in total and alcohol-related casualties in: (1) Windsor, Ontario, Canada compared to Detroit, Michigan, US with a 2:00 a.m. closing time, and (2) Ontario compared to Michigan for overall trends. The criterion outcome indicators were: (1) monthly motor vehicle casualties (major injuries and fatalities) for the city-regions of Windsor and Detroit and (2) Ontario and Michigan monthly motor vehicle fatalities occurring between 11:00 p.m. and 3:00 a.m. for 4 years pre- and 3 years post-policy change. In order to examine cross-border drinking consequences, data were disaggregated to assess trends of motor vehicle injury collisions involving vehicles with US licence plates and with US drivers aged 16–20 in the Windsor region; similarly trends were assessed for motor vehicle injury collisions involving vehicles with Ontario licence plates in the Detroit region.

Results: The Windsor region total motor vehicle casualty data showed a non-significant pre–post increase, while the Detroit region showed a statistically significant decrease for total motor vehicle casualties. In the Windsor region, a significant increase was found for alcohol-related motor vehicle casualties after the drinking hours were extended. However, the Detroit region showed a statistically significant decrease in alcohol-related motor vehicle 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 significant decrease was found for injury collisions involving vehicles with Ontario licence plates in the Detroit region but no similar pattern was found for injury collisions involving vehicles with US licence plates and with 16–20-year-old US drivers in the Windsor region.

Discussion: These data seem to support a cross-border impact of the Ontario extended drinking policy. A significant increase in alcohol-related motor vehicle casualties was found in the Windsor region and concomitantly, significant decreases in total and alcohol-related motor vehicle casualties were found in the Detroit region after the extended drinking hours amendment. The Ontario government's belief that the extended drinking hour policy would “reduce the number of patrons who cross the border when Ontario's bars and restaurants close” may have been realized.

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Keywords: Drinking hours; Drinking driving; Motor vehicle casualties; Motor vehicle collisions; Alcohol policy; Cross-border drinking

1. Introduction

On 1 May 1996, the provincial government of Ontario amended the *Liquor Licence Act* to extend hours of alcohol sales and service in licensed establishments from 1:00 to 2:00 a.m. The governmental rationale for extending the

* Corresponding author. Tel.: +1 519 858 5063x2; fax: +1 519 858 5029.
E-mail addresses: evingili@uwo.ca (E. Vingilis), aim@stats.uwo.ca (A.I. McLeod), jsseeley@uwo.ca (J. Seeley), Robert.Mann@camh.net (R. Mann), voas@pire.org (R. Voas), ccompton@umich.edu (C. Compton).

drinking hours was as follows: “We believe that permitting licensed establishments to sell and serve alcohol to 2:00 a.m. will help the tourism and convention industry and the hospitality industry, which loses business when patrons go over the border into New York or Michigan and into Manitoba or Quebec, when Ontario bars and restaurants close. . . Ontario has the earliest hours in Canada and in American states bordering Ontario and we believe this change will reduce the number of patrons who cross the border when Ontario’s bars and restaurants close” (The Honourable Norman Sterling, Minister of Consumer and Commercial Relations, 1996). This amendment made the 2:00 a.m. closing hour consistent with the cross-border jurisdiction of Michigan.

However, Canada’s lower minimum drinking age when compared to the US is an alcohol control policy difference that could encourage US residents to cross the border to drink in Ontario. The minimum drinking age in Ontario is 19 while in all American states it is 21 years of age. An unintended consequence of extending drinking hours in Ontario could be increased availability of alcohol for underage US patrons who cross the border to legally consume alcohol in Canada. The present study aims to examine the effect of the extended drinking hours on the cross-border regions of Windsor and Detroit.

1.1. Hours of sale

As reviewed in Vingilis et al. (2005), most studies on the effects of extended hours of sale have been conducted primarily in Australia and the United Kingdom who have found mixed results. The only recent Ontario evaluation of hours of sale was conducted by Vingilis et al. (2005) who examined the impact of extended drinking hours for the province of Ontario using an interrupted time series, quasi-experimental design with non-equivalent no-intervention control groups. The analyzed data sets were total and alcohol-related, monthly traffic fatalities for Ontario compared to neighbouring regions of New York and Michigan, for the 11:00 p.m. to 4:00 a.m. time windows, for 4 years pre- and 3 years post-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. These findings were supported by data obtained from a survey of licensed establishments conducted as part of this evaluation, which indicated that many licensed establishments did not implement the extended drinking hours and indeed the hours of closing were quite variable among licensed establishments across Ontario.

1.2. Cross-border drinking

To date, only one unpublished study has investigated the impact of cross-border drinking in the Canadian/US context. Krefth (2002) examined the impact of the difference in Michigan and Ontario minimum drinking age laws on the occurrence of motor vehicle fatalities in the Michigan coun-

ties that are nearer to Ontario border crossings for 19–20 years old drivers and drivers of all ages. He found that the closer a Michigan county is to a border crossing, the higher the total and alcohol-related motor vehicle fatalities for all ages of drivers. A larger body of literature has emerged which has examined cross-border drinking in the US/Mexican context. The research indicates that this border region has widely established and problematic alcohol-related behaviours among young adults (Clapp et al., 2001; Lange et al., 1999; Lange and Voas, 2001; Voas et al., 2002a, 2002b). Specifically, an estimated 1000 US San Diegans return from Tijuana, Mexico, every hour between midnight and 5:00 a.m. after drinking (Baker et al., 2000). Tijuana’s popularity is a result of its lower legal drinking age, fewer restrictions on alcohol sales, lower alcohol prices and less law enforcement than is present in the US (Baker et al., 2000). While Mexico does not provide an example of an increase in the hours of sale, the border surveys did demonstrate the impact upon cross-border drinkers of reducing the drinking hours. Voas et al. (2002a), reported a policy change in Juarez, Mexico, across the border from El Paso, US. On 1 January 1999, the all night bars in Juarez were required to close at 2:00 a.m. This resulted in an overall drop in cross-border drinkers: a 92% reduction in the number of cross-border drinkers returning with BACs above .08 after 3:00 a.m. and only a small non-significant reduction in those returning before 3:00 a.m.

Thus, while these findings suggest that in Mexico, cross-border drinking is strongly affected by availability and results in considerable alcohol-related harm, cultural differences between Canada and Mexico preclude firm comparisons regarding whether cross-border drinking is as widespread or problematic in the US/Canadian context. For example, Kuo et al. (2002), comparing college alcohol use in Canada and the US, found that more Canadian (legal drinkers) students drink, but US (illegal drinkers) students drink more; that is, prevalence of life-time and past-year alcohol use was significantly higher among Canadian students than US students but the prevalence of heavy drinking (consuming five or more drinks in a row) was significantly higher for US than Canadian students. Possibly the drinking context in Canadian licensed establishments reduce the incentive for heavy, binge drinking among Canadian students.

The introduction of extended drinking hours provided a natural experiment to evaluate an important alcohol control policy. This cross-border study was part of a larger study investigating the impact of the extended hours amendment in Ontario. Specifically, this study tested whether there was a change in alcohol-related motor vehicle casualties in Windsor and Detroit concomitant with the extended drinking hour amendment. Windsor within the county of Essex, Canada’s southernmost city with a regional population of about 300,000 is situated on the south shore of the Detroit River and Lake St. Clair, at the centre of the Great Lakes basin and directly across from Detroit, Michigan with a regional population of about 5 million. Although the Windsor region

has a smaller population than the Detroit region, both communities are major automotive industrial cities. The regions also include significant universities and colleges. The busiest Canada–US vehicular traffic border crossings are the Ambassador Bridge and the tunnel between Windsor and Detroit, with over 16 million vehicles crossing the Windsor–Detroit border every year (Transport Canada, 2004).

The Windsor–Detroit region was chosen for study because of documented problems of cross-border drinking. As described on the Ontario Alcohol Policy Network (APOLNET) website:

Large numbers of young Windsorites cross the border for entertainment at US bars where cheaper drinks are served. Similarly, large numbers of young Americans under 21 years of age crossing [*sic*] the border to Windsor to take advantage of the lower drinking age. The tremendous amount of cross-border “partying” has resulted in the development of an entertainment strip in the downtown area of Windsor with at least six bars catering to a young US clientele. Noise and anti-social behaviour by intoxicated patrons in this retail strip has disrupted the lives of apartment dwellers—many of them seniors and occupants of residences on adjacent streets (p. 1).

Additionally, numerous media articles on both sides of the border, including university newspapers, have described the cross-border, drinking nightlife (e.g. Donnelly, 2002; Foley, 2005; Morse, 1998). For example, Morse (1998) wrote in the Michigan State University newspaper, “Sgt. Rossell said the Windsor police try to stop as many drunken drivers heading for the border as possible, but added some still elude authorities” (p. 1). Thus, because of the historical concern with “cross-border partying”, this study wanted to assess the impact of the extended drinking hour amendment in this region.

2. Methods

2.1. Conceptual framework

This study used a quasi-experimental comparison time series design to assess cross-border impact. Although the Ontario government hypothesized that their policy change should reduce the cross-border drinking of Windsor patrons, it is unclear conceptually from their documents what safety impact this would have on the region. Quite possibly this extra hour of drinking could lead to increased drinking as one argument in favour of extending drinking hours was increased licensee revenues (LLBO, 1995). This, in turn, could lead to increased alcohol-related motor vehicle casualties in Windsor and decreased alcohol-related motor vehicle casualties in Detroit, since licensed establishments close at 2:00 a.m. in Detroit and there would be no extra drinking time gained from crossing from Windsor to Detroit. However, other governmental arguments in favour of extending the drinking hours were that there would be less neighbourhood disruption as

patron exodus from establishments would occur over a longer time period, and less likelihood of patrons “loading up” on last call (LLBO, 1995). This could then lead to a reduction of alcohol-related motor vehicle casualties in Windsor.

This study examined patterns in total and alcohol-related casualties in: (1) Windsor compared to Detroit, and (2) Ontario compared to Michigan for overall trends. The criterion outcome indicators were: (1) monthly motor vehicle casualties for the city-regions of Windsor, Ontario (Essex county) and Detroit, Michigan, (Macomb, Oakland and Wayne counties) and (2) Ontario and Michigan monthly motor vehicle fatalities occurring between 11:00 p.m. and 3:00 a.m. for 4 years pre- and 3 years post-policy change. The outer borders of the counties of Essex, Macomb, Oakland and Wayne are within a 1 h or less drive to the border.

2.2. Motor vehicle casualties

Total casualties (fatalities and major/incapacitating injuries) during the 11:00 p.m. to 3:00 a.m. time windows for Windsor and Detroit regions were used for city-region analyses because not enough fatalities occurred in Windsor during the time windows. “Major” injuries within the Ministry of Transportation of Ontario (MTO) database are defined as “a non-fatal injury severe enough to require that the injured person be admitted to hospital, even if for observation only” (MTO, 1996) and “incapacitating” injuries within the Fatal Analysis Reporting System (FARS) and Michigan State Police Database are defined as: “An incapacitating injury is any injury, other than a fatal injury which prevents the injured person from walking, driving or normally continuing the activities the person was capable of performing before the injury occurred” (NSC, 1996). The time window of 11:00 p.m. to 3:00 a.m. was chosen because Ontario data indicated that before drinking hours were extended, two peaks in alcohol-related fatalities occurred between 11:00 p.m. to 12:00 a.m. and between 1:00 a.m. to 2:00 a.m. when licensed establishments historically had closed at 1:00 a.m. (MTO, 1995). Thus, it was important to capture the two previous peak periods and the additional hour after closure.

The MTO database is generated from the standardized Motor Vehicle Accident Reporting Forms that are used province-wide by all police forces. These data are cross-checked with other data gathered by different systems. For example, the driver fatalities and major injuries data from police accident reports are checked against hospital and coroner’s data to ensure accuracy and completeness. Collisions are categorized as alcohol-related when under driver condition the collision is coded as one of the following: “had been drinking”, “over 80 mg/100 ml” or “ability impaired”. For the MTO database, the definition of a fatality is a person killed immediately or within 30 days of the motor vehicle collision. The Michigan State Police database on police-reported driver casualties is generated from UD-10 that is used state-wide by all forces. The Michigan State Police gather all crash reports

from all forces within Michigan. Collisions are categorized as alcohol-related when the collision is coded “yes” under the “alcohol” condition which reflects the officer’s opinion that drinking had been involved. Fatalities are reported to and checked by FARS who in turn notify Michigan of any errors. The FARS database on police-reported fatal motor vehicle collisions is gathered from states owned source documents and is coded on standard FARS forms. To be included in FARS a crash must involve a motor vehicle travelling on a traffic way customarily open to the public and result in the death of a person (either vehicle occupant or non-motorist) within 30 days of the crash (NCSA, 2004).

2.3. Statistical analyses (time series)

The data from (1) MTO-Windsor, Ontario (Essex county), (2) MTO-Ontario, (3) Michigan State Police-Detroit, Michigan (Macomb, Oakland and Wayne counties), and (4) FARS-Michigan were aggregated into monthly counts according to hour (specifically between 11:00 p.m. and 2:59 a.m.) between 1 January 1992 and 31 December 1999 for Windsor and Ontario, and between 1 May 1992 and 30 April 1999 for Detroit and Michigan, generating two time series for each data set. Monthly data for 4 years pre-intervention and 3 years post-intervention were chosen to ensure adequate power; a sample of 84 monthly data points with the intervention month at 48 months has a 86.7% chance of detecting a step intervention whose magnitude is one standard deviation with an α of .05 (McLeod and Vingilis, 2005). As in the detailed statistical description provided in Vingilis et al. (2005), following exploratory analyses, the simple step intervention model (Aox and Tiao, 1976) was fitted to test statistically for the presence of shifts in the level of the time series. 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_t , and the model is refit using maximum likelihood estimation. In most cases, our analysis identified the term N_t as white noise so linear regression analysis could be used. For the Essex datasets it was found that the time series of monthly casualties, consisted almost entirely of very small integer values, usually zeros, ones and twos. In this case the normality assumption is not satisfied and a generalized linear model (McCullagh and Nelder, 1989) was used. Since it was found that there was no significant autocorrelation present in the MTO Essex time series, models assuming independence can be used. In some cases the data were adequately represented by the Poisson distribution while in other cases it was necessary to use a negative binomial regression (Venables and Ripley, 2002) due to over-dispersion in the data. The log link function was used. Poisson and negative binomial regression were fit using exact maximum likelihood estimation (Currie, 1995). In general, we found that these models agreed very well with the results obtained by fitting the normal linear regression model as might be expected from the robustness result of Hjort (1994).

3. Results

Windsor (1 January 1992 to 31 December 1999) and Detroit (from 1 May 1992 to 30 April 1999) regions total monthly motor vehicle casualties that occurred between 11:00 p.m. and 3:00 a.m. are presented in Fig. 1. The Windsor region total motor vehicle casualty data showed a non-significant pre–post increase ($p = .099$). By contrast, the Detroit region showed a statistically significant decrease for total motor vehicle casualties ($p = .036$). Fig. 2 shows the Windsor and Detroit regions alcohol-related motor vehicle casualty time series between 11:00 p.m. and 3:00 a.m. for the same pre- and post-intervention time periods. In the Windsor region, a significant increase was found for alcohol-related motor vehicle casualties after the drinking hours were extended ($p = .035$). However, the Detroit region showed a statistically significant decrease in alcohol-related motor vehicle casualties concomitant with Ontario’s drinking hour extension ($p < .0001$). To account for overall trends, both the province of Ontario and the state of Michigan total and alcohol-related motor vehicle fatality data between 11:00 p.m. and 3:00 a.m. were examined with time series analyses. In Ontario, no significant pre–post differences were found for total fatalities while a significant downward trend was found for alcohol-related motor vehicle fatalities ($p = .013$). In Michigan, no significant changes were found for either total or alcohol-related motor vehicle fatalities.

The Windsor region data were disaggregated by time of day (11:00 p.m. to 11:59 p.m., 12:00–12:59 a.m., 1:00–1:59 a.m. and 2:00–2:59 a.m.) in order to assess whether the previous 1:00–2:00 a.m. peak in alcohol-related injury collisions that traditionally occurred when the licensed establishments closed at 1:00 a.m. had shifted to 2:00–3:00 a.m. to coincide with the 2:00 a.m. closure. Moreover, the data were further broken down by day of week (Sunday–Wednesday and Thursday–Saturday evenings) to examine weekday versus weekend patterns as a post policy survey by the Liquor Licence Board of Ontario found that many licensed establishments in smaller communities maintained their 1:00 a.m. closing time for Sunday through Wednesday nights because of lack of sufficient business, but kept open until 2:00 a.m. on Thursday through Saturday nights (Bolton, 1996). To ensure a large enough sample size, all alcohol-related injury collisions (minimal, minor, major and fatal) were used in the analyses. Fig. 3 shows the times series for Sunday–Wednesday night 1:00–1:59 a.m. (S1) and 2:00–2:59 a.m. (S2), and Thursday–Saturday night 1:00–1:59 a.m. (T1) and 2:00–2:59 a.m. (T2).¹ For Sunday–Wednesday nights a significant decrease in alcohol-related injury collisions was found for the 1:00–1:59 a.m. time period ($p = .022$) but a significant increase was

¹ Late night, i.e. 1:00–1:59 and 2:00–2:59 a.m., Sunday–Wednesday actually represents the next day, Monday–Thursday. Similarly, late night Thursday–Saturday actually presents Friday to Sunday 1:00–1:59 and 2:00–2:59 a.m.

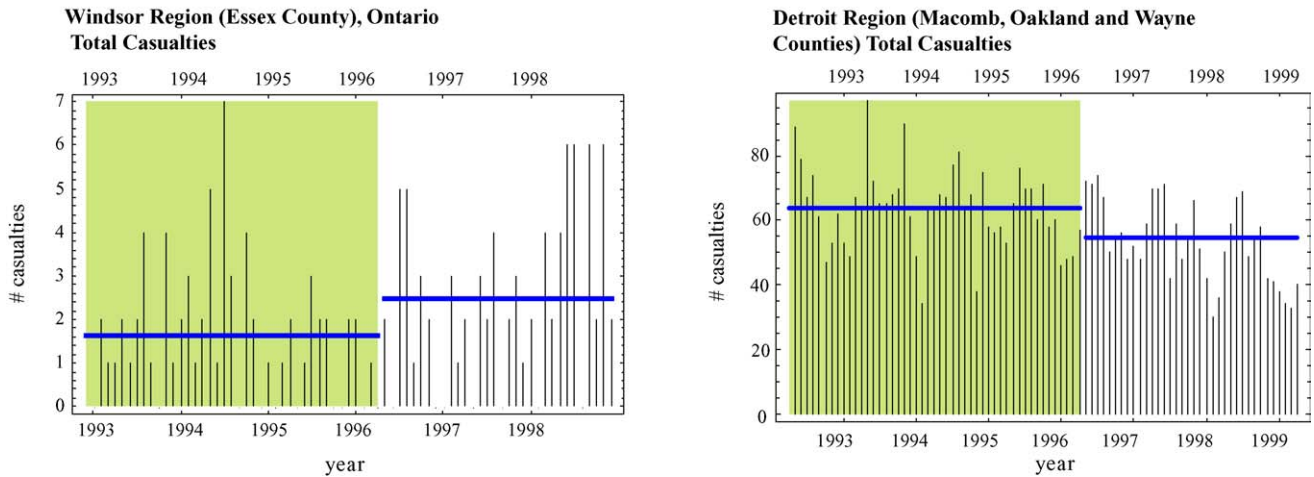


Fig. 1. Monthly Windsor and Detroit regions total motor vehicle casualties (fatalities and major/incapacitating injuries), 11:00 p.m. to 2:59 a.m., 1992–1999. The shaded area is the pre-intervention period.

found for the 2:00–2:59 a.m. time period ($p = .005$). For Thursday–Saturday nights no changes were found for either the 1:00–1:59 a.m. or 2:00–2:59 a.m. time periods, although an upward trend was observed for the 2:00–2:59 a.m. time period ($p = .133$).

To assess whether or not the significant increases in alcohol-related motor vehicle collisions in the Windsor region were partly due to fewer Ontario residents crossing the border to Detroit after the extended hours policy, the Detroit region data were disaggregated by licence plates. In order to ensure a large enough sample size, total injury collisions not disaggregated by drinking condition were used in the analyses. A total of 96 injury collisions in the Detroit region included vehicles with Ontario licence plates. The time series intervention analysis, shown in Fig. 4, indicated a significant decrease ($p = .013$) in injury collisions with vehicles with Ontario licence plates concomitant with the extended drinking hours policy.

To determine whether or not the significant increases in alcohol-related casualties in the Windsor region were partially due to more US residents, in particular underage US residents, crossing the border to Windsor after the extended hours policy, the Windsor region data were disaggregated by licence plates and by drivers aged 16–20. Similarly, to ensure a large enough sample size, total injury collisions not disaggregated by drinking condition were used in the analyses. A total of 69 motor vehicle injury collisions with US plates occurred in the Windsor region and 20 involved drivers between the ages of 16–20. Intervention time series analyses indicated no pre–post change for all injury collisions with US plates ($p = .528$). On average .769 injury collisions occurred monthly pre-intervention and .906 injury collisions occurred monthly post-intervention. When the injury collision data were further disaggregated by US drivers aged 16–20, no pre–post changes were found ($p = .542$) related to the policy change. On average .262 injury collisions among 16–20-year-

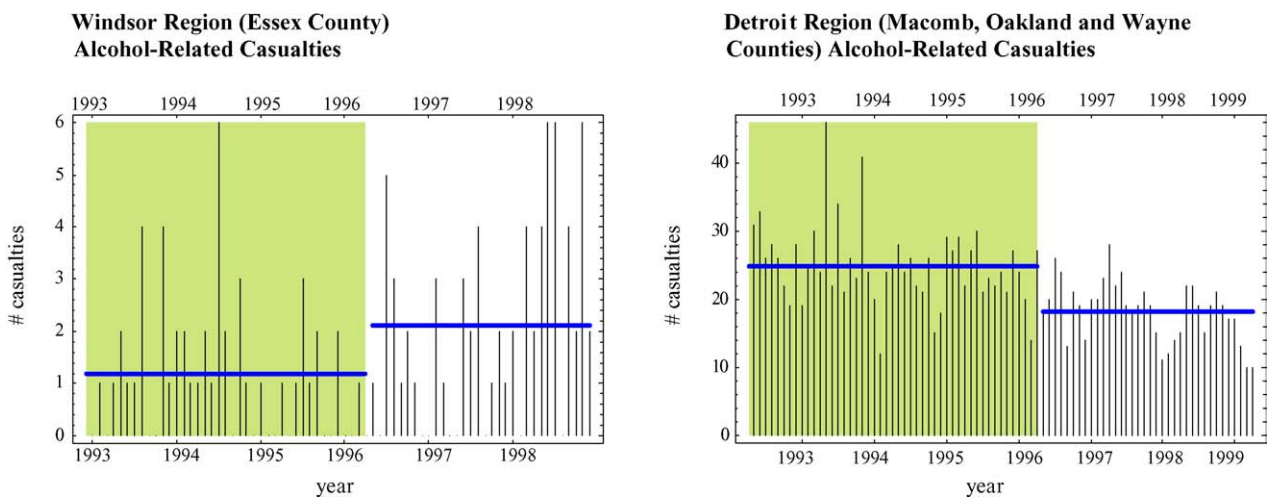


Fig. 2. Monthly Windsor and Detroit regions alcohol-related motor vehicle casualties (fatalities and major/incapacitating injuries), 11:00 p.m. to 2:59 a.m., 1992–1999. The shaded area is the pre-intervention period.

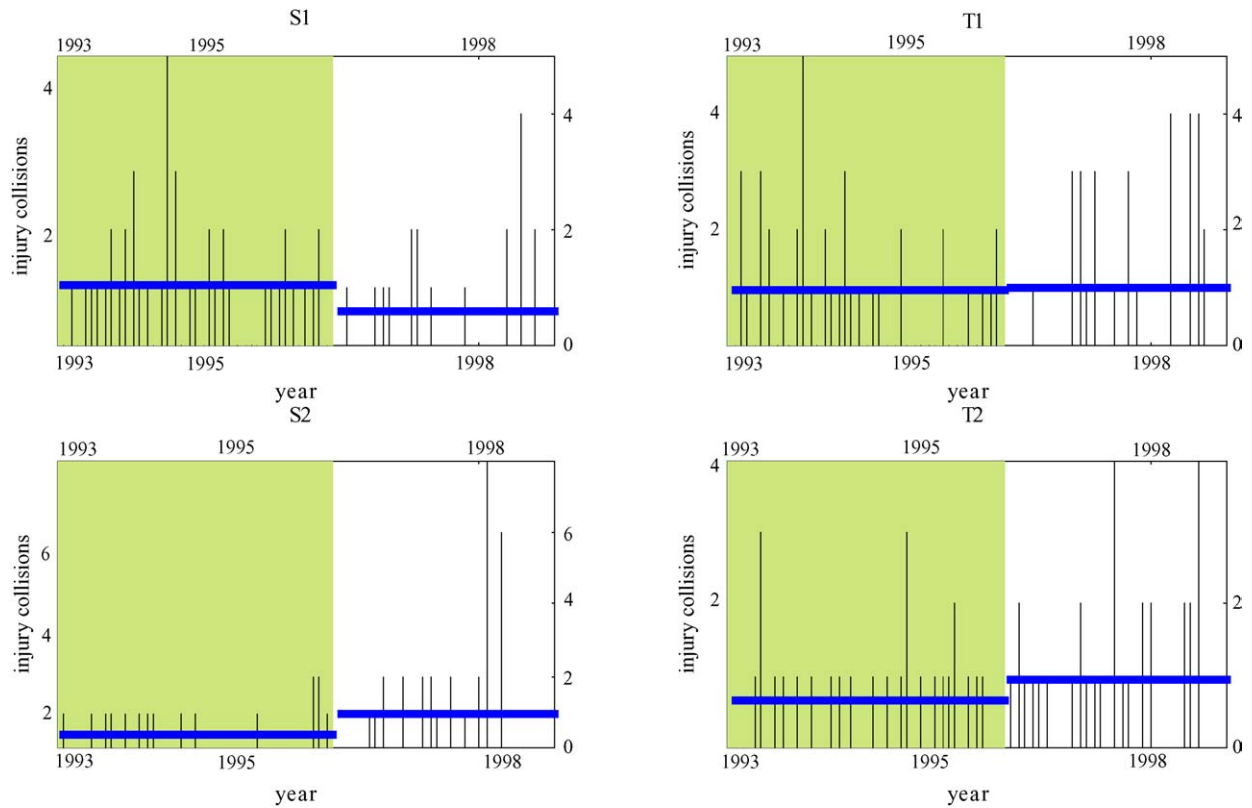


Fig. 3. Monthly Windsor region alcohol-related motor vehicle injury collisions by time of day and weekgroup, 1992–1999. S1 = Sunday–Wednesday evenings 1:00–1:59 a.m., S2 = Sunday–Wednesday evenings 2:00–2:59 a.m., T1 = Thursday–Saturday evenings 1:00–1:59 a.m., T2 = Thursday–Saturday evenings 2:00–2:59 a.m. The shaded area is the pre-intervention period.

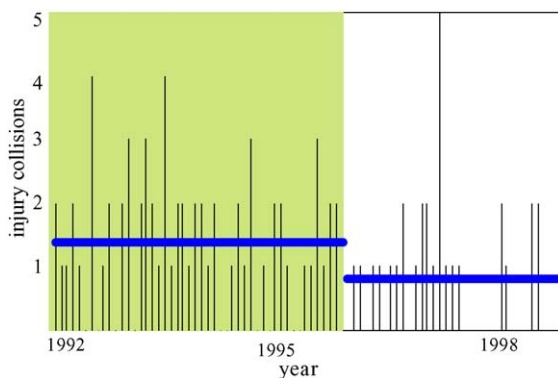


Fig. 4. Monthly Detroit region motor vehicle injury collisions (possible, non-incapacitating, incapacitating, and fatal) for drivers with Ontario licence plates, 11:00 p.m. to 2:59 a.m., 1992–1999. The shaded area is the pre-intervention period.

old US drivers occurred monthly before the policy change compared to .281 injury collisions monthly after the policy change.

4. Discussion

These data support a cross-border impact of the Ontario extended drinking policy. A significant increase in alcohol-

related motor vehicle casualties was found in the Windsor region and concomitantly, significant decreases in total and alcohol-related motor vehicle casualties were found in the Detroit region after the extended drinking hours amendment. These regional differences in total and alcohol-related motor vehicle casualties could not be attributed to overall provincial or state trends as Ontario and Michigan data showed no similar trends. A province-wide evaluation of the impact of extended drinking hours in Ontario found no significant impact on alcohol-related traffic fatalities possibly because many licensed establishments in Ontario may not have extended their drinking hours (Vingilis et al., 2005).

Moreover, when the Windsor region alcohol-related injury collisions were broken down by time and day, a significant increase in alcohol-related injury collisions was found for Sunday–Wednesday evening 2:00–2:59 a.m. and although no significant increase was found for Thursday–Saturday evening 2:00–2:59 a.m., the trend was upward. These results would suggest that not only was there an overall increase in alcohol-related motor vehicle injuries associated with the extended drinking hours policy change, but that more injury collisions occurred after the 2:00 a.m. closing.

The increased alcohol-related motor vehicle casualties in Windsor and decreased motor vehicle casualties in Detroit may be partially due to “re-patriated” Windsor drivers, since the results demonstrate a significant decrease for Ontario

drivers being involved in motor vehicle injury collisions in the Detroit region after the extension of the closing hours. Although Windsor, known for its “strip” and “multimillion dollar entertainment trade”, attracts a substantive proportion of its patrons from the Detroit region (Buss, 2002), the evidence does not suggest a statistically significant increase in motor vehicle injury collisions involving US drivers or underage US drivers related to the extended drinking hours policy. However, the small number of injury collisions involving US drivers in the Windsor region preclude firm conclusions being drawn on whether or not the policy was having an impact on Michigan patrons at Windsor’s licensed establishments, although it is interesting to note that the average pre-intervention, monthly injury collisions among US drivers (.769) increased by 17.6% after the policy change (.906), while for the 16–20-year-old US drivers (.262) they increased by 7.3% after the policy change (.281). Certainly, media reports indicate that cross-border drinking by US youth is common. As Foley (2005) writes in the Michigan State University State News:

Windsor, Ontario – Lauren Saelens and Meghan Curis were on a mission Saturday night. The mission, which they did choose to accept, was to hit up every bar they could – a classic bar crawl. Saelens, an MSU human biology major, is turning 21 this month, so it does not make much sense to her to keep travelling to Windsor to go to bars. . . they are just two of the many Michigan students who indulge in the nightlife of Windsor (p. 1).

Similarly, Morse (1998) writing in the Michigan State University State News about US students drinking in Windsor, states: “Perhaps the most dangerous trend which has developed with nomadic American drinkers is what they do when the bars close. After students and others are turned out at 2:00 a.m., most make their way to the Ambassador Bridge or Windsor Tunnel” (p. 1). Interestingly, Michigan recently introduced legislation in which under age drinkers in possession of alcohol could receive penalties of up to 30 days in jail on their second offence and a fine up to \$ 200 and a penalty up to 60 days in jail for subsequent offences unless they can prove that they legally drank their alcohol in Canada (Bailey, 2004), as a deterrent for underage drinking.

The examination of the impact of extended hours in Ontario as a whole did not find significant increases in alcohol-related fatalities, possibly because alcohol availability may not have increased generally in Ontario as a survey of licensed establishments indicated that many did not extend their drinking hours (Vingilis et al., 2005). However, in areas of high densities of licensed establishments, competition may motivate licensed establishments to extend their hour of sale. Research on alcohol outlet density and motor vehicle crashes have generally found increased crashes in regions with higher alcohol outlet densities (Gruenewald et al., 1996; Scribner et al., 1994, 2000). This may explain why province-wide no impact was found for extended drinking hours, yet for the Windsor region, an impact was found. Indeed, interviews with

a Windsor Police Staff Sergeant and the City Clerk of Windsor in April 2000, indicated that in 2000 there were approximately 400 licensed establishments in Windsor and with the Ouellette Street bars open until 2:00 a.m. on weekends, noise complaints and other social problems were occurring.

The limitations of the study are the small number of casualties in the Windsor region. The limited number of alcohol-related casualties and injury collisions, and the rarity of motor vehicle casualties may have made this dataset too insensitive a measure to detect changes for the sub-analyses. For this reason, 7 years of monthly data were used to improve the power of the analyses. However, given the small cell sizes for the disaggregated data, caution must be taken in interpretation. Further research using other measures of alcohol-related problems, such as assaults and impaired driving charges, may provide more sensitive measures of the impact of extended drinking hours.

In summary, the Ontario government’s hope with the extended drinking hour policy change to “reduce the number of patrons who cross the border when Ontario’s bars and restaurants close” may have been realized. The consequence seems to have been increases in total and alcohol-related motor vehicle casualties in the Windsor area and reductions in total and alcohol-related casualties in the Detroit region since the drinking hours were extended in May 1996.

Acknowledgements

This study was funded by the NIAAA. The authors would like to acknowledge the contribution of all collaborators and members of the consensus group to the study, and in the understanding and interpretation of the various datasets. Other members include Dr. Doug Beirness, from the Traffic Injury Research Foundation, Dr. Antoine Haroun, from the Ministry of Transportation of Ontario, Ms. Gina Stoduto, from the Centre for Addiction and Mental Health, and Dr. Peter Lane (deceased), from Albert Einstein Medical Center.

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