Alcohol and Community-based Violence: A Systematic Review

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Abstract

Alcohol is one of the most widely available psychoactive drugs. Both alcohol use and violence share some common physiological, social, and economic variables. While the link between alcohol consumption and violent behaviour has been well established, the mechanisms – social and environmental influences – by which this occurs, are not fully understood. This association highlights the need to gain a better understanding of the contributing factors associated with alcohol-related violence. *Purpose:* To identify the associated effects of alcohol sales on community-based violence as explained in the existing literature. *Methodology*: A systematic review of recent literature published from 1999 to 2009 was completed. The search strategy included only articles published in English, with a specific focus on alcohol sales and community-based violence. Electronic databases, grey literature, reference lists of relevant studies and previously published reviews on similar topics were searched using seventeen keywords representing 'alcohol use' and 'community-based violence'. *Results:* Twenty-eight studies were identified that addressed alcohol outlet density, hours and days of alcohol retail sale, price of alcohol, alcohol sales, characteristics of violent bars, and alcohol-related violent injuries from Emergency Room data. The general finding is that alcohol-related violence is perpetuated by the availability and harmful use of alcohol. *Recommendations and Conclusion:* These research findings provided ample basis for providing direction and recommendations for informing public health policies to reduce alcohol's contribution to community-based violence. Eight strategies and 21 commendations are proposed which follow a coordinated, comprehensive health promotion approach incorporating healthy public policy and community action along with the 'four pillars': prevention, treatment, harm reduction, and enforcement.

1.0 Introduction

Of the many psychoactive substances, alcohol is one of the most recognized, most commonly purchased, and most consumed (World Health Organization, 2004; National Alcohol Strategy Working Group, 2007). According to the 2004 Canadian Addiction Survey, about 80% of Canadians aged 15 years and older report having consumed alcohol at least once in the previous year (Adlaf, Begin, & Sawka, 2005). Alcohol is also the drug most strongly associated with violent behaviour (Room & Rossow, 2001; Murdoch, Pihl, & Ross, 1990).

The link between alcohol intake and violence is well established, negatively impacting the individual who consumes the alcohol as well as those around them. Findings from the 2004 Canadian Addiction Survey indicate that, “Close to a third of the respondents (32.7%) report having been harmed at least once in the past year because of someone else’s drinking” (Adlaf et al., 2005, p. 37). Of these respondents, 10.8% were pushed or shoved, and 3.2% were physically assaulted (Adlaf et al., 2005).

Further studies on violence have repeatedly shown that alcohol consumption precedes violent events (Murdoch et al., 1990; Room & Rossow, 2001; Rossow, Pernanen & Rehm, 2001). “Drunkenness is an important immediate situational factor that can precipitate violence” (Krug, Dahlberg, Mercy, Zwi, & Lozano, 2002, p. 31). In an epidemiological review of 26 studies involving 9,304 violent cases, Murdoch et al. (1990) found that 62% of violent offenders were drinking at the time of their offence.

Although the literature consistently demonstrates that alcohol is associated with violence, the mechanisms – social and environmental influences – by which this occurs are not fully understood. A previous review has also found the relationship between alcohol use and violence to be quite multifaceted and complex:

> *“The link between violence and psychoactive substances involves broad social and economic forces, the settings in which people obtain and consume the substances, and biological processes that underlie all human behaviour. These factors interact in chains of events and may extend back from an intermediate triggering event such as an argument to long-term predisposing processes that begin in childhood.” (Roth, 1994, p. 1)*

From a physiological perspective, alcohol consumption leads to “altered brain receptors and neurotransmitters” which may reduce one’s “fear and anxiety in the social, physical or legal consequences of one’s actions” (Room, Babor, & Rehm, 2005, p. 521). In short, excess alcohol intake impairs judgment, coordination and alters perceptions of risk, all of which may increase one’s chances of engaging in violent incidents (Peterson, Rothfleisch, Zelazo, & Pihl, 1990). Although it is

possible that some combination of these individual physiological effects may enhance or trigger aggressive behaviour and increase the risk of violent incidents, why this results in violence in some individuals and not in others is less clear.

While there has been more recent public and research interest in alcohol-related violence (Klingemann & Gmel, 2001), the mechanisms by which alcohol consumption leads to the escalation of community-based violence particularly in and around bars and retail outlets is not so clear. As alcohol consumption usually takes place in a social setting, separating the two components can be challenging.

1.1 Goals and Objectives

The purpose of this report is to provide a summary of the current research that examines the effects of alcohol consumption on community-based violence. The report's goals are to gain a better understanding on the context-specific contributors to the escalation of alcohol-related violence, to identify the patterns associated with the alcohol-violence link, and to help prevent future alcohol-related violent incidents by informing public health policies. To help achieve these goals this report has the following objectives:

1. To explore patterns in which alcohol use contributes to community-based violence;
2. To identify physical and social factors most vulnerable to the effects of alcohol-related violence; and
3. To provide policy recommendations to address the effects of alcohol on violence at the community level.

1.2 Key Definitions

1.2.1 Alcohol Use

Throughout this paper the terms 'alcohol use', 'alcohol consumption', 'alcohol intake', and 'drinking' are used interchangeably. Unless otherwise noted, 'alcohol use' is defined as the ingestion of alcoholic beverages, including social drinking and the act of consuming liquor.

1.2.2. Alcohol Intoxication

Alcohol intoxication is used synonymously with alcohol impairment and drunkenness. Adapted from Babor et al. (2003), it is defined here as a short-term state of functional impairment in psychological and psychomotor performance induced by the presence of alcohol in the body. In relation to blood alcohol concentration (BAC), a measure of alcohol in the bloodstream of one's body, a person may start to show signs of functional impairment at BAC levels as low as

0.02%[1] (Moskowitz, Burns, Fiorentino, Smiley, & Zador, 2000). However the illegal BAC limits in some countries are set above the 0.05% BAC level (Fell & Voas, 2005). The terms 'binge drinking', 'hazardous drinking', 'harmful drinking', 'alcohol misuse', and 'alcohol abuse' have also been used throughout this report to indicate different forms of alcohol consumption that can lead to acute or chronic alcohol intoxication.

1.2.3 Violence

For the purpose of this report, 'violence' or 'violent behaviour' will be defined as intentional injury – inflicted by deliberate means or through physical force – that results in or has a high likelihood of resulting in injury. For an act to be considered violent, there must not only be harm but also *intent to harm* (Rutherford, Zwi, Grove, & Butchart, 2007). Therefore, aggression and hostility are not classified as "violent", as no actual physical harm has been carried out (e.g., verbal harassment). Of the three types of violence outlined in Figure 1, this report focuses on community-based violence, a type of interpersonal violence that usually occurs between acquaintances or strangers outside of the home (Krug et al., 2002). As such, the terms 'assaults', 'fights', 'brawls' and the like are used interchangeably with 'community-based violence'.

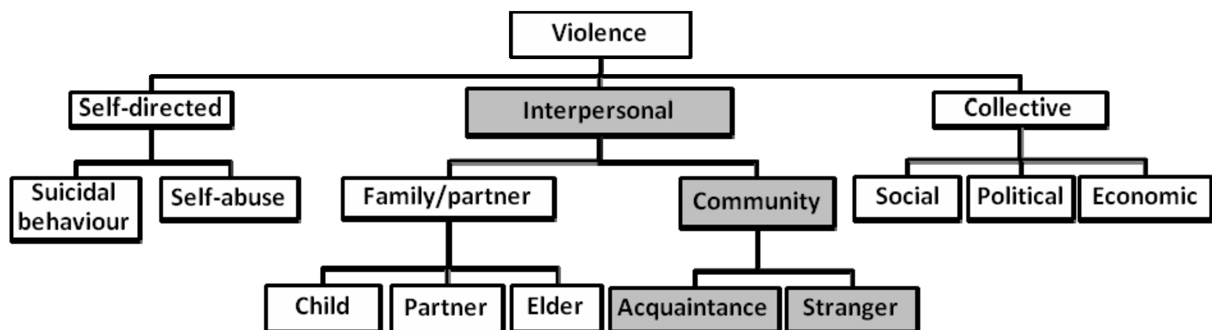


Figure 1: Typology of violence (Krug et al., 2002, p. 14).

[1] The symbol "%" is frequently used to denote g/dl (grams of absolute alcohol per decilitre of whole blood). The "%" symbol is not a true percentage since it represents a measure of weight per volume.

2.0 Methodology

This report outlines the key findings generated from a systematic literature review on the effects of alcohol on violent behaviour at the community level.

2.1 Literature Search Strategy

A review of the literature was performed in June 2009 by one researcher. Inclusion and exclusion criteria were determined by the three authors. The search for relevant literature included print, electronic, published and unpublished materials found by searching library databases, the Internet and reference lists of selected articles.

2.1.1 Electronic Databases

The library search strategy to identify relevant articles used the following electronic databases:

- PubMed;
- Web of Science; and
- Scholars Portal (which included Social Sciences Citation Index, Sociological Abstracts, and Violence and Abuse Abstracts).

These databases were chosen to encompass a wide range of disciplines particular to this topic, including biomedical, social and behavioural sciences. A search of these databases was conducted using the same general search strategy and keywords. The ‘violence’ medical subject heading (MeSH) terms and keywords included the following: violence, etiology; violence, legislation and jurisprudence; violence, prevention and control; violence, trends; assault*; community violence; violent behaviour* and brawl*[2]. These terms were all separated by the ‘OR’ boolean operator. A combination of keywords used to elicit research related to ‘alcohol’ (shown in Exhibit 1) was combined with those related to ‘violence’ with the ‘AND’ boolean operator.

Exhibit 1: Alcohol Keywords
alcohol drinking; alcohol abuse; alcohol consumption; alcohol misuse; alcohol use*; alcohol-related drinking; alcohol-related violence; alcoholic beverages; binge drinking; drunkenness; hazardous drinking; harmful drinking; social drinking.

2.1.2 The Internet

The Internet search included a search for unpublished circulated papers, reports, conference proceedings, and programs from conferences distributed by leading organizations in the field. A list of these Internet sources is available in Appendix A.

[2] The symbol “*” has been used to indicate use of a wildcard function within the terms to find variants of the terms.

2.1.3 Reference Lists

Reference lists of previously published reviews on similar topics were screened for relevant articles. Reference lists of included studies resulting from the library search strategy were also screened in the same manner.

2.2 Library Search Strategy and Study Selection

For the purpose of this review, studies were not limited to specific outcome measures. The search strategy included only articles published in English, from January 1999 to June 2009. Only primary research articles were included in this report. Studies meeting these parameters were retrieved and reviewed by one researcher including those studies that met the following necessary criteria:

1. The study assessed alcohol intake and/or availability.
2. The study assessed community-based violence documented through measured cases of injury, assault, violent crime and the like.

Studies which met at least one of the following exclusion criteria were not considered eligible and were omitted from the next level of screening:

- Studies that focused on victims of alcohol-related violence or the views of the abused;
- Studies whose measure of violence was in the form of war, terrorism, or violent political conflict;
- Studies on the treatment of alcoholism;
- Studies that described the effects of alcoholism or alcohol-induced disorders;
- Studies whose focus was on a specific type of injury such as human bite injury, head trauma, traumatic brain injury; and
- Studies that only focused on a specific population such as young adults or Aboriginals.

The initial library search of electronic databases identified 1,026 titles. After an initial screening by one researcher, only 225 titles were determined eligible for further review. From these, relevant abstracts were located, retrieved, and screened against inclusion and exclusion criteria in the same manner as titles. This screening method resulted in 75 relevant abstracts. From these, full text articles were obtained for independent review of eligibility.

2.3 Results of the Literature Review

In total, 28 studies met the above inclusion and exclusion criteria. These studies were then assessed in full, with relevant information abstracted by one researcher, using standardized data extraction forms (Appendix B). These studies were then reviewed for validity and applicability by a second researcher. A summary of the library search results and a flow chart of included studies are shown in Appendix C and D.

Included studies used a variety of study designs, including cross-sectional, retrospective, case-crossover, longitudinal, general population survey, case-control, and time-series analysis.

2.3.1 Measure of Alcohol Intake

Indirect measures of alcohol consumption were made through alcohol sales (collected from receipts of wholesales dealers of alcohol products and volume of alcohol sold at outlet stores) and price (average beer price per pint), liquor licensing records (which varied depending on the location of the study, including general, on-premise, off-premise, packaged, on-sales, and off-sales), and clinical observation of intoxication judged by the Emergency Department's staff member at first contact with the patient.

Direct measures of alcohol use were obtained from participant self-reports of alcohol consumption (often by asking respondents whether they had consumed alcohol in the six hours prior to the incident), and blood alcohol concentration, including breath samples.

2.3.2 Measure of Violence

Violence was measured using assault and crime data from police records and court convicted assault cases. On top of self-reported experiences with violence, other measures of violence included hospital discharge data of recorded assault patients, and injury data from Emergency Departments. Injuries were also captured by the Canadian Institute of Health Information Discharge Abstract Database, using International Classification of Disease – 10th revisions (ICD-10) codes.

2.4 Limitations of Methodology

2.4.1 Police Records

Official police reports of assaults (Nielsen & Martinez, 2003) are a useful indicator of violence, but they too can be problematic. First, it is likely that a reported assault reflects only a small proportion of all violent incidents within a community (Verrill & Sheron, 2005). According to Shepherd (2007), the 2000 British Crime Survey data showed that 75% of 'moderately serious' violent offences do not appear in police records. It is unlikely that perpetrators of violent acts report their behaviour to police, for example. Second, assault charges may not be a true account of assault offenses (Vingilis et al., 2008). The number of assault charges depends not only on police availability and recording protocols: for example, intoxication from alcohol could minimize or delay police reporting. Furthermore, there is no real measure of whether assault offense data is related to alcohol consumption, or whether they relate to particular licensing establishments and a higher police presence.

2.4.2 Emergency Department Data

Emergency Department data only capture alcohol-related violence that requires medical attention. Many victims may also seek treatment from other sources.

Some injuries related to violence in the Emergency Department sample may also have gone unrecognized, possibly because of a failure to report the cause of injury. In many instances, Emergency Department data pertain only to the victim, leaving out details of the state of the perpetrator.

2.4.3 Overall Limitations of the Review Methodology

On top of the limitations described for each type of study, the review methodology itself has some weaknesses. First, included studies were abstracted by one researcher. Even though the abstraction forms (Appendix B) were reviewed by a second researcher, initial selection bias may exist during the screening process. Furthermore, the scope of the search terms could have included 'intentional injuries', which was not the case for this report. Limitations on time and resources have also limited the scope of included studies. As the literature scan was completed in June 2009, studies published afterwards have not been included in the results of this report.

3.0 Results

This review summarizes the research evidence linking alcohol sales and community-based violence. Six major categories of alcohol-related violence studies were identified:

1. Those that calculated alcohol outlet density;
2. Those that estimated changes in alcohol pricing;
3. Those that monitored alcohol sales;
4. Those that assessed the restriction or extension of the hours in which retail alcohol sales are permitted;
5. Those that analyzed the characteristics of on-premise establishments; and
6. Those that used Emergency Department data.

3.1 The Link between Alcohol Outlet Density and Violence

The relation between violence and alcohol outlets has been documented in a number of recent ecological studies (Gorman, Speer, Gruenewald, & Labouvie, 2001; Gruenewald, Freisthler, Remer, Lascala & Treno, 2006; Gruenewald & Remer, 2006; Lipton & Gruenewald, 2002; Livingston, 2008a; Livingston, 2008b; Norstrom, 2000). While many of these studies emphasized the importance of the socio-demographic composition of neighbourhoods – population density, residential instability and socially disadvantaged populations – alcohol outlet density (the number of alcohol retail outlets per unit of population) was positively associated with levels of violence.

3.1.1 Why Alcohol Outlet Density and Violence are Linked

There are two dominant theories about why alcohol outlet density and violence appear to be linked. One is the ‘selection effect theory’ and the other is the ‘social disorganization theory’.

The ‘selection effect theory’ suggests that outlets, on their own, create violence (Nielsen & Martinez, 2003). This perspective emphasizes the ways in which alcohol outlets are used by potentially violent drinkers. For instance, the influences that greater access to alcohol has on the selection of drinking places and the mixing of populations within these places are factors that create violence (Gruenewald et al., 2006). This theory suggests that drinkers move routinely about their environments and select places to drink based upon characteristics of different outlets and other drinkers.

The ‘social disorganization theory’ presents a view that outlets provide a context for violence (Lipton & Gruenewald, 2002). From this perspective, emphasis is placed on the effects of alcohol outlets and the behaviours of drinkers at those outlets on social norms that constrain or enable violence (Nielsen & Martinez, 2003). Alcohol outlets may represent a negative influence that promotes and encourages violence (Peterson, Krivo, & Harris, 2000); it is debated whether the number of bars is an additional, exogenous factor that affects the rate of violence (Norstrom, 2000). It is also possible that neighbourhoods with high alcohol outlet

density can have both high levels of violence as well as a greater acceptance of alcohol-related violence. This suggests that outlet density and greater acceptability of alcohol-related violence may coexist.

Gorman et al. (2001) illustrated these exogenous factors as follows: “broken bottles and bars send essentially the same message as do broken windows, which is that mechanisms of informal social control have ceased to function” (p. 628). In this sense, the presence of high alcohol outlet density may represent a form of neighbourhood disorder, whereby organized communities exercise political power and legal options to keep out alcohol outlets, while disorganized communities cannot (Peterson et al., 2000). Therefore, the presence of high alcohol outlet densities may reduce social prohibitions against violence, and subsequently, enable violence in community areas.

The effects of alcohol availability and alcohol outlet density are consistent with both the selection effects and the social disorganization theory. It may be that individuals select outlets that have a higher likelihood of violence or that outlets themselves represent a type of institution in neighbourhoods that undermine the ability to exert social control. These two theories are not mutually exclusive and, as such, it is possible that the alcohol-violence link is an inter-play of both.

3.1.2 Findings from Geospatial Studies

Geospatial studies linking alcohol outlet density and rates of violence have uniformly illustrated a positive relation between outlet density and rates of violence (Lipton & Gruenewald, 2002; Livingston, 2008b; Nielsen & Martinez, 2003; Reid, Hughey & Peterson, 2003). In fact, Livingston’s (2008a) spatial analysis of outlet density and violence indicates that “while the overall relationship is positive, with alcohol-related assaults increasing with the number of outlets, there may be a [crucial threshold] point after which each additional outlet contributes increasing numbers of additional assaults” (p. 625).

Livingston (2008a) examined the spatial relationship between density of three types of outlet licenses (general, on-premise, and packaged) and alcohol-related assault rates in Melbourne, Australia. General and on-premise licensing densities were more strongly associated with the alcohol-related assault rate than was packaging licensing density (those that allow alcohol to be sold for off-premise consumption only). The results of this study provide further evidence of a cross-sectional link between alcohol outlet densities and violence and suggest that the effect of outlet density on violence differs with each type of outlet.

3.1.3 Evidence from Small City-Centre Studies

Violence is typically concentrated in “relatively small city-centre entertainment areas, occurring most frequently in and around pubs and clubs on weekend nights” (Warburton & Shepherd, 2006, p. 12). One European city-centre study found a positive relation between small area licensed premises capacity – a proxy measure for crowding – and violence (Warburton & Shepherd, 2006).

Although street assault correlated significantly with numbers and capacity of premises, the major predictor of violent incidents is “the concentration of these premises in close proximity to each other and the presence of high-risk premises that leads to problems” (Warburton & Shepherd, 2006, p. 15). The findings from these two small city-centre studies highlight the potential importance to urban planning and public health in considering “the mix of institutions in urban areas” (Reid et al., 2003, p. 1978).

3.1.4 Evidence from Longitudinal Studies

A small number of studies have provided further evidence to demonstrate that changes in outlet density over time are related to changes in rates of violence (Gruenewald et al., 2006; Livingston, 2008b). Among the few methodologically rigorous longitudinal studies employing traditional time-series analysis, Norstrom (2000) assessed the relation between criminal violence, which included convictions (court data of persons convicted of violent offenses), and investigations (police statistics of offenses being investigated), and alcohol outlet density in Norway from 1960 to 1995. The authors found a positive and statistically significant relationship between outlet density and crimes of violence investigated by the police and suggested that, on average, an increase of one outlet corresponded to an increase in approximately 0.9 investigated assaults per year (Norstrom, 2000).

3.1.5 Impact of Neighbourhood

Several cross-sectional studies have presented findings on how alcohol outlets relate differently to violence according to neighbourhood characteristics (Gruenewald et al., 2006; Gruenewald & Remer, 2006; Nielsen & Martinez, 2003). In particular, these studies have investigated potential confounders of the outlets-violence connection.

For instance, Lipton and Gruenewald (2002), and Gorman et al. (2001) focused on population characteristics of surrounding alcohol outlet areas and found powerful effects for population density and structural variables associated with adjacent neighbourhoods. In particular, they found that greater population densities in surrounding areas and greater levels of impoverishment among these populations were related to increased violent crime rates in neighbourhoods where bars are located (Gorman et al., 2001; Gruenewald et al., 2006; Nielsen & Martinez, 2003). In particular, Gruenewald et al. (2006) found that bars had a marked positive effect on violence in poor, unstable areas (violence rates increased with increased alcohol outlets), but were actually protective in stable, wealthy ones (violence rates decreased with increased alcohol outlets). In addition, other place characteristics, such as vacant or deteriorating housing, retail activities and illegal drug markets, seemed to be related to lower levels of police enforcement, which would permit higher rates of violence.

There is evidence from several countries that drinking patterns – in terms of total alcohol sales, and outlet and beverage preferences – are related to age, gender, culture, income, and education level. For instance, young males tend to drink beer, and prefer nightclubs and hotels to other venues (Stevenson, Lind & Weatherburn, 1999). Higher income and education level tend to be associated with greater alcohol consumption in restaurants, while lower income levels are associated with greater alcohol consumption in bars (Stevenson et al., 1999). These population and place characteristics suggest that the impacts of alcohol outlet densities on violence may be context specific and support the view that "some sort of spatial interaction between population and places with more alcohol outlets are associated with rates of violence" (Gruenewald & Remer, 2006, p. 1191).

3.2 Alcohol Price and Rates of Violence

Wagenaar, Salois, & Komro's (2009) meta-analysis of 112 studies found that higher alcoholic beverage taxes and prices reduce alcohol use. Wagenaar and his colleagues found that this relationship applies to all alcohol beverages, and not only to overall consumption, but also to heavy drinking (Wagenaar et al., 2009). Sivarajasingam, Matthews & Shepherd (2006) investigated the relationship between violence-related injury and price of alcohol in England and Wales from 1995 to 2000. In total, 353,433 alcohol-related violence Emergency Department cases were analyzed along with the regional price of alcohol. The authors found that "high regional violence-related injury rates correlated with low real price of alcohol as measured by price of beer" and estimated that a "one-percent sustained increase in the price of alcohol above inflation will decrease violent injuries by nearly 2,200 a month in England and Wales" (p. 392). Furthermore, in a survey study conducted in New York, Quigley, Leonard, & Collins (2003) found that "the cost of drinks was reported to be lower in violent bars than in nonviolent bars" (p. 768). These findings suggest that increases in the price of alcoholic beverages may be an effective means of reducing violent injuries.

3.3 Alcohol Sales and Rates of Violence

Several studies (from the United Kingdom, Australia, and Canada) have demonstrated that increased sales through alcohol outlets have been correlated with higher rates of violence (Ray et al., 2008; Sivarajasingam et al., 2006; Stevenson et al., 1999). Factors shown to be important in this link include the volume of alcohol consumed and its pattern of consumption, cultural characteristics, social context, and income inequality. Differences in drinking culture are especially important, since greater acceptance of alcohol misuse is likely to spur alcohol sales and levels of violence (Rossow, 2001).

With the sale of alcohol through on-premise licensing establishments, drinkers are already in a public place, surrounded by others, presenting opportunities for interpersonal violence. It may be that "higher per capita alcohol sales merely reflect greater social contact, thus expressing nothing more than the degree of

opportunity to offend or be a victim of crime" (Stevenson et al., 1999, p. 408). If that is the case, a stronger relationship should be found between alcohol sales and violence from hotels and clubs, than for any of the other types of outlets (Stevenson et al., 1999). For the sale of alcohol on off-premise licensed establishments such as Liquor Control Board of Ontario (LCBO) outlet stores studied in Ray et al. (2008), the course of events is less obvious.

Ray et al. (2008) assessed the association between retail alcohol sales across Ontario, Canada, and risk of hospitalization for intentional injury. Ray and his colleagues found that the risk of being hospitalized because of a violent assault was higher among those who live in the immediate vicinity of alcohol outlets with rising sales, measured through total volume of alcohol sold at each outlet. The authors used a rare case-crossover design to establish the relative risk of assault per volume of alcohol sales from government-run liquor stores. The volume of alcohol sold at the store in closest proximity to an assault victim's home on the day before the assault, was compared to the volume of alcohol sold at the same store seven days earlier. Ray and his colleagues (2008) found "a 13% higher risk of being hospitalized for assault with each additional 1,000 [litres] of alcohol sold per day, equivalent to about a doubling of the usual daily sales" (p. 728). The risk of being violently assaulted was 41% higher during periods of peak alcohol sales than when sales were at their lowest (Ray et al., 2008). Young men, aged 13 to 20, who lived in urban areas were at the highest risk for assault. This study illustrates how alcohol sales may be linked to individual risk for assault.

Consistent with previous research, Bye (2007) found that assault rates tend to change with changes in alcohol consumption at the population level. Bye studied trends in violence rates and alcohol sales in Norway from the period 1880 to 2003 and 1911 to 2003, and found that a one litre per-year per-capita increase in alcohol consumption will, on average, increase the rate of criminal violence by approximately 8%. This finding also supports the view that alcohol consumption has an independent effect on the incidence of violence.

3.4 Hours of Alcohol Sales

The relation between extended retail sale hours, individual levels of intoxication, and alcohol-related violence are not so clear. 'Availability theory' asserts that alcohol availability influences the levels of alcohol consumption, which in turn influences the levels of alcohol-related violence (Mann, 2005; Ragnarsdottir, Kjartansdottir & Daviosdottir, 2002). Based on this theory, one may hypothesize that extending drinking hours increases general population-based alcohol consumption, which then increases rates of alcohol-related violence. A large number of studies have also supported this view, and have suggested that increases in temporal access to alcohol, through extended drinking hours, would lead to increasing rates of violence (Chikritzhs & Stockwell, 2002; Room et al., 2005).

3.4.1 Extending Hours and Days of Alcohol Sales

One study examined this relationship by assessing the impact of extended drinking hours on levels of violent assaults on or near licensed establishments in Australia. The authors found that increases in temporal access to alcohol led to increases in violence (Chikritzhs & Stockwell, 2002). While Chikritzhs and Stockwell have for the most part only investigated modest changes in alcohol sales hours, they found significant increases in the level of violent assaults, which was mostly explained by increased volumes of alcohol purchased following extension of licensed drinking hours. As such, the authors suggest that the greater number of patrons and increased levels of intoxication probably accounted for the observed increase in violence.

The above finding is an interesting contrast to what proponents of increased alcohol hours have claimed. One such claim is that increased drinking time allows drinkers to "pace themselves" rather than engage in binge drinking. For adults, binge drinking is the consumption of more than five or more standard alcoholic drinks in one sitting or event (Adlaf et al., 2005). There have also been claims that extended drinking hours prevents the mass exiting of patrons at a single closing time, enabling police to better control and patrol high-risk areas at high-risk times. While this seems plausible, it is backed up by little formal research. Even so, one cannot disregard the observation that increasing alcohol availability is not consistently associated with higher rates of violence (Norstrom & Skog, 2005). Two studies presented below provide further evidence to this effect.

Recent policy changes in Sweden of extending days of alcohol retail sales enabled Norstrom and Skog (2005) to evaluate changes in assault levels. In 2000, a trial period took place in which monopoly shops were kept open on Saturdays in certain parts of the country. Seventeen months later, Saturday opening was extended to the rest of Sweden. The authors, who were commissioned to perform the evaluation post-policy change, found that the extension in retail sales to the whole of Sweden was followed by a slight increase in total alcohol sales of about 4%. However, no significant change was found in the indicators of alcohol-related assaults.

The only Ontario-based evaluation on hours of alcohol retail sales was conducted by Vingilis, Mcleod, Mann & Seeley (2008). They examined the impact of extended drinking hours in two cities in southwestern Ontario. On May 1, 1996, the Ontario provincial government amended the Liquor License Act to extend hours of alcohol sales and service in licensed establishments from 1:00 a.m. to 2:00 a.m. This amendment was made so that hours of alcohol sales in Ontario would be consistent with the cross-border jurisdictions in U.S. states and Canadian provinces. Vingilis et al. (2008) investigated how this new policy affected assault rates in London, Ontario (which was affected by the extended drinking hours only) and Windsor, Ontario (which was affected by extended drinking hours and cross-border drinking). No overall increase in assaults was

observed in either locale. This finding reinforces the idea that extending drinking hours may not always lead to increased rates of violence.

3.4.2 Restricting Alcohol Sale Hours

Restricting hours of alcohol sales is another potential method of limiting alcohol availability and related violence. A policy to restrict alcohol sales was introduced in July 2002, prohibiting on-premise alcohol sales after 11:00 p.m. in Diadema, a predominantly low socio-economic status city in Brazil. Before the law, most bars remained open 24 hours. The authors analyzed assault data from 2000 to 2005 and found that “the average monthly [number of] assaults fell from 48 during the 2 years before the new law to 25 assaults in the 3 years after it” (Duailibi et al., 2007). However, underlying trends were not accounted for in their analysis, and it is unclear if these effects were the result of the new law or another underlying factor.

3.5 Characteristics of Violent Bars

Although violence may occur in a number of settings, alcohol-related violence is largely embedded in two common social settings: the home and the bar (Humphrey, Casswell & Han, 2003). The drinking setting can exert a considerable influence on behaviour through expectations, physical and social characteristics of that environment, levels of intoxication permitted therein, and the characteristics of other persons within the setting (Graham & West, 2001). In a general population survey of adults aged 18-60 in the province of Ontario, Canada, respondents were asked whether they had been personally involved in an incident of physical aggression in the past 12 months and, if so, where the most recent incident occurred (Graham, Wells & Jelley, 2002). The most frequent location for aggression was in or near licensed premises such as a bar or nightclub (30% of all incidents), and the proportion occurring in or near licensed premises was even higher for young adults, especially young males (Graham et al., 2002). These figures suggest the commonality of bar violence.

3.5.1 Bar Violence Defined

Across studies, bar violence usually refers to physical assaults that occur within commercial establishments that serve alcohol. There are a variety of terms that have been used to describe these locations, including bar, tavern, hotel, club, and nightclub. Restaurants are also included in some investigations as a drinking establishment. The prevalence of bar violence has been addressed in only a few studies. Macdonald, Wells, Giesbrecht, and Cherpitel (1999) examined admissions to Emergency Rooms and found that 37% of violent injuries had occurred in a bar.

3.5.2 Physical and Social Characteristics of Violent Bars

Whether or not alcohol outlets become hot spots for violence depends on such features as location, clientele, and the conditions that prevail therein, such as crowding. “Not everyone who attends bars experiences violence, and not all bars are places in which violence frequently occurs” (Quigley et al., 2003, p. 765).

Certain bars tend to attract hostile, under-socialized and/or risk-taking individuals. Briscoe and Donnelly (2003) examined the distribution of violent crime across licensed premises in three inner-urban areas of New South Wales and found that a large proportion of violent incidents occurred within a small proportion of licensed premises. These premises were more likely to be hotels or nightclubs and were more likely to have extended hours of alcohol sales.

"Characteristics of the bar that may promote violence can be categorized as either physical or social in nature," (p. 765) explains Quigley et al. (2003). The physical and social characteristics within a bar that are associated with violence are summarized in Table 1. In particular, high crowd density and the capacity of venue are both important factors which may increase the chances of an individual invading another's personal space, and may also provide greater opportunity for potential offenders to come into contact with potential victims (Quigley et al., 2003). Certain activities, like pool tables, dancing and the use of illegal drugs have been found to be more frequent in violent bars than in nonviolent bars (Quigley et al., 2003).

The environment can also provide expectations about how to behave when drinking. Patron behaviour and management practices are a good indication of the overall 'permissiveness' of an establishment. For instance, "A clean well-kept bar with a helpful and friendly staff is less likely to suggest to drinkers that antinormative behaviour is acceptable [or tolerated] than is a dirty and poorly maintained bar with an unfriendly bar staff" (Quigley et al., 2003, p. 765). Similarly, high levels of swearing and overt expressions of sexual activity are also reflective of an overly permissive environment. Quigley et al. found that staff gender breakdown also had a relation with bar violence, since "violent bars were more likely to employ bouncers and to be staffed by more men than women" (p. 768).

Table 1: Summary of physical and social characteristics associated with violent bars.

Physical Characteristics	Social Characteristics
Overall comfort	**Certain behaviours**
High temperature	Rowdiness
High levels of noise and music	Overt expressions of sexual activity
Poor lighting	High levels of swearing
Poor ventilation	Sexual or general competition
Smoke-filled air	Heavy drinking or intoxication
Dirtiness	Underage drinking
Uncomfortable seating	Illegal drug use
	Dancing
Crowd characteristics	**Bar location**
Crowd density	Proximity to other bars
Capacity of venue	Neighbourhood area where bar is located (residential district versus entertainment district)
Ethnic mix of patrons	
Others	**Management practices**
Presence of pool tables or billiards	Staff gender and attitude
Availability of public transport	Permissiveness of environment
Discounted drinks	Maintenance of bar environment
Employed bouncers	Serving to intoxication

(Briscoe & Donnelly, 2003; Graham & West, 2001; Graham, Osgood, Wells & Stockwell, 2006; Graham et al., 2002; Homel, Carvolth, Hauritz, McIlwain & Teague, 2004; Quigley et al., 2003)

3.5.3 Levels of Intoxication

Studies on barroom violence have found that the frequency of violent incidents increases with the level of intoxicated patrons (Chikritzhs & Stockwell, 2002). Graham et al. (2006) analyzed incidents of aggression (including violence) recorded by trained observers who attended large-capacity bars and clubs in Toronto, Canada. Not only was there a positive association between level of intoxication and severity of violent incidents but intoxication was also found to be a major determinant of the frequency and severity of alcohol-related violence (Graham et al., 2006). Furthermore, not only is the absolute level of intoxication a predictor of violence, but the level of intoxication relative to others was also a moderating factor in the relation between intoxication and violence (Graham et al., 2006). These results suggest that greater attention needs to be paid to group dynamics, and they highlight the need for preventive efforts focusing on both identifying bars that typically have more intoxicated patrons, and reducing the general intoxication levels of patrons (Graham et al., 2006; Homel et al., 2004).

Efforts targeted towards reducing levels of patron intoxication have been successful. Homel et al. (2004) showed that reducing levels of intoxication of bar

patrons at nightclubs in city-centre entertainment areas in Australia reduced violence. His observational study found that while control of drinking was a necessary measure to reduce violence, it was not sufficient. Key environmental variables most closely associated with declining violence rates were identified: improved comfort, availability of public transport, less overt sexual activity, and fewer highly drunk men (Homel et al., 2004). Availability of public transport is an interesting predictor, since it is unrelated to bar permissiveness and management style. Homel et al. (2004) suggested that since most violent incidents occur on the streets and in taxi lines involving patrons trying to find a way home in the early hours of the morning, then it is not surprising that the availability of public transport was identified as a key predictor of lower violence rates. These findings highlight the potential for violence-prone bars to modify their drinking environment in order to curtail potential violence within their establishment.

3.5.4 Characteristics of Violent Patrons

Characteristics of bars are not always the culprit of alcohol-related violence. Sometimes it is the characteristics of the patrons of a bar that increase the likelihood of violence therein. In light of this, Quigley et al. (2003) proposed, "in most instances, violent and heavy-drinking people are attracted to bars with physical and social conditions that promote aggressive behaviour" (p. 770). The demographic characteristics of those involved in barroom violence are consistent across the literature and predominantly include men (because they are generally are more aggressive than women) and young individuals (because they are more likely to experience and perpetuate violence) (Graham et al., 2002; Quigley et al., 2003). According to the Canadian Addiction Survey, high-risk drinkers are predominantly males and those under the age of 25 (Adlaf et al., 2005).

"Violence may be a problem at certain bars, in part, because these bars are places that bring young men together" (Quigley et al., 2003, p. 766). In Borges et al. (2008), of all violence-related injuries in which alcohol consumption was recorded, 80% were male, and 67% were under 30 years of age. Furthermore, in Pachuca, Mexico, "patients with violence-related injuries were more likely to be male, younger, to have lower school attainment, and come from blue-collar occupation," (Borges, Cherpitel, Medina-Mora & Mondragon, 2004, p. 918). These demographic characteristics are consistent with those found as indicators of alcohol and violence related injuries from Emergency Room data in Canada (Macdonald et al., 2005; Macdonald et al., 2006).

In Canada, other indicators of alcohol-related violence in the bar setting include educational attainment, income level, and marital status (Macdonald et al., 2005). Although there is considerable evidence linking personality to alcohol use, the evidence linking personality to bar violence is less direct. It is clear, however, that constructs such as hostility and impulsivity are associated with both alcohol use and violent behaviour.

3.5.5 Interaction between Violent Bars and Violent Patrons

Explaining why violence occurs at certain bars requires an examination of the whole environment of a licensed venue, including the characteristics of the bar, the personalities and mix of its patrons, and how the two interact. “On the one hand, individual characteristics may lead one to prefer a specific kind of bar. Heavier drinkers with high levels of anger may choose bars with characteristics that foster or enable illegal or disinhibited behaviour. On the other hand, the individual’s characteristics may help to shape the characteristics of the bar” (Quigley et al., 2003, p. 770). In other words, some bar characteristics may result from, rather than cause, violence. Quigley et al. illustrated this phenomenon with respect to how the presence of male bouncers is a distinguishing characteristic of violent bars. For instance, in some cases, male bouncers may have been hired as a response to violence, while in others, the presence of male bouncers may have stimulated aggressive behaviour by offended patrons.

Quigley et al. investigated whether bar violence is a function of both the clientele and the physical and social characteristics of the bar itself. Their analysis found individual differences in age, anger, and alcohol use that distinguished individuals who frequent violent bars from those who do not. In particular, those who frequent violent bars were more likely to be younger, to be more impulsive, have alcohol dependence problems (ADS) and express anger more openly (Quigley et al., 2003). This anecdotal evidence suggests that certain bars “attract” a certain clientele.

3.6 Alcohol and Violence-related Injuries from Emergency Room Data

Violence is among the top causes of alcohol-related injuries presenting to the Emergency Department (Macdonald et al., 2006). In several studies across Latin America (Borges et al., 2008) and New Zealand (Humphrey et al., 2003), 35-50% of all patients with a violence-related injury had recently consumed alcohol. This finding substantiates a common view in Emergency Departments that alcohol consumption is a major problem among their patients.

In two Canadian studies, Macdonald et al. (2005) and Macdonald et al. (2006) merged Emergency Room data from as many as 16 countries to investigate alcohol impairment (based on BAC) for different types, causes, and contexts of injury. Macdonald et al. (2006) found that patients with alcohol impairment were significantly more likely to be involved in violence than any other causes (such as vehicle crashes, falling, poisoning, or burns). In other words, alcohol-related violence accounted for more injuries, in absolute terms, than any other cause. In particular, approximately 22% of those with violent injuries were intoxicated, as opposed to 8% of those involved in motor vehicle crashes. In addition, there is evidence that the risk and severity of a violence-related injury increases sharply with increasing amounts of alcohol consumed (Borges et al., 2008; Humphrey et al., 2003; Macdonald et al., 2006).

Other Emergency Department studies have found a significant association between alcohol consumption and violent injury. Macdonald et al. (2005) found that “a positive blood alcohol content (BAC) and a BAC of 80 mg% were significantly related to violence” (p.111). A significant association was also found between a BAC level over 80 mg% and the number of body regions injured (Macdonald et al., 2006). These results point to a causal role of alcohol in injuries related to violence, and suggest that the relation between alcohol consumption prior to the time of the injury/violence is stronger than the relation between general alcohol consumption patterns (or dependence) and violence (Macdonald et al., 2005; Rehm et al., 2003).

Borges et al. (2004) found that heavy alcohol use, consumption of several drinks, alcohol dependence, using alcohol six hours prior to injury, and increased frequency of drunkenness were all associated with an elevated risk of violence-related injury. Those consuming alcohol six hours prior to injury had the strongest association with violent injury (Borges et al., 2004): “Those consuming alcohol within 6 h prior, compared to those not drinking during this time, were found to be 34 times more likely to have a violence-related injury among all cases [of Emergency Room attendees] and controls, and 23 times more likely to have a violence-related injury among drinkers” (p. 922). These results suggest that the acute intoxicant and transient effects of alcohol, rather than the long-term consequences associated with its use, are precipitants of intentional injury.

In terms of type of injury, Macdonald et al. (2006) found that the highest percentage were head injuries and concussions. Such injuries were significantly more likely to occur at a bar or restaurant, and least likely to occur at school or in the workplace (Macdonald et al., 2005; Macdonald et al., 2006). Consistent with previous findings, this is likely due to the location in which alcohol is consumed. “Most patrons drink at bars and alcohol is available at most restaurants” (Macdonald et al., 2006, p. 1110). Therefore, contextual factors play a very important role in the location of alcohol consumption as well as on injuries resulting from alcohol-related violence.

The outcomes explored from Emergency Department data illustrate a growing consensus that alcohol plays an important role in violence and use of emergency services.

3.7 Psychoactive Substances and Alcohol

A considerable amount of research has argued that alcohol use and violence share common risk factors. This paper recognizes that alcohol’s effect on violence seldom exists on its own, but is often associated with other co-factors. Although the present review has already identified a number of co-factors, there are some predominant psychoactive substances that have been correlated with the use of alcohol. Some of these substances include illicit drugs, marijuana, stimulants, and tobacco. One theory argues that the increased use of cigarettes and alcohol among younger adolescents leads to greater use of marijuana,

which, in turn, leads to subsequent use of other drugs (e.g., cocaine, heroin, hallucinogens). Detractors of this theory claim that the use of these substances is a symptom of a larger set of destructive behaviours that includes violence (Merrill, Kleber, Shwartz, Liu & Lewis, 1999). Perhaps aside from these substances, the most important factor is the local characteristics of illegal drug markets, whose distribution is often closely tied with violence (Gruenewald et al., 2006).

Although not the major focus of this review, both alcohol and cocaine use appear to play a significant role in violent behaviour (Macdonald, Erickson, Wells, Hathaway & Pakula, 2008). Illicit drugs and alcohol are often used in combination. Illicit drugs are more commonly used in men aged 20 to 40 years and are strongly associated with violence-related injuries (Vitale & van de Mheen, 2006). Early-age of onset of alcohol and marijuana use has also been associated with an increased likelihood of engaging in violence-related behaviours (Reid, Garcia-Reid, Klein & McDougall, 2008). Additionally, the concurrent use of alcohol and cigarettes in adolescents has also been associated with violence (Orlando, Tucker, Ellickson & Klein, 2005). Screening for alcohol, drug, and tobacco use among teens in urban Emergency Departments may identify those at risk of future injury (Walton et al., 2006).

4.0 Summary of Findings

The key findings from published international research on alcohol consumption, and the many direct and indirect ways it contributes to community-based violence, are presented below. In general, alcohol and community-based violence can be addressed by controlling the availability of and harmful use of alcohol.

- *Alcohol outlet density* is positively associated with rates of violence (Lipton & Gruenewald, 2002; Livingston, 2008b; Nielsen & Martinez, 2003; Reid, Hughey & Peterson, 2003); that is, they tend to increase together. However the level of association is dependent on the type of outlet –with pubs and clubs increasing the strength of the association– and the kind of neighbourhood outlets are located in (Gruenewald et al., 2006; Warburton & Shepherd, 2006).
- High *alcohol price* reduces alcohol consumption while low alcohol price is correlated with high regional violence-related injury (Wagenaar et al., 2009).
- *Alcohol sales*, which can be used as a proxy measure for alcohol consumption, have been positively associated with incidence of violence. Increased sales through alcohol outlets have been correlated with higher rates of violence (Ray et al., 2008; Sivarajasingam et al., 2006; Stevenson et al., 1999).
- Risk of hospitalization due to violent assault is 13% higher with each doubling of usual daily *alcohol sales* of the closest LCBO outlet (Ray et al., 2008).
- Extending *alcohol sale hours* does not always increase the level of violence, however, when it does, it is usually because of increased levels of intoxication from higher volume of alcohol consumed and because of crowding (Chikritzhs & Stockwell, 2002).
- Research on *characteristics of violent patrons* found that the frequency of violence incidences increases with the level of intoxicated patrons (Chikritzhs & Stockwell, 2002).
- Research on *bar violence* consistently shows the peak time for violent offending is weekend nights and the peak location is in and around pubs and clubs (Warburton & Shepherd, 2006). Furthermore, both physical and social factors are associated with violence in high-risk pubs (see Table 1, p. 19).
- *Emergency Department* studies found that alcohol-related violence accounted for more injuries than any other causes (e.g., vehicle crashes, falls, poisoning, or burns). Of those with violent injuries, 22% were intoxicated, as opposed to 8% of those involved in motor vehicle crashes (Macdonald et al., 2006).

5.0 Recommendations

While there are methodological limitations to the studies reviewed in this report, the overall strength of the evidence provides enough basis to assert that excess alcohol consumption contributes to community-based violence.

The results from this research report emphasize the increasing need for a public health policy to address alcohol-related harm, as it relates to violence. Many incidents of violence can be prevented by reducing population alcohol consumption, particularly in areas of high alcohol outlet concentration such as bars. While regulations such as a minimum drinking age and a maximum BAC level for drivers currently exist in Ontario, even these policies are not easily enforceable. Alcohol is readily available, and there is a high density of retail alcohol sales outlets across the province, especially in downtown urban areas.

The following eight strategies and 21 recommendations are a culmination of data extracted from the literature review, along with the expertise of staff at Ontario Public Health Association's (OPHA) Alcohol Policy Network. These are primarily intended for use by the 36 public health units in Ontario, but others may find the evidence-based recommendations useful and relevant. These recommendations are consistent with, and supportive of, those found in the proposed National Alcohol Strategy led by the National Alcohol Strategy Working Group (2007), the Ontario Public Health Standards (Ontario Ministry of Health and Long-Term Care, 2008) that guide Ontario's public health units, the World Health Organization's (2009) briefing on violence prevention, as well as the work of Babor et al. (2003), Mosher & Jernigan (2001), and others.

Strategy 1: Regulating Alcohol Availability

A number of restrictive policies designed to limit the availability of alcohol have been introduced over the years (see Appendix E) in the hope of decreasing both population consumption of alcohol and the incidence of alcohol-related problems. Public Health groups can work with relevant stakeholders and government departments to effect such policy change. Recommendations, therefore, include:

1.1 Limit outlet density - limiting the number of alcohol outlets in a given area may reduce the number of violent incidents. Also, the probability of violence is likely to decrease by limiting the venue capacity of alcohol outlets in high density areas.

1.2 Limit the opening of new outlets – this strategy is especially important in areas that already have a high density of alcohol outlets. In addition, the slowing or cessation of issuing liquor licenses should be considered, specifically in high crime areas.

1.3 *Permanently close or heavily fine outlets that repeatedly violate liquor laws* – such violations could include selling alcohol to minors or continued service to intoxicated patrons (Zhu, Gorman & Horel, 2004). Under-pricing alcohol and non-compliance with safe serving practices can also be seen as violations requiring remediation.

1.4 *Regularly review operational liquor licensing policies* - government agencies and community planners with authority over land-use and/or liquor licenses can help deter crime and reduce violence by controlling the physical location of alcohol licensees. This process also gives establishments incentives to run their business according to the guidelines suggested by the Alcohol Gaming Commission of Ontario (AGCO), and introduces penalties for not abiding. Public Health and non-governmental organizations could seek involvement in this review process.

1.5 *Impose strict mandatory insurance requirements to operate a licensed establishment* – bars and clubs should have to apply for and receive specific and comprehensive insurance coverage relating to bar security, server training, and other safety measures specific to their type of business. They must meet the requirements on an ongoing basis to remain insured.

Strategy 2: Addressing Pricing and Taxation

The price of alcohol can be manipulated through excise tax policies. Findings regarding the close relationship between alcohol price and consumption clearly provide direction for policy-makers interested in reducing alcohol consumption and related violence. Public Health can work with relevant stakeholders and government departments to effect change in this area. Recommendations include:

2.1 *Increase the full price of alcoholic beverages* - a number of studies have found that such a price increase is an effective means of reducing alcohol-related violence (Chaloupka, Grossman & Saffer, 2002).

2.2 *Price alcohol based on the percentage of alcohol* - the Centre for Addiction Research of British Columbia (CARBC) proposed that the price of alcohol be reflective of the actual percentage of alcohol per serving. This theory gives price-conscious consumers an incentive for making more informed and responsible alcoholic drink purchases.

2.3 *Introduce a tax levy* - the concept of governments introducing a levy on establishments which sell alcohol after regular business operating hours is another concept worth exploring. Such concepts have been proposed throughout the United Kingdom, however, little data exist about the effectiveness of such initiatives.

Strategy 3: Restricting Hours and Days of Alcohol Sales

Restricting hours and days of sales has been a widely used alcohol policy instrument to regulate alcohol availability and curb alcohol-related problems. Babor et al. (2003) ranked such interventions as the third most effective strategy among 31 policies. Public Health can work with relevant stakeholders and government departments to effect change in this area. Recommendations include:

3.1 *Restrict hours of sale* – this is seen as an effective public health measure, more so than the extension of hours, and is consistent with the literature that links alcohol availability with violence (Parker, 2004). Restrictions on hours of sales can be set in private venues (e.g., bars and night-clubs), government-run venues (e.g., LCBO outlets), and government-directed venues (e.g., The Beer Store, The Wine Store).

3.2 *Restrict days of sale* – restrictions on days of sale can be set in private venues, government-run venues, and government-directed venues. Restrictions might include omitting service on Sundays, or a similar proposal that would decrease sales, and therefore, consumption.

3.3 *Consider the effects of other municipalities* - policy makers must be cognizant of neighbouring municipalities with relaxed alcohol control measures (e.g., privatized alcohol sales systems and a different minimum age for alcohol consumption). For example, municipalities bordering Quebec, Aboriginal lands, or cities in the U.S. should be considered carefully when introducing healthy public policy.

Strategy 4: Modifying the Drinking Context/Addressing the Built Environment

As recommended by the National Thematic Workshop on Alcohol Policy held in Ottawa in 2004, “addressing drinking context” means focusing on areas where harms occur as a result of alcohol use – bars, homes, recreational events, non-licensed areas, etc. Furthermore, physical and social predictors of bar violence offer considerable potential for reducing violence within licensed premises, since they are under the control of management and are relatively easy to regulate (Briscoe & Donnelly, 2003). Public Health can work with relevant stakeholders and government departments to effect change in this area. Recommendations include:

4.1 *Address the physical characteristics of venues where alcohol is sold* - this may include changing the flow of traffic within bars, improving the handling

and security of intoxicated patrons, using appropriate lighting, minimizing trip hazards, etc.

4.2 *Limit the number of intoxicated patrons within such venues* - research has shown that the frequency of violent behaviour increases with the level of intoxication of patrons (Chikritzhs & Stockwell, 2002). Key environmental and management changes aimed at reducing violence were observed in a study evaluating an intervention designed to make licensed venues safer. Such changes included improved comfort, availability of public transportation, less overt sexual activity, and fewer highly intoxicated men (Homel et al., 2004).

Strategy 5: Increasing Policing and Enforcement

Briscoe & Donnelly (2003) report that a minority of licensed premises account for the majority of assaults in bars. Public Health can work with relevant stakeholders and government departments to effect change in this area. Recommendations include:

5.1 *Target high-risk areas* – as suggested by Briscoe & Donnelly (2003), "violence on licensed premises could be substantially reduced by targeting limited law enforcement resources to high-risk premises" (p. 29).

5.2 *Target late-night venues* - Briscoe & Donnelly (2003) demonstrated that assaults on licensed premises in inner-urban areas were not evenly distributed across time but were concentrated late at night or early in the morning and on weekends. Based on this finding it may be useful to increase enforcement units in areas which have a high number of nightclubs and bars operating late hours and ensure enough public transit options around the times bars stop serving.

5.3 *Mandate evaluated server and security staff training* – CAMH's program, titled *Safer Bars,* provides training that increases "bar staff's ability to work as a team to reduce the risk of customers becoming aggressive, violent or injured" (CAMH, 2009; Graham et al., 2004). Such programs have been shown to be effective in preventing violence and injuries. Similar programs, such as SMART SERVE, must be evaluated for their effectiveness and feasibility.

5.4 *Increase the number of provincial liquor inspectors* – currently there are approximately 55 provincial liquor inspectors across Ontario. There are approximately 16,720 liquor licensed establishments which sell and serve beverage alcohol in Ontario (Behnood, 2009). A substantial increase in enforcement personnel would assist in preventing and mediating over-consumption of alcohol and resultant harm (OPHA, 2008).

Strategy 6: Utilizing Education and Persuasion Strategies

Public education campaigns can be employed to challenge social norms and counter the acceptability of alcohol-related violence. Some provinces and other countries have initiated education campaigns with some success. Public Health can work with relevant stakeholders and government departments to effect change in this area. Recommendations include:

6.1 Develop evidence-informed educational campaigns - any educational campaign should be part of a more comprehensive health promotion approach involving the 'four pillars' of health promotion theory. For most effective results, members of the target audience should be recruited and engaged throughout the development and implementation process to ensure that messaging is relevant, appropriate, and timely.

Strategy 7: Implementing a Violence Management System

The collection of needed data has successfully occurred in other countries – primarily in the form of Emergency Department injury data – and is used to inform and create violence prevention initiatives (Warburton & Shepherd, 2006). This is expected to reduce the number of alcohol-related assaults seen in the Emergency Department. Public Health can work with relevant stakeholders and government departments to effect change in this area. Recommendations include:

7.1 Develop a violence management system – the collection of such data may involve the use of Geographic Information System (GIS) technologies by local authorities, public health staff, and enforcement officials who work on violence prevention initiatives. In the same manner, these data can be useful to police for identifying locations where violence and crime are concentrated, and thus, focus the development and implementation of violence prevention initiatives (Warburton & Shepherd, 2006).

Strategy 8: Supporting a Provincial Alcohol Strategy

CAMH is the lead agency in initiating the formation of a provincial alcohol strategy. To date however, such a strategy has not been implemented. Public Health can work with relevant stakeholders and government departments to effect change in this area. Recommendations include:

8.1 *Support a provincial alcohol strategy* – the Government of Ontario could look to other provinces which have implemented alcohol strategies. British Columbia (Public Health Approach to Alcohol Policy: An Updated Report from the Provincial Health Officer) and Nova Scotia (Changing the Culture of Alcohol Use in Nova Scotia), have begun to curb alcohol and substance misuse in order to reduce alcohol-related harm.

8.2 *Support a provincial violence prevention strategy* – the OPHA hosts a Violence Prevention Workgroup that provides direction to violence prevention initiatives. The Government of Ontario, along with community partners, could support such a workgroup in developing a provincial violence prevention strategy.

While the majority of the 21 recommendations focus on the controls of alcohol, it is likely that these measures will be sufficient to effectively curb alcohol-related violence. A comprehensive health promotion approach should engage the four important ‘pillars’ of health promotion theory cited below, which balances public order and public health in order to create a safer, healthier community (Smythe & Caverson, 2008).

- *Prevention* – such efforts may include the development and implementation of educational initiatives, social marketing campaigns, curriculum-based resources, and educational advertisements and packages. Such resources can be created to increase awareness, enhance education, and shift social norms around the topic of alcohol and violence.

- *Treatment* – relevant groups, such as Addictions Ontario and the Centre for Addiction and Mental Health (CAMH) already conduct relevant and timely research, while offering needed services on addiction and harm issues. Various local agencies also address alcohol and violence issues from an addiction and treatment perspective.

- *Harm reduction* – the introduction of harm reduction principles should focus on high-risk groups. This may include addressing the physical environments of bars and clubs, introducing server and security staff training, and providing travel alternatives from bars and clubs at reduced costs.

- *Enforcement* - the protection and regulation of provincial laws is an important component of health promotion. Agencies which typically provide these roles may include municipal and provincial police services, the Alcohol and Gaming Commission of Ontario (AGCO) enforcement officers, private security firms, etc.

Health promotion action concepts introduced in the Ottawa Charter may also be utilized with the ‘four pillars’ to strengthen health promotion approaches (WHO, 1986). Such concepts may include:

- *Building healthy public policy* – an important step is the development, implementation, enforcement, and evaluation of policy in relation to alcohol and violence. “Health promotion policy combines diverse but complementary approaches including legislation, fiscal measures, taxation and organizational change” (WHO, 1986). The process of developing such policies should be ongoing and inclusive of all relevant stakeholder groups.

- *Strengthening community action / engaging in community mobilization* – various stakeholders can be mobilized in planning public health interventions. "At the heart of this process is the empowerment of communities - their ownership and control of their own endeavours and destinies" (WHO, 1986). In relation to alcohol and violence, those who are interested and engaged include regional and/or provincial police services, AGCO enforcement officers, politicians, bar owners, management, and employees, business improvement associations, addiction services, community action groups, non-government organization's and the general public.

Please note: A detailed listing of current Ontario alcohol policies are provided in Appendix E to provide current context in regards to this topic area. In addition, the OPHA hosts a Violence Prevention Database of provincial public health programming, as well as position papers and resolutions on violence. Visit www.opha.on.ca to access these resources.

6.0 Conclusion

While violence depends on a wide variety of complex factors, this research report illustrates the important role that alcohol plays in the generation of violence. With this knowledge, it is important to recognize that analyzing patterns of alcohol consumption alone may not provide enough context in which alcohol consumption and violence occur. Therefore, a host of variables should be considered when addressing and planning interventions related to alcohol and violence.

Future research in the area alcohol-related violence prevention is needed to determine how drink specials, discounted drinks, drink sizes, venue capacity, and venue style may be related to bar violence. Spatial analysis of bar locations would also provide more information about the alcohol-violence link. In addition to the list of physical and social factors that contribute to violence, future policy development would benefit from identifying good management practices as it relates to reducing violence.

The literature reviewed clearly indicates that effective alcohol control policies can help control alcohol-related violence. We have outlined eight strategies and 21 recommendations that can be acted on to help control alcohol-related violence. These strategies involve a comprehensive health promotion approach and engage the ‘four pillars’ of health promotion theory. There is a strong place for Public Health to work with relevant stakeholders and government agencies to effect the changes necessary to reduce alcohol-related harm.

To this end, the development, implementation, and evaluation of evidence-informed interventions – including the introduction of alcohol policy as well as the support and development of a provincial violence prevention strategy – will play a positive role in mediating violence.

Appendix A: List of Internet Search Sources

Source	Website
Alcohol Policy Network (APN)	www.apolnet.ca/Index.html
Association of Local Public Health Agencies (alPHa)	www.alphaweb.org/
Canadian Centre on Substance Abuse (CCSA)	www.ccsa.ca
Canadian Institute for Health Information (CIHI)	www.cihi.ca
Centre for Addiction and Mental Health (CAMH)	www.camh.net
Centre for Addictions Research of British Columbia (CARBC)	www.carbc.ca/
Health Canada	www.hc-sc.gc.ca
Liquor Control Board of Ontario (LCBO)	www.lcbo.com
Ontario Injury Prevention Resource Centre (OIPRC)	www.oninjuryresources.ca
Ontario Public Health Association (OPHA)	www.opha.on.ca
Public Health Agency of Canada (PHAC)	www.phac-aspc.gc.ca
Statistics Canada	www.statcan.gc.ca
St. Michael's Hospital	www.stmichaelshospital.com
World Health Organization (WHO)	www.who.int/en/

Appendix B: Data Extraction Form

Title:
Reviewer:
Source:
Author(s):

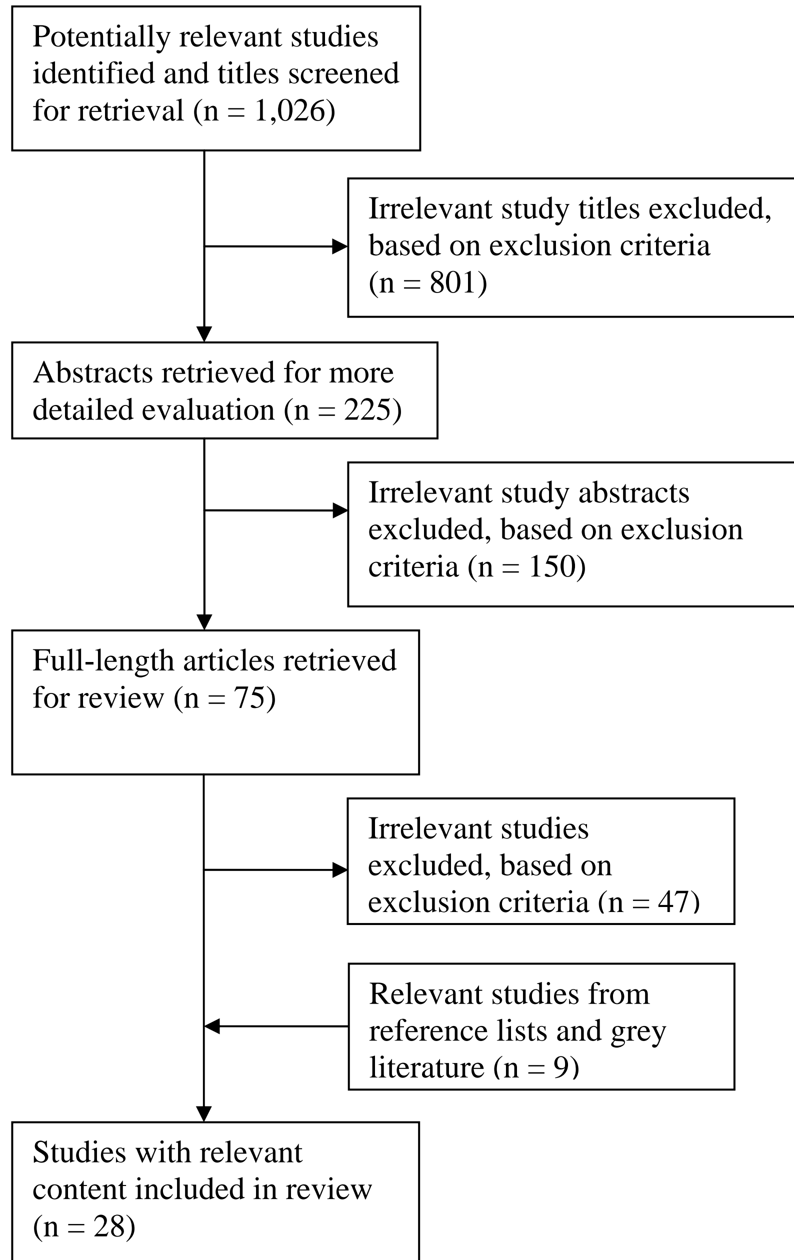
Study Characteristics

Year of publication	
Country of origin	
Objective	
Methodology	
Results	
Conclusion	
Type of Document and/or Type of Study	
Population studied	
Role/measure of alcohol	
Definition or measure of violence	
Relevant Quotations:	
Limitations:	

Appendix C: Library Search Results

Database	**No. Hits**	**No. Titles Chosen**	**No. Abstracts Chosen**	**No. Articles Used**
PubMed	163	51	19	12
Web of Science	455	105	19	9 (7 overlap with PubMed)
Social Sciences Citation Index (SSCI)	285	40	24	9 (2 overlap with Web of Science and 2 overlap with PubMed)
CSA: Sociological Abstracts	112	28	13	2 (2 overlap with SSCI)
Violence and Abuse Abstracts	11	1	0	0
Reference Lists	-	-	-	8
Grey Literature	-	-	-	1
Total	**1,026**	**225**	**75**	**28**

Appendix D: Flow Chart of Included Studies



Appendix E: Alcohol Policy in Ontario, Canada

Advertising restrictions: There are no restrictions on advertising liquor. Alcohol may be advertised outside the establishments through national television, national radio, print media, and billboards. There are also no restrictions for health warnings on advertisements (WHO, 2004). However, there are restrictions on irresponsible alcohol advertising. For instance, the use of terms like “Happy Hour” or “Cheap Drinks" that promote immoderate consumption is prohibited (AGCO, 2009).

Age restrictions: The age at which young people are allowed to purchase and drink in Canada is regulated by legislation and enforcement policy in each province and territory. Currently, in most provinces and territories the minimum drinking age is 19 years (AGCO, 2009; Ray et al., 2008; WHO, 2004). The exceptions are Quebec, Manitoba and Alberta, where the minimum drinking age is 18 years.

Alcohol consumption: Alcohol consumption is completely banned from public transport, parks, and streets but only partially or voluntarily banned from other settings (WHO, 2004).

Alcohol tax: In Ontario, there is a 10% sales tax applied to alcohol purchased from licensed establishments. By comparison, the regular sales tax in Ontario is 8% (AGCO, 2009).

Blood alcohol limit for drivers: It is an offence to drive with a blood alcohol content (BAC) of .08% or greater, and to drive while impaired even if one's BAC is less than .08%. All provinces and territories have introduced roadside and/or administrative license suspensions to take effect almost immediately after a driver registers a BAC over the statutory limit or fails to provide a breath sample (Canadian Centre on Substance Abuse, 2008). In Ontario, a three-day license suspension exists for drivers caught with a BAC between 0.05% and 0.08% (Canadian Centre on Substance Abuse, 2008).

Hours and days of alcohol sales: In Ontario, the hours that alcohol can be offered for sale are regulated, but not which days of the weeks. Liquor may be sold and served in licensed establishments on any day of the week from 11 a.m. to 2 a.m. (AGCO, 2009).

Retail sale: In Ontario, most alcohol is sold through retail outlets run by the provincial government. According to the LCBO Annual Report (LCBO, 2008) over half (53%) of the alcohol sold in Ontario was through privatized means. These privately owned alcohol outlets are still regulated by the AGCO, which administers the specific rules and regulations of alcohol sales, service and consumption outlined in the Liquor License Act (AGCO, 2009).

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