Effective Interventions to Reduce Alcohol-related Harm in Licensed Establishments: A Rapid Review of the Literature

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Region of Peel
Working for you

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Key Messages

1. Multicomponent programs, which include partnerships with key stakeholders, community mobilization, server training, policies for licensed establishments and stricter police enforcement, were effective in reducing assaults, traffic crashes, alcohol consumption and injury. They had no effect in reducing sales to underage patrons.
2. Server training increased server knowledge and reduced single vehicle nighttime crashes. Server training showed mixed results in changing server practice, refusal of sales to intoxicated patrons, alcohol consumption, and patron aggression. Server training showed no effect in reducing sales to underage patrons.
3. Peel Public Health should map out the mandates and roles of public health, police, and the Alcohol Gaming Commission of Ontario (AGCO) and collaborate with these partners in working with licensed establishments to prevent and reduce alcohol related harm.
4. Peel Public Health should explore whether current police enforcement efforts are sufficient in preventing alcohol related harm in the current context. Peel Public Health should advocate for additional plainclothes officers from enforcement agencies entering bars and restaurants to cite servers and owners providing alcohol to intoxicated patrons as need indicates.

Executive Summary

Issue and Context

This rapid review was conducted to identify effective interventions to reduce alcohol-related harm in and around licensed establishments. The results will be used to inform our work in Peel, and in Ontario through the Ontario Safer Bars Network.

Research Question

"What interventions reduce alcohol-related harm in and around licensed establishments?"

Search Strategy

Academic and grey literature with a date limitation of 2000-2013 was searched, yielding 132 potentially relevant documents. Following the primary and secondary relevance assessments, four documents were selected and critically appraised: one book chapter and three systematic reviews. The two systematic reviews with the most recent evidence and stronger critical appraisal ratings were chosen for this rapid review.

Synthesis of Findings

The findings of this rapid review are limited by the quality of included studies in the two systematic reviews. The syntheses of these systematic reviews were predominately narrative due to the variation in participants, interventions and outcomes and the overall quality of their included studies.

Across the two reviews, four types of interventions were identified, namely server training, police and enforcement, multicomponent programs and health promotion programs. Multicomponent programs are programs that combine several of the following components; community mobilization, responsible beverage service

training, house policies and stricter enforcement of licensing laws. Outcomes assessed across the two reviews were: server and patron knowledge, change in server practice, sales to underage patrons, refusal of sales to intoxicated patrons, alcohol consumption, patron aggression, drinking and driving, and injury.

Server training increased server knowledge and reduced single vehicle nighttime crashes. There was mixed evidence on the impact of server training on changing server practice, refusal of sales to intoxicated patrons, alcohol consumption and patron aggression. Server training showed no effect on sales to underage patrons. Police and enforcement interventions produced a decrease in alcohol sales to underage patrons and an increase in servers refusing alcohol sales to intoxicated patrons.

Multicomponent programs were effective in reducing assaults, traffic crashes, alcohol consumption, and injury. Health promotion programs showed mixed results in reducing alcohol consumption and drinking and driving. Health promotion programs had no effect in increasing server or patron knowledge or in changing server practice.

Conclusion and Recommendations

Overall, multicomponent programs, with long term commitment, that combine community mobilization, mandatory server training, house policies and police enforcement are the most promising in reducing assaults, traffic crashes, alcohol consumption, and injury. Mandatory server training for those working in licensed establishments should continue. Plainclothes officers from enforcement agencies citing servers, managers and owners of licensed establishments providing alcohol to intoxicated patrons would provide additional motivation for licensed establishments to follow responsible beverage serving practices.

1 Issue

In Peel Region and Ontario, there is a growing concern about alcohol-related harm occurring in and around licensed premises. Of particular concern is alcohol consumption, among young people, who are more likely to binge drink[1]. There is also increasing evidence demonstrating that, patron demographics, their level of intoxication and the environmental characteristics of the licensed establishments can contribute to alcohol-related harm in and around licensed establishments[2].

Peel Public Health is a co-founder and chair of the Ontario Safer Bars Network (OSBN), a collaborative network committed to reducing alcohol-related harm associated with licensed establishments. In October 2012, the OSBN key stakeholders endorsed the OSBN's strategic plan. Embedded in the strategic plan are the identification, synthesis and dissemination of evidence-informed strategies to reduce alcohol-related harm in and around licensed establishments. This was the impetus for this rapid review. For the purpose of this review, the term "alcohol-related harm" includes excessive alcohol consumption, underage alcohol sales, patron aggression including assaults and violent crime, and road traffic crashes as a result of drinking and driving. The results will be used to inform our work in Peel, and in Ontario through the OSBN.

2 Context

Age, gender, culture and drinking location impact patterns of alcohol use and harm[3]. In 2011/2012, 48% of Peel residents, 12 years of age and over, reported that they drank one or more alcoholic drinks per month in the past 12 months; these are considered current drinkers. Of these, 19.5% report binge drinking in the last year,

meaning they consumed more than 5 drinks on one occasion. Men were significantly more likely than women (26% vs 11%) to report episodes of binge drinking[5]. Forty two percent of current drinkers between the ages of 19-29 reported binge drinking in the past year. This age group had the highest rate of binge drinking, followed by the 30–39 year old group at 20%[5].

There are limited data on alcohol-related harms in Peel, particularly reported injuries and accidents due to alcohol occurring in and around licensed establishments. Estimating alcohol-related incidents is difficult due to underreporting and the reality that alcohol is not always stated as a factor in hospital or emergency department (ED) visits. Men have higher rates of injury/accidents; they are more likely to engage in risk-taking behaviour, even when alcohol is not a factor. In 2006, the rate of alcohol-related ED visits for young adults in Peel aged 15-24 years was 325.4 for men and 181.8 for women per 100,000[4]. Data gathered over a two-year period in 2009/2010 revealed that 5% (28,600) of Peel drivers surveyed reported that during the past 12 months they consumed two or more drinks in the hour before they drove[5]. This is consistent with the provincial results of 6% for Ontario drivers[5].

The prospect for crime, disorder, violence and traffic accidents resulting in injury or death increases with the level of alcohol consumption and the degree of alcohol-related impairment[2,3]. As a standard practice, lead trauma hospitals test the blood alcohol content (BAC) of trauma patients who are older than 10 years of age, if they are admitted within 12 hours of the trauma incident. In 2009/2010, 12.8% (543) of the patients on the Ontario Trauma Registry had a BAC ≥ 0.08mg% which means there is 0.08g of alcohol for every dL of blood. A BAC ≥ 0.08%mg is the legal definition of being intoxicated. Among these patients, 46% (248) were admitted due

to motor vehicle collisions, 26% (142) were admitted due to unintentional falls, and 23% (123) were admitted for injury purposely inflicted by another person[6].

A 2002 survey of Ontario adults, asking about their most recent incident of physical aggression during the past 12 months, found that in over 50% of incidents the respondent, the main opponent or both had been drinking[7]. In addition, 30% of aggression incidents occurred in or around licensed premises[8].

This rapid review supports our work under the Chronic Disease and Injuries Program Standards, part of the Ontario Public Health Standards, specifically related to policy development, health promotion and building community capacity acknowledging alcohol as a risk factor for both chronic diseases and injuries.

Excessive drinking combined with environmental and patron demographic characteristics can exacerbate the potential for alcohol-related harm[2,3]. This rapid review will inform one of the program priority areas of the Substance Misuse and Injury Prevention (SM/IP) team, which is identifying effective strategies to reduce alcohol-related harm among young adults aged 17-24. Heavy drinking among this population is at an elevated level and the SM/IP team is identifying policies and strategies to lower this rate. This rapid review will also contribute to the OSBN's future programing related to licensed establishments, mitigating alcohol-related harm such as patron aggression, assaults, violent crime, road traffic crashes as a result of drinking and driving, injury and death throughout the province.

3 Conceptual Framework

Common interventions among licensed establishments are expressed in a conceptual model that includes four types of interventions from the literature (see Appendix A): 1) patron-focused programs, 2) Enhanced Enforcement, 3) server

training programs, and 4) multicomponent programs that include a combination of community mobilization, responsible beverage service training, house policies, and stricter enforcement of liquor laws. The aim of each intervention is to reduce alcohol-related harm among patrons and staff in licensed establishments and in the surrounding community.

4 Literature Review Question

The research question for the literature review was: “What interventions reduce alcohol-related harm in and around licensed establishments?” The PICO format was used to create the search question:

- **P**opulation – Alcohol consumers, bar patrons
- **I**ntervention – Any intervention in or around licensed establishments
- **C**omparison – No comparison
- **O**utcome – Alcohol-related harm (e.g., server and patron knowledge, change in server practice, sales to underage patrons, refusal of sales to intoxicated patrons, alcohol consumption, patron aggression, drinking and driving, and injury.).

5 Literature Search

In February 2013, we conducted a search of the literature with a date limitation of 2000 – 2013. The following electronic databases were searched: EBM Reviews, Cochrane Database of Systematic Reviews, Global Health, Ovid Medline, PsycINFO, Centre for Reviews and Dissemination, Psychology and Behavioural Sciences Collection, SocINDEX, and CINAHL Plus. Grey literature sources searched included the Centers for Disease Control and Prevention, the National Institute for Health and

Care Excellence, and the TRIP Database. Additional searches were performed on Google Scholar and other relevant websites (i.e., Health-Evidence.org, World Health Organization, and Public Health Agency of Canada). The complete search strategy with the search terms used may be found in Appendix B.

6 Relevance Assessment

Two reviewers independently assessed article titles and abstracts to determine relevance. To resolve discrepancies, the reviewers held discussions to reach a mutual decision. For inclusion, articles had to meet the following criteria:

- Synthesized evidence (e.g., guidelines, summaries, systematic reviews)
- Measured alcohol-related harm reduction
- Assessed interventions in licensed establishments in developed countries
- Published in English language publications from 2000 to 2013.

7 Results of the Search

The search identified 132 potentially relevant documents. Seven were excluded as duplicates, leaving 125 for primary relevance assessment. Following primary relevance assessment, 108 were excluded and 17 were retrieved for full text review. Following full text review, four documents were deemed relevant: one book chapter and three systematic reviews. Refer to Appendix C for the literature search flowchart.

8 Critical Appraisal

The three systematic reviews were appraised using the Health-Evidence Quality Assessment Tool and its companion dictionary. The book chapter was appraised using an internal Peel Public Health critical appraisal tool developed for

textbooks/books. All four documents were appraised independently by three reviewers. Disagreements were resolved through discussion with a fourth reviewer.

Two systematic reviews received a strong rating. The book chapter and one systematic review received a moderate rating. Both documents contained many of the same primary articles as the two systematic reviews that received strong ratings. The review authors decided to exclude the book chapter and the moderately rated systematic review article, leaving the two systematic reviews with the most recent evidence and stronger rating for this review.

9 Description of Included Studies

Jones et al. (2011) Reducing harm in drinking environments: A systematic review of effective approaches

The 39 studies included in Jones et al. (2011) examined the effectiveness of interventions in alcohol serving environments in reducing alcohol-related harm. The studies were published between 1993 and 2006. Eleven of the 39 studies evaluated the same programs, so they were grouped together with their original studies and treated as one study. The review authors did a full quality assessment on the remaining 28 studies. Three studies scored high, nine had moderate scores and 16 studies scored poorly using the quality assessment tools. Eleven studies were carried out in the US, nine in Australia and eight in Sweden, UK and Canada. The authors narratively combined the results of the 28 studies.

Seven studies included interventions with mandatory or voluntary responsible beverage server training programs for servers and management, and enhanced beverage service house policies. Eight studies examined the effectiveness of targeted police presence in and around licensed establishments and increased police

enforcement of drinking regulations. Nineteen studies examined the impact of seven multicomponent programs that included 1) community mobilization, 2) partnerships with key stakeholders, 3) server training, 4) policies for licensed establishments, and 5) police enforcement. The remaining five studies evaluated the effectiveness of designated driving programs (2 studies), responsible drinking campaigns including the use of breathalyzers (2 studies) and personalized risk assessment accompanied by brief alcohol intervention (1 study). One study, that was not relevant to this review, evaluated the type of glassware used in licensed establishments with respect to injury to servers.

The outcomes measured in the 28 studies included changes in server/patron knowledge, changes in server practice, changes in alcohol consumption among patrons, sales to underage and intoxicated patrons, drinking and driving charges, rates of alcohol-related crashes, and alcohol-related violence and aggression. Jones et al. report that the findings are limited by the methodological quality of the included studies.

Ker, K and Chinnock, P. (2010) Interventions in the alcohol server setting for preventing injuries (Cochrane Review)

The 23 studies in Ker and Chinnock (2010) examined the effectiveness of interventions aimed at reducing injuries among their patrons and servers in licensed serving outlets such as retailers, pubs, restaurants and areas of multiple licensed alcohol serving outlets (e.g. towns, bar districts). The studies, published between 1987 and 2008, were conducted in six countries: 12 in the USA, five in Australia, two in Canada, two in Sweden, one in South Africa and one in the UK. Ker and Chinnock judged the overall quality of the included studies to be weak. The studies were varied

in terms of participants, interventions and outcomes. The authors calculated odds ratios and the mean differences for the randomized controlled trials. The remaining studies were combined narratively.

Fifteen studies evaluated the effectiveness of server training programs. Five studies evaluated the effectiveness of responsible drinking information distributed in licensed establishments (2 studies), responsible beverage management policies and interventions in serving premises (2 studies), and driving services for intoxicated patrons (1 study).

Two studies were not included in the analysis for the systematic review because the data were unusable. This review also included the study on glassware used in licensed establishments with respect to injury that was included in Jones et al.

The outcomes measured in this review included injury, server behaviour, patron behaviour and changes in knowledge.

10 Synthesis of Findings

Eleven single studies were found in both systematic reviews, leaving a total of 40 unique studies. The results of the two reviews have been synthesized and are shown in Appendix E**.** This synthesis table is further condensed and shown in Table 1**.** The table includes the findings of four types of interventions namely server training, police and enforcement, multicomponent programs and health promotion programs. Outcomes assessed across the two reviews were: server/patron knowledge, change in server practice, sales to underage patrons, refusal of sales to

intoxicated patrons, alcohol consumption, patron aggression, drinking and driving, and injury.

Overall, server training increased server knowledge and reduced single vehicle nighttime crashes. There was mixed evidence on the impact of server training on changing server practice, refusal of sales to intoxicated patrons, alcohol consumption and patron aggression. Server training showed no effect on reducing sales to underage patrons. Police and enforcement interventions produced a decrease in alcohol sales to underage patrons and an increase in servers refusing alcohol sales to intoxicated patrons. Multicomponent programs combining community mobilization, server training, house policies, and stricter enforcement of licensing laws were effective in reducing assaults, traffic crashes, alcohol consumption, and injury. Health promotion programs showed mixed results in reducing alcohol consumption and drinking and driving. These programs had no effect in increasing server or patron knowledge or in changing server practice.

Table 1: Effectiveness of interventions in licensed establishments to reduce alcohol-related harm

Outcomes	Intervention Type			
	Server Training Programs (n=16 studies)	Police and Enforcement Programs (n=7 studies)	Multicomponent Programs (n=19 studies evaluating seven programs)	Health Promotion Programs (n=7 studies)
Server/Patron Knowledge	↑ **(4 studies)**	**N/R**	**N/R**	↔ **(1 study)**
Change in Server Practice	↑ **(3 studies)** ↔ **(4 studies)**	**N/R**	**N/R**	↔ **(1 study)**
Sales to Underage Patrons	↔ **(1 study)**	↓ **(1 study)**	↔ **(2 programs; 4 studies)**	**N/R**
Refusal of Sales to Intoxicated Patrons	↑ **(2 studies)** ↔ **(5 studies)**	↑ **(1 study)**	↑ **(1 program; 3 studies)** ↔ **(1 program; 1study)**	**N/R**
Alcohol Consumption	↓ **(2 studies)** ↔ **(6 outcomes in 4 studies)** ***(4 studies total)***	**N/R**	↓ **(2 programs; 10 studies)** ↔ **(1 program; 3 studies)**	↓ **(2 studies)** ↔ **(2 studies)**
Patron Aggression	↓ Severe aggression ↔ All aggression ***(1 study total)***	↓ **(1 study)** ↔ **(3 studies)**	↓ **(3 programs; 6 studies)** ↔ **(1 program; 3 studies)**	↔ **(1 study)**
Drinking and Driving	↓ **(1 study)**	↓ **(1 study)** ↔ **(2 outcomes in 2 studies)** ***(2 studies total)***	↓ **(4 programs; 4 outcomes)** ↔ **(1 program; 1 outcome)** ***(7 studies total)***	↓ **(1 study)** ↔ **(4 outcomes in 2 studies)** ***(3 studies total)***
Injury	**N/R**	**N/R**	↓ **(1 study)**	↓ **(1 outcome in 1 study)** ↔ **(1 outcome in 1 study)** ***(1 study total)***

N/R: not reported in either systematic review; ↑ significant increase P<0.05, ↓ significant reduction P<0.05; ↔ no change or non-significant change relative to control; * Significant effect and no effect were found in some single studies, italics represents total number of studies addressing the outcome.

Server Training

Non-mandated server training interventions ranging from one hour to one full day increased server knowledge; mandated server training reduced single vehicle nighttime crashes. There was mixed evidence on the impact of server training on changing server practice, refusal of sales to intoxicated patrons, alcohol consumption and patron aggression. Based on one study, server training showed no effect on reducing sales to underage patrons. Both Jones et al. (2011) and Ker and Chinnock (2010) concluded that mandating server training and ensuring management support for server training would enhance the likelihood of decreasing alcohol-related harm.

Server Knowledge

Four single studies examined the impact of server training interventions on server knowledge. All four studies noted a significant increase in server knowledge following server training. One of the studies noted a mean score increase of 1.30 to 5.29 on pre to post test scores. A second study reported an increase in the mean total knowledge score from 23.98 to 30.80. The clinical significance of these increases in test scores was not reported by the review authors (Ker and Chinnock, 2010).

Changes in Server Practice

Seven single studies examined changes in server practice following server training (four included in both reviews; three in Ker and Chinnock, 2010 only). Two reported increases in responsible beverage serving behaviours. One of these studies reported an increase in the experimental site behaviour scores from 15.0 to 21.5 pre to post training, compared to the control site's scores of 16.5 to 16.4 during the same time period. The second study reported a self-reported mean score change in server practice of 3.13 to 3.50 and changes in observed server behaviour in mean scores from 0.19 to 0.34 between the pre and post training period. The clinical significance of these

changes in test scores was not reported in the review. A third study reported an increase in the frequency of servers intervening on patrons' drinking. Four studies did not find any changes in server practice.

Sales to Underage Patrons

One non-randomized case controlled clinical trial evaluated one-on-one consultations with owners/managers of bars with a focus of changing server practices including sales to minors. Results of the study showed no effect on reducing sales to underage patrons.

Refusal of Sales to Intoxicated Patrons

Seven single studies examined the impact of server training on refusal of sales to intoxicated patrons (four included in both reviews; three in Ker and Chinnock, 2010 only). Two studies showed a positive effect of servers refusing to sell alcohol to intoxicated patrons. One of these studies, measuring observed server behaviour to 'real' intoxicated patrons, reported that the mean intervention scores increased from 0.03 to 0.22 after the training. The control sites remained unchanged at 0.07 across the same time period. This was described as a low frequency of server intervention in one of the reviews. The second study reported a lower average exit BAC of 0.059 mg% for 'pseudo' patrons who were served by trained servers compared to patrons who were served by untrained servers (BAC of 0.103 mg%). Five of these studies showed no effect.

Changes in Patrons' Alcohol Consumption

Four studies examined the effect of server training interventions on patrons' alcohol consumption (two included in both reviews; two reported in Ker and Chinnock, 2010 only). Two of these studies noted a decrease in patrons' alcohol consumption,

with one of these studies noting a 26% decrease in the proportion of patrons with BAC greater than 0.08 mg% and no change in the proportion of patrons with BAC greater than 0.15 mg%. Three studies reported no effect on the proportion of patrons with BAC greater than 0.10 mg% and on overall alcohol consumption.

Drinking and Driving

One study, included in both reviews, examined the effect of server training on drinking and driving. Jurisdictions with mandated server training that included the effects of alcohol on the body, interaction effects of alcohol with other drugs, problem drinking and alcoholism, drinking and driving laws, liability issues, effective server intervention techniques, and alcohol marketing practices for responsible alcohol service were likely to have half as many single vehicle nighttime crashes compared to areas with no mandated server training (OR -0.524, 95% CI -0.956 to -0.091). In the analysis of the crash data, the reviews report a decrease of 4% after six months, 11% after 12 months, 18% after 24 months and 23% after 36 months in single vehicle nighttime crashes following the implementation of mandated server training.

Patron and Staff Aggression

One study, included in both reviews, examined the effect of server training on patron and staff aggression. In this Canadian study, 26 of 38 bars were randomly assigned to receive a three hour risk management training on preventing and managing patron and staff aggression. The remaining 12 bars served as the control group. Trained observers made 734 observations, six months prior to the intervention and six months after the intervention. Server training produced a significant decrease in severe physical aggression displayed by patrons compared to the control bars. The effect size was modest with an average decrease of 0.018 in the number of incidents in the

experimental sites and an average increase of 0.053 in the number of incidents in the control sites. Server training produced no effect on all severe and moderate patron aggression and no effect on staff aggression.

Police and Enforcement Interventions

Police and enforcement interventions produced a short term decrease in alcohol sales to underage patrons, a short term increase in servers refusing alcohol sales to intoxicated patrons and a 45% reduction in alcohol-related crashes among 16-20 year olds. Common police and enforcement interventions that were effective included: 1) server (with management) training and police enforcement checks, and 2) an increase in plainclothes officers from enforcement agencies entering bars and restaurants periodically to cite servers found serving alcohol to intoxicated patrons. All seven studies were reported in Jones et al (2011).

Sales to Underage Patrons

One study examined the effectiveness of police and enforcement interventions on the sale of alcohol to underage patrons. Enforcement checks had a short term impact on reducing underage sales in on-and-off premise establishments. No effect size was reported.

Refusal of Sales to Intoxicated Patrons

One study examined the effectiveness of plainclothes officers from enforcement agencies entering bars and restaurants periodically to cite servers found serving alcohol to intoxicated patrons. This study showed a short term increase in refusal of service to intoxicated patrons. No effect size was reported.

Patron and Staff Aggression

Four studies showed inconclusive evidence on the effectiveness of police and enforcement interventions to reduce patron aggression (e.g., assaults, violence, criminal

offenses, and alcohol-related incidents). One study that used targeted police operations as an intervention noted an increase of 'street assaults' of 34% in the intervention area compared to an 8% increase in the control area. However, the study further reported a decrease in assaults as reported using emergency department data to monitor assault rates. No effect size was reported. While the three remaining studies did not show an effect in decreasing patron aggression, Jones et al (2011) concluded that targeted police intervention of high-risk premises was more effective in decreasing alcohol-related incidents compared to low-level policing.

Drinking and Driving

Two studies examining two police and enforcement interventions showed mixed effects on the outcome of drinking and driving. One study, conducted at a border crossing between Mexico and the United States, evaluated the combination of a drinking and driving enforcement program and a media intervention. It found a 45% reduction in the number of alcohol-related crashes among 16-20 year olds during the intervention. However, no effect was found among 21-30 year olds. The second study, involving plainclothes officers citing servers who served alcohol to intoxicated patrons, showed no effect in reducing the percent of drinking and driving arrestees who reported consuming their last drink at a bar.

Multicomponent Programs

Well designed and well implemented multicomponent programs that combined community mobilization, server training, house policies, and stricter enforcement of licensing laws were effective in reducing assaults, traffic crashes, and alcohol consumption. There was no effect on alcohol sales to underage patrons. The Jones et al (2011) review identified seven community-based multicomponent programs reported

in 19 studies. The authors identified three of the programs that were particularly well designed and well implemented; the Community Trials project, the Stockholm Prevents Drugs and Alcohol Problems (STAD) project, and the Communities Mobilising for Change on Alcohol programme. The Community Trials project was a five year project and the STAD project was a 10-year project. The duration of the other programs were not noted by the authors.

Sales to Underage Patrons

Four studies that evaluated two multicomponent programs found no effect in reducing sales of alcohol to underage patrons. One of the programs used community mobilization to reduce youth access to alcohol. The review authors noted that there was a non-significant decrease in sales to minors. The second program used community mobilization, responsible beverage service training and law enforcement.

Refusal of Sales to Intoxicated Patrons

Four studies that examined the effect of two multicomponent programs had mixed results on the outcome of refusing service to intoxicated patrons. Three studies that evaluated a program involving community mobilization, responsible beverage service training, and enforcement of alcohol laws found an increase of 23% in the rate of servers refusing to serve alcohol. The remaining study, evaluating a program targeting sales of alcohol to intoxicated patrons, found no effect in service refusal.

Alcohol Consumption

Three multicomponent programs, evaluated by 13 studies, found mixed results on the outcome of alcohol consumption. One program, reported in eight studies, combined community mobilization, media advocacy, responsible beverage service training, enhanced enforcement efforts against drinking and driving and underage

drinking, and local restrictions on accessing alcohol, produced a 6% decrease in patrons' alcohol consumption. A second program, examined by two studies, used various environmental policies (e.g., responsible beverage service training and a ban on advertising) also found a decrease in alcohol consumption. No effect size was reported. The third program, reported in three studies, using community mobilization, had no effect among 18-20 year olds in having access to or consuming alcohol.

Patron Aggression

Seventeen studies, evaluating six multicomponent programs, found mixed results on patron aggression. One ten year-long program that combined community mobilization, responsible beverage service training, and increased enforcement of alcohol laws found a 29% decrease in violent crimes. A second program combining various environmental policies (e.g., responsible beverage service training and a ban on advertising) found a decrease in the occurrence of second hand effects of alcohol (e.g., insults, property damage, unwanted sexual advances, violence, and sleep deprivation). A third program combined community mobilization, responsible beverage service training and increased law enforcement and found a decrease in assaults reported to police and the Emergency Medical Service (EMS). The remaining ten studies evaluated three multicomponent programs and found no effect in decreasing patron aggression.

Drinking and Driving

Four programs evaluated by seven studies reported decreases in drinking and driving behaviours. One study evaluated a program that combined community mobilization, media advocacy, responsible beverage service training, increased enforcement of drinking and driving and underage drinking laws and restricted access to alcohol. This study revealed a decrease in single vehicle nighttime crashes and alcohol-

related crashes by 10% and 6% respectively. This same study also found a reduction in hospitalized assault injuries by 2%.

Two studies evaluated a second program that combined various environmental policies (e.g., responsible beverage service training and a ban on advertising) that also found a decrease in drinking and driving. A third program, reported in one study, combined community mobilization, responsible beverage service training, and increased law enforcement resulting in a decrease in motor vehicle accidents reported to the EMS. A fourth program evaluated by three studies, used community mobilization to reduce youth access to alcohol. It found a decrease in drunk-driving arrests among 18-20 year olds and no effect among 15-17 year olds.

Health Promotion Programs

Health promotion programs showed mixed results reducing alcohol consumption and drinking and driving. These programs had no effect in increasing server or patron knowledge or in changing server practice. Common elements of successful health promotion programs included: patrons receiving responsible drinking promotional material, patrons receiving brief interventions and free transportation between bars and clubs.

Server/Patron Knowledge and Change in Server Practice

One study evaluated the promotion of responsible serving practices at house parties on patron knowledge and changes in server practice (Ker and Chinnock, 2010). The study showed no effect in increasing community-wide knowledge. This study also showed no effect at increasing the incidence of party hosts refusing service, providing transportation, and serving non-alcoholic drinks and food.

Alcohol Consumption

Three studies reported on the outcome of alcohol consumption and showed mixed results. One study evaluated patrons receiving brief interventions and showed a reduction in alcohol consumption by identified harmful/hazardous consumers, a term used to describe those who drink excessively (Jones et al., 2011). A second study, reported in both reviews, evaluated patrons receiving responsible drinking promotions with an option to use a breathalyzer. The study showed a decrease in self-reported alcohol consumption (38g versus 47g). However, this study also showed no effect on decreasing the median alcohol consumption based on BAC tests and the percent of patrons with blood alcohol content greater than 0.10mg% and 0.15mg%. The final study showed no effect in reducing total number of drinks consumed among patrons in the establishment.

Patron Aggression

One study found in Ker and Chinnock (2010) evaluated a program that combined cover fees for patrons entering the establishment with increased enforcement of licensed establishment capacity and street laws (e.g., noise complaints, drinking in the streets, crowding, vandalism) and found no effect on reducing the rates of serious assaults. The authors noted that no test of significance was recorded for this study.

Drinking and Driving

Three studies, each evaluating one of three programs on the outcome of drinking and driving, have shown mixed results. One study evaluated patrons receiving free transportation between bars and clubs and showed a reduction after two weeks in the frequency of impaired driving (Jones et al., 2011). A second study, found in both reviews, evaluated a program promoting responsible drinking and found no effect in decreasing the percent of intoxicated patrons with the intent to drive. The third study

evaluated a designated driver program that was accompanied by a media campaign and found no effect on decreasing the frequency of being a passenger in a car with a driver with a BAC greater than 0.05mg% (Jones et al., 2011).

Injury

One study evaluated one program that used a free taxi service for patrons and found a 15% decrease in crashes causing injuries. However, this same study found no effect on decreasing fatal road traffic crashes (Ker and Chinnock, 2010).

11 Applicability and Transferability

In November 2014, a meeting was held to discuss the applicability and transferability of the findings of this rapid review to the Region of Peel and Ontario contexts. The meeting included representatives from the Research, Policy and Planning team, Tobacco and Workplace Health team in the Chronic Disease and Injury Prevention Division, along with representation from the Environmental Health and the Strategic Policy and Initiatives Division. This meeting was limited to our internal partners. Future meetings will be held with external partners to share the findings of this review. A summary of the meeting is presented below.

Applicability

Political Acceptability or Leverage

The group agreed that preventing alcohol-related harm would be generally supported from a political and public relations perspective. Participants noted the interventions directly focused on community safety, and that this would create a positive profile and image for Peel Public Health and other community partners. Some participants mentioned that addressing certain alcohol-related harms may receive more support than others, such as drinking and driving. Framing interventions may influence the level

of support by the public, politicians and stakeholders (i.e., OSBN). It was suggested that Brampton Safe City, a network of citizens, businesses, schools and community agencies working together with police, emergency services, government agencies and others to make the community as safe as it can be, would be an ideal champion in this regard. Given the changes in the political landscape due to recent municipal elections, it is unknown how alcohol-related harm will be prioritized relative to other community issues. The Integrated Municipal Enforcement Team (IMET) is a group of enforcement agencies, policy makers, politicians and front-line service providers who collaborate to identify and address community issues related to drugs and alcohol. Their meetings were identified as a good venue to share the findings of this rapid review. Discussion ensued about how councillors representing various wards within Brampton and Mississauga are members of IMET and would find the rapid review useful in addressing alcohol-related issues in their ward. The group identified that the various interventions presented in the rapid review allows for choice in implementation. Communities can determine which intervention would work best to decrease alcohol-related harm identified either through Peel's Alcohol Health Status report or from key stakeholders working/involved in that community.

Social Acceptability

Participants agreed that the general public will likely find the interventions socially and ethically acceptable. The following concerns were raised regarding the acceptability of the interventions by police and licensed establishment staff. The group discussed that due to budget constraints and the importance of being fiscally responsibility, allocation of police resources, specifically, adding more plainclothes officers, may not be deemed a good use of police services. The group also wondered if these interventions would be

acceptable to owners and managers of licensed establishments. Owners and managers may be motivated to implement these interventions voluntarily, if they were deemed to be good for business. Fights and brawls may not be good for a licensed establishment's business. It was noted that interventions restricting alcohol consumption in licensed establishments could be a potential issue among men aged 50 years and older, given that Peel's drinking rates are high among this age group. This age group tends to have the disposable income to spend in licensed establishments; servers may be reluctant to support responsible beverage server practices, particularly refusal of service, given their reliance on tips to supplement their hourly wages.

Available Essential Resources (personal and financial)

Participants agreed that we couldn't put a price on the value of saving a life. The interventions proposed would be cost-effective in terms of reducing health care and business costs (i.e. lowered emergency department visits, incidents of violence, vandalism and injury). The group came to a consensus that a multisectoral and collaborative approach is required whereby resources and information are shared to maximize resource availability and minimize cost. It was suggested that exploring a potential partnership with the Environmental Health Division is a viable option. Furthermore, it was suggested that Environmental Health could inform the SM/IP team when applications for a liquor license are received in their division. Environmental Health receives these applications to confirm the establishment's compliance with the Food Safety Act. This is a requirement of the AGCO in approving their liquor license. It was suggested that the partnership would allow the SM/IP team the opportunity to consult with the owners and managers of the establishments and share information and tools on how to reduce and prevent alcohol-related harm.

The group discussed exploring additional opportunities to partner with the AGCO in providing training and education to licensed establishments around preventing alcohol-related harms. The group discussed the importance of considering the police budget when proposing interventions that will require additional plainclothes officers. Further discussion highlighted that some interventions would not require additional costs because they are already mandated such as server training, AGCO random inspections, and the “last drink” program which is where Peel Regional Police established a database of all licensed premises within the Region in which people had been drinking prior to their arrest for impaired driving. The group concluded that the effectiveness of these already established programs would need to be considered.

Organizational Expertise and Capacity

The group agreed that the recommendations of the rapid review were in line with Peel Public Health’s 10 year strategic plan. Group members also pointed out that the interventions fit under the mandate of the Ontario Public Health Standards. There was agreement that the interventions could be supported by cross-departmental/divisional collaboration. However, some group members pointed out that multisectoral collaborations will be challenging given the different mandates, goals and target groups of each organization. The group further discussed that Public Health needs to understand what their role is relative to the partners and stakeholders. The importance of thinking about the yield of each intervention was highlighted. Interventions affecting the local licensing laws and that at the policy level will yield the highest.

Transferability

The need for more local data on alcohol-related harms specifically occurring in and around licensed establishments was noted. This would be beneficial in determining which interventions to pursue. Additional consideration of the ethnic and socio-demographic variables in Peel is needed. More specifically, we need to better understand drinking behaviour among Peel's immigrant population which makes up 51% of the population. It was noted that an "organic" synergistic approach to implementing the interventions may be more strongly supported in preventing alcohol-related harm in and around licensed establishments. The group suggested that the SM/IP team explore a partnership with the Tobacco Prevention team who are communicating with owners and operators of licensed establishments around recent change in legislation to the Smoke Free Act. This may be an opportunity to incorporate alcohol-related harm prevention messaging.

12 Recommendations

- Support community mobilization through collaborative partnerships with owners and managers of licensed establishments, police, licensing and enforcement services, and community partners to decrease alcohol-related harm in licensed establishments.

- Map out the mandates and roles of public health, police, and the AGCO and collaborate with these partners in working with licensed establishments to prevent and reduce alcohol-related harm.

- Continue to support mandatory server training for those working in licensed establishments.

- Explore whether current policing enforcement efforts are sufficient in preventing alcohol-related harm in the current context. Advocate for additional plainclothes officers from enforcement agencies entering bars and restaurants to cite servers and owners providing alcohol to intoxicated patrons as need indicates.

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Appendices

Appendix A: Concept Model

Appendix B: Search Strategy

Appendix C: Literature Search Flowchart

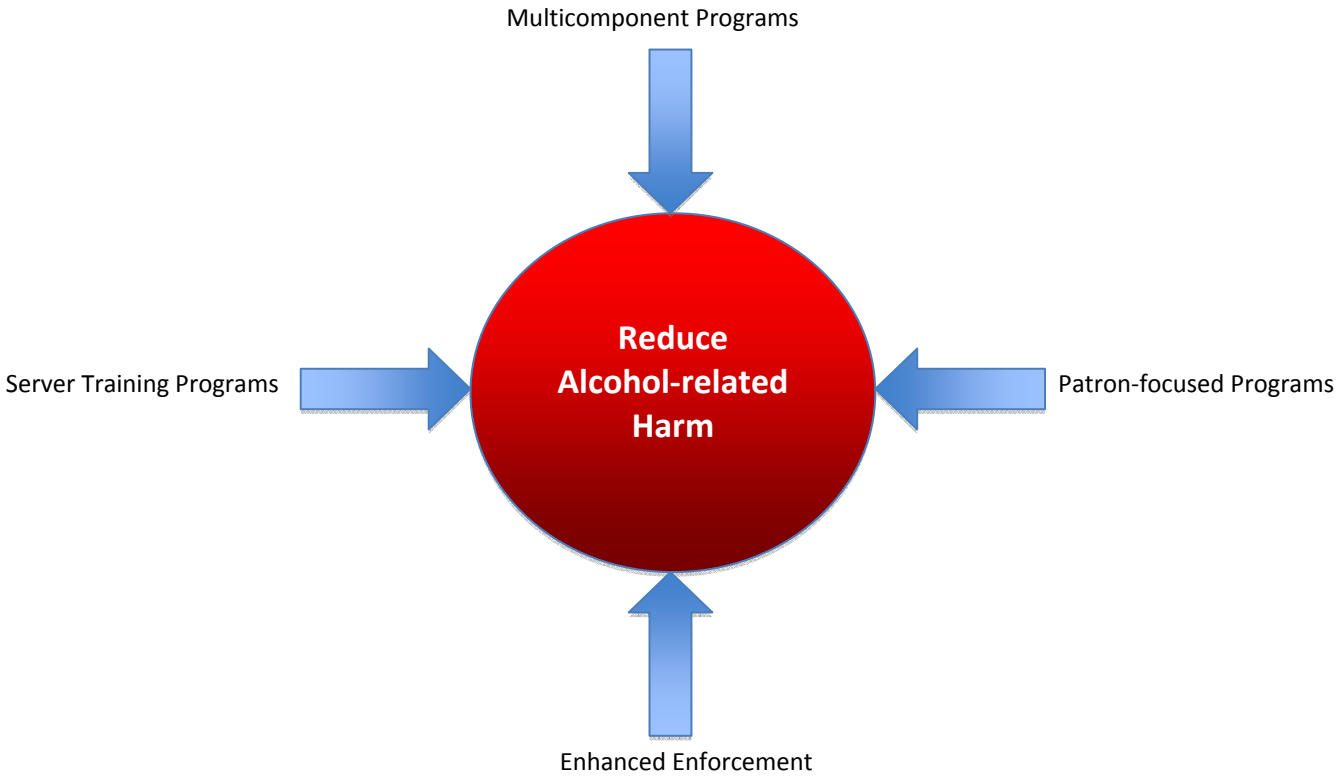
Appendix D: Data Extraction Tables

Appendix E: Synthesis Table

Appendix F: Applicability & Transferability Worksheet

Appendix A: Concept Model

Interventions to Reduce Alcohol-related Harm in Licensed Establishments



Appendix B: Search Strategy

PICO Question

Population	**Individuals who drink in licensed establishments**
Intervention	**Interventions in and around licensed establishments** *(**Note: "in and around" can include the physical property of the exterior of the licensed premise and/or harm resulting to a consumer or third party of the alcohol consumer, off the property of the licensed establishment.)*
Comparison	None
Outcome(s) of interest	**Reduce alcohol-related harm, some of which include:** Aggression Assault (including sexual assault) Binge drinking Injury Violence (including road crashes) Underage drinking
Research question in plain language:	**What are the most effective interventions to reduce alcohol-related harm among individuals who drink in and around licensed establishments?**

Search terms/ MeSH Headings

	Population	Intervention or Exposure	Comparisons	Outcomes
Terms	Young adolescents/adults 19+ Drinkers	Any related to alcohol-related harm in and around licensed premises	No Comparison	Aggression Assault (including sexual assault) Binge drinking Injury Violence (including road crashes) Underage drinking
MeSH headings	Underage Drinkers High-risk drinkers Binge drinkers Servers	Policy Education Advocacy Training		Over-intoxication Drinking Driving Alcohol-related Violence Alcohol-related Injury Binge Drinking Alcohol-related Aggression Alcohol Related crime

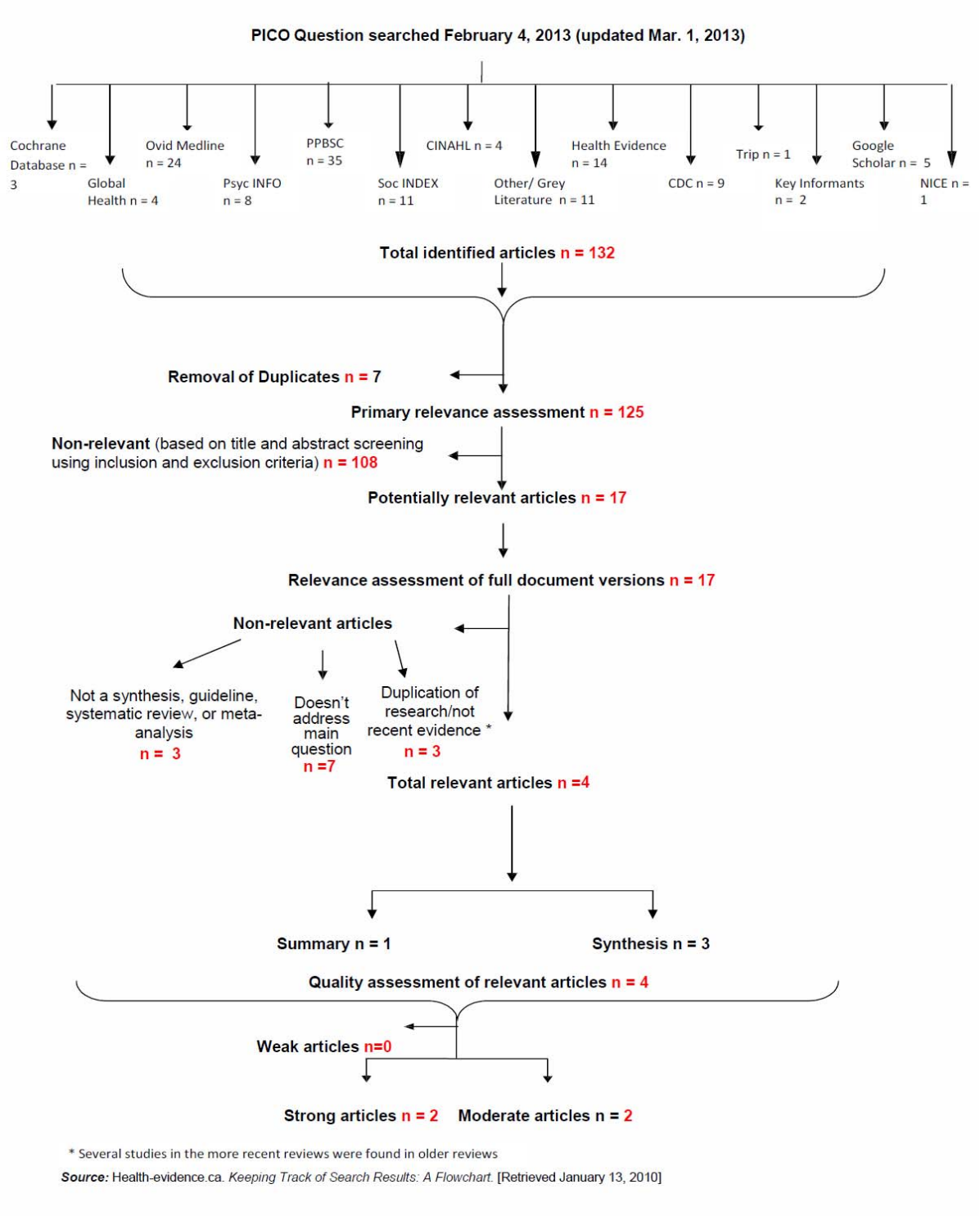
Search findings

Database/source	Date	Terms/Limits	# of findings
Known sources – summaries and grey literature (e.g TRIP, Guidelines, CDC, WHO, etc.)	January 26, 2013	'Alcohol drinking' AND 'Licensed Premises' OR Licensed Establishments' OR 'Bar" OR 'Club' OR 'Intoxicated' OR 'Alcohol-related Harm'; dates 2000 – 2013	22
Health Evidence	January 28, 2013	Alcohol-Related Harm in Licensed Establishments	0
		Alcohol-related harm	9
		Alcohol-related injury	2
EBM Reviews - Cochrane Database of Systematic Reviews <2005 to December 2012>, Global Health <1973 to December 2012>, Ovid MEDLINE(R) <1946 to January Week 4 2013>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <February 04, 2013>, PsycINFO <1987 to January Week 5 2013>	February 4th	1 exp Alcohol Drinking/ (46921) 2 exp Alcoholic Beverages/ (27061) 3 exp Alcoholic Intoxication/ (10479) 4 underage drink*.ti,ab. (562) 5 high-risk drink*.ti,ab. (666) 6 binge drink*.ti,ab. (5027) 7 (alcohol$ or beer$ or wine$ or liquor$ or spirit$ or drink$ or drunk$ or intoxicat$).ti,ab. (520003) 8 1 or 2 or 3 or 4 or 5 or 6 or 7 (532172) 9 (serve$ or serving or pub or pubs or bar or bars or nightclub$ or restaurant$ or licens$ or licenc$).ti,ab. (436109)	39

		10 (licens$ or licenc$ or brewer$).ti,ab. (37366) 11 (industr$ adj2 (alcohol or beer or brewery or liquor or wine)).ti,ab. (1026) 12 (winery or wineries or winebar$ or brewpub$).ti,ab. (615) 13 9 or 10 or 11 or 12 (440358) 14 exp "Wounds and Injuries"/ (650367) 15 exp Accidents/ (143350) 16 exp Crime/ (166651) 17 exp Rape/ (9351) 18 exp Homicide/ (25384) 19 exp automobile driving/ (13015) 20 exp Violence/ (117599) 21 (injur$ or death$ or mortalit$ or fatali$ or trauma$ or fall or falls or falling or burn$ or abus$ of violen$).ti,ab. (1852060) 22 (fractur$ or ruptu$ or wound$ or crash$ or accident$ or crim$ or offens$ or assault$).ti,ab. (559819) 23 (murder$ or homicid$ or attack$ or stab or stabbed or stabbing$ or danger$	

		or convict$ or arrest$).ti,ab. (320858) 24 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 (2908352) 25 meta-analysis.mp,pt. (87149) 26 systematic review.tw. (53227) 27 cochrane database of systematic reviews.jn. (16547) 28 25 or 26 or 27 (125083) 29 exp guideline/ (38587) 30 (practice guideline or guideline).pt. (23165) 31 29 or 30 (38587) 32 28 or 31 (162918) 33 (comment or letter or editorial or note or erratum or short survey or news or newspaper article or patient education handout or case report or historical article).pt. (1641642) 34 32 not 33 (157132) 35 8 and 13 and 24 and 34 (51) 36 remove duplicates from 35 (39)	
Key Informants	March 1. 2013		1
Google Scholar	February 4, 2013	Alcohol related harm AND Licensed Establishments	214,000

Appendix C: Literature Search Flowchart



Appendix D: Data Extraction Tables

Appendix D: Table 1	**OSBN Rapid Review – Data extraction Table** Reducing harm in drinking environments: A systematic review of effective approaches	
General Information and Quality Rating for Review		
Review Title	Reducing harm in drinking environments: A systematic review of effective approaches	
Authors	Jones, L, Hughes, K., Atkinson, A.M., & Bellis, M.A	
Name, Year, and Country of Publication	Health & Place, 2011, UK (Revised Edition)	
Quality Rating of Review	9/10 (Strong). Appraised using the Health-Evidence Quantitative Review Appraisal Tool. Review authors did not indicate whether studies were assessed independently	
Objective of Review	To examine the effects of interventions implemented in drinking environments on a broad range of harm, including alcohol consumption, underage alcohol sales, violence and road traffic crashes	
Summary of results	The findings of this review show that the effective delivery of multicomponent programs (combining community mobilization, responsible beverage service training, house policies, and stricter enforcement of licensing laws) are effective at decreasing alcohol related harm. One high-quality study indicates that mandating server training reduces single vehicle night-time crashes. A limited number of studies indicate trained servers intervened with a low level of frequency in patrons drinking. Lastly, the review authors indicate that the low methodological quality limits the overall findings of the review.	
Details of Review		
Search Strategy	Electronic Databases searched: 10 databases were searched: Medline, PsychINFO, ETOH, Web of Science, ASSIA, ERIC, Project Cork, Cochrane Library, Alcohol Studies Databases Search period: 1990 – 2008 Additional methods: Database searches were supplemented by searching websites related to alcohol research, and by checking the reference lists of retrieved articles, relevant reviews and book chapters (no additional studies were identified through these sources)	
Inclusion and Exclusion	Inclusion Criteria	Exclusion Criteria
	Interventions: had to be delivered in drinking environments	**Study design:**

Abbreviations: RBS: Responsible beverage service; SVN: single vehicle night time; EMS: Emergency medical services; On-premises: alcohol served in a licensed establishments; Off-Premise: Alcohol served/sold in a non-licensed area or retail location; ED: Emergency department; BAC: Blood Alcohol Concentration

Criteria	**Outcomes of studies** had to have a focus of reducing the (acute) harm associated with alcohol consumption (violence, injuries, assaults aggression, anti-social behaviour, crime, road traffic crashes and pedestrian injuries, health service utilization, and excessive alcohol consumption) **Setting:** individuals in drinking environments **Population:** patrons, workers, owners and managers, licensed alcohol serving outlets or areas of multiple licensed alcohol serving outlets	▪ editorials ▪ non-systematic overviews ▪ comments ▪ letters ▪ conference abstracts **Interventions:** targeting the sale and supply of alcohol to underage drinkers via the off trade ('on trade' means pubs, clubs, bars restaurants, etc the 'off trade is off licenses, corner shops, retailers, and wholesalers) only or measures regulating the physical availability of alcohol (i.e. limiting days and hours of sale were excluded)
Number, Type, and Location of Included Primary Studies	39 studies. 11/39 evaluated the same programs. They were grouped with their original study and treated as one study - 7 Randomized Controlled Trials (RCTs), 7 Non Randomized Clinical Controlled Trials (CCTs), 5 Interrupted Time Series (ITS), 3 Cohort Analytical Studies (CAS), 6 Uncontrolled Before and After (UBA) studies - USA [23], Australia [9], other countries including Sweden [2], the UK [3] and Canada [2]	
Quality of Included Primary Studies	- Quality of included studies was assessed using the Effective Public Health Practice Project (EPHPP) Quality Assessment Tool. Studies using Interrupted time series (ITS) design were assessed with the Cochrane Effective Practice and Organization of Care Group tool - 3 scored strongly (all ITS designs), - 9 scored moderately (3 CCT, 4RCT, 2 ITS) - 16 scored weak (6 UBA, 3RCT, 3 CAS, 4 CCT)	
Data Analysis	Review authors provided a narrative synthesis due to the variety of interventions and outcomes measured in the studies used in the review	
Details of Interventions and results of the review		
Training interventions on server outcomes (5 studies)		
1. Three studies examined the impact of server training on the outcome of server intervention. One showed no effect (Lang et al., 1998), two showed an increase in server intervention, although the frequency of server intervention was low (Gliksman et al., 1993; McKnight, 1991). 2. One study examined the impact of one on one training with owners and managers on the outcome of underage sales and sales to pseudo intoxicated patrons. There was no effect (Toomey et al., 2001). 3. One study examined the replacement of annealed glassware with toughened glassware on injuries among servers. There was an increase in server		

Abbreviations: RBS: Responsible beverage service; SVN: single vehicle night time; EMS: Emergency medical services; On-premises: alcohol served in a licensed establishments; Off-Premise: Alcohol served/sold in a non-licensed area or retail location; ED: Emergency department; BAC: Blood Alcohol Concentration

injuries with the toughened glassware (Warburton and Shepherd, 2000).

Training and Health Promotion interventions on patron outcomes (8 studies)

1. Two studies examined the impact of server training on the outcome of patron alcohol consumption. One showed a reduction in alcohol consumption in patrons with BAC ≥0.08mg% (Lang et al., 1998). One study showed no effect (Johnsson & Berglund, 2003).
2. One study examined the impact of alcohol brief intervention, personalized risk assessment and BAC testing on alcohol consumption. The study found a pre-to-post reduction in consumption by those who initially had harmful or hazardous levels of alcohol consumption (VanBeurden, 2000).
3. One study examined a state wide mandatory server training program on the outcome of single vehicle night time crashes, noting an estimated decrease of 23% in single vehicle night time crashes by the end of the third year following the implementation of the program (Holder and Wagenaar, 1994).
4. One study examined training and risk management on the outcome of aggression in bars. There was a modest decrease in severe and moderate patron aggression (Graham et al., 2004).
5. Two studies each examined one of the following interventions, a designated driving program, and a responsible drinking promotion program for patrons on the outcome of drunk driving. There was no effect (Boots and Midford, 1999; McLean et al., 1994). A third study examined the impact of a program where patrons were driven between bars on the outcome of drunk driving. This study showed no effect on the number of drinks consumed and a reduction in the frequency of impaired driving over a two week period (Rothschild et al., 2006).

Policing and enforcement approaches on server outcomes (2 studies)

1. One study examined a program of combined training and police enforcement checks on underage drinking. There was a short term decrease in sales to underage drinkers (Wagenaar et al., 2005).
2. One study examined the impact of police enforcement checks on sales to intoxicated patrons, finding a short term increase on sale refusals (McKnight & Streff, 1994).

Policing and enforcement approaches on patron outcomes (5 studies)

Abbreviations: RBS: Responsible beverage service; SVN: single vehicle night time; EMS: Emergency medical services; On-premises: alcohol served in a licensed establishments; Off-Premise: Alcohol served/sold in a non-licensed area or retail location; ED: Emergency department; BAC: Blood Alcohol Concentration

1. One study examined the impact of a drink driving enforcement program and media intervention on alcohol related crashes. There was a significant reduction of 45% in the number of alcohol-related crashes among 16-20 year olds; but not among 21-25 year olds (Voas et al., 2005).

2. Two studies examined the impact of police enforcement interventions on the number of recorded assaults. In one study, there were increases in the number of assaults recorded; however no difference in the overall number of assaults (Burns et al., 1995). A second study reported an increase in alcohol-related disorder (49%) and a decrease in alcohol-related assaults (4%) in the first 12 months (significance is not reported) (Maguire & Nettleton, 2003).

3. Three studies examined the impact of targeted police intervention in high-risk premises compared to 'low level' policing on alcohol-related incidents. The targeted police intervention in high-risk premises was more effective in decreasing alcohol related incidents compared to 'low level' policing (Wiggers et al., 2004; Maguire and Nettleton, 2003; Warburton and Shepherd, 2006).

Multicomponent programs on all outcomes (19 studies)

1. Thirteen studies each evaluated one of three programs, the *Community Trials Project, STAD Project, and the Communities Mobilizing for Change on Alcohol*. These programs combined community mobilization, responsible beverage service training, house policies and stricter enforcement of licensing laws indicated a positive effect in reducing assaults, and traffic crashes.

2. Nine studies (Holder et al., 2000; Grube, 1997; Holder et al., 2000; Holder and Reynolds, 1997; Holder et al., 1997a; Holder et al., 1997b; Roeper et al., 2000; Saltz and Stanghetta, 1997; Treno and Holder, 1997) evaluated the *Community Trials Project* with interventions that included community mobilization, responsible beverage service training, controls on outlet density and components designed to address drink driving, and underage drinking found reductions in the quantities of alcohol consumed -6%(95%CI-12%,-1%), single vehicle night time crashes and alcohol-related crashes -10% (95%CI-14%,-4%) and -6%(95%CI-8%,-3%) respectively and hospitalized assault injuries -2%(95%CI-3%,-1%). The program had no effect on hospital assault cases.

3. Three studies evaluated the 10 year long STAD project that included the interventions of community mobilization (authorities and the hospitality industry working together), responsible beverage service training and stricter enforcement of existing alcohol laws on violent crime and service refusal rates. There was a reduction in violent crimes by 29% (assaults, illegal threats and harassment, violence and threats targeted at door staff/police) in the intervention area. Within premises that had RBS training there was a higher rate of service refusal over long-term follow-up from 47% to 70% (Wallin et

Abbreviations: RBS: Responsible beverage service; SVN: single vehicle night time; EMS: Emergency medical services; On-premises: alcohol served in a licensed establishments; Off-Premise: Alcohol served/sold in a non-licensed area or retail location; ED: Emergency department; BAC: Blood Alcohol Concentration

al., 2002, 2003, 2005).

4. One study conducted a cost effectiveness analysis of the STAD project and estimated a cost savings ratio of 1:39 (Mansdotter et al., 2007).

5. Three studies (Wagenaar et al., 1999; Wagenaar et al., 2000a, 2000b) of the *Communities Mobilizing for Change on Alcohol program* examined the impact of community mobilization on the outcomes of underage access to alcohol, sales from on-and off-licence premises, age identification checking, alcohol consumption, drink driving arrests and single vehicle night time crashes. There was no difference between intervention and control communities on the outcomes of underage access to alcohol, sales from on-and off-licence premises, age identification checking, alcohol consumption among 17 – 18 and 18 – 20 year olds and drink driving arrests among 15 – 17 year olds. There was a reduction in drink driving arrests among 18-20 years and no effect in single vehicle night time crashes among this age group.

6. One study (Treno et al., 2007) evaluated one program that combined community mobilization, community awareness, and responsible beverage service training and law enforcement in relation to underage access to alcohol and intoxicated patrons. The program reduced assaults and motor vehicle accidents based on police and emergency medical service reports. There was no effect on sales to underage and pseudo-intoxicated patrons among the same age group.

7. Two studies (Weitzman et al., 2004 and Nelson et al., 2005) examined a campus community coalition initiative focusing on reducing college binge drinking. There were declines in alcohol consumption, alcohol-related harm and drink driving observed after follow-up, based on self-reported outcomes at the five sites with the highest implementation of environmental programming.

8. Two studies (Homel et al., 1997 and Hauritz et al., 1998) evaluated two separate programs that implemented community steering committees and forums, task groups to address the safety of public spaces, venue management, and security and policing. There were reductions in incidents of aggression and violence around licensed premises (significance is unreported).

Comments and Limitations

Review Author's Comments

- Due to contextual factors that differ in each community the generalizability of implementing interventions that were reported becomes questionable.

Abbreviations: RBS: Responsible beverage service; SVN: single vehicle night time; EMS: Emergency medical services; On-premises: alcohol served in a licensed establishments; Off-Premise: Alcohol served/sold in a non-licensed area or retail location; ED: Emergency department; BAC: Blood Alcohol Concentration

Comments separate from the review authors.
- Authors of the review did not provide confidence intervals to help determine effect sizes consistently throughout the review

Abbreviations: RBS: Responsible beverage service; SVN: single vehicle night time; EMS: Emergency medical services; On-premises: alcohol served in a licensed establishments; Off-Premise: Alcohol served/sold in a non-licensed area or retail location; ED: Emergency department; BAC: Blood Alcohol Concentration

Appendix D: Table 2	Interventions in the alcohol server setting for preventing injuries (Review)	
General Information and Quality Rating for Review		
Review Title	Interventions in the alcohol server setting for preventing injuries	
Authors	Ker, K. and Chinnock, P.	
Name, Year, and Country of Publication	The Cochrane Library, 2010 (Issue 8), UK	
Quality Rating of Review	9/10 (Strong) - Appraised using the Health-Evidence Quality Assessment tool. Review authors did not indicate whether studies were assessed independently.	
Objective of Review	To quantify the effectiveness of interventions in the alcohol server setting for reducing injuries.	
Summary of Results	The review found insufficient evidence that interventions in the alcohol server setting effectively prevent injuries. Server and patron compliance with interventions is an issue; one study indicated mandated interventions may be more likely to show an effect.	
Details of Review		
Search Strategy	Electronic databases searched: 14 [Cochrane Injuries Group's Specialized Register, Cochrane Register of Controlled Trials, Conference Proceedings Citation Index – Science, EMBASE, ETOH, ISI Web of Science, MEDLINE, National Research Register, PsycINFO, PsycEXTRA, SIGLE, SPECTR, TRANSPORT, Zetoc] Search period: 1806-2008 Additional methods: Searched the Internet, reference lists of relevant articles, and contacted the first author of included studies. Searches were not restricted by date, language, or publication status.	
Inclusion and Exclusion Criteria	Inclusion Criteria	Exclusion Criteria
	Study design: ▪ Randomised controlled trial (RCT) ▪ Non-randomised controlled trial (NRT) ▪ Controlled before-and-after trial (CBA) **Interventions:** ▪ Modify alcohol serving and consumption conditions ▪ Facilitate sensible alcohol consumption ▪ Reduce occurrence of alcohol-related harm **Study participants and settings:** ▪ Workers in licensed alcohol serving premises (e.g., bar staff) ▪ Owners and managers of licensed premises	**Interventions:** ▪ Server liability ▪ Days and hours of sale ▪ Advertising restrictions

	▪ Patrons in licensed premises ▪ Licensed outlets (e.g. bars, restaurants) ▪ Areas of multiple licensed outlets (e.g., cities) **Outcomes of Studies:** ▪ Injuries, behaviour change, and/or knowledge change	
Number, Type, and Location of Included Primary Studies	23 (of which two studies data was not extracted) - 8 RCTs, 10 NRTs, 5 CBAs (published from 1987 to 2008) - 2 studies not extracted: (Haworth, 1997 and Peltzer, 2006) - Studies were located in the following countries: Australia [5], Canada [2], Sweden [2], UK [1], and USA [12], South Africa [1]	
Quality of Included Primary Studies	- Assessed with Risk of Bias tool from 2008 Cochrane Handbook for Systematic Review of Interventions - Overall, included studies had low methodological quality and risk of bias due to: ▪ Poor randomization and allocation concealment ▪ Varied levels of intervention compliance ▪ Short periods of data collection and follow-up ▪ Low response rates from questionnaires and interviews ▪ Lack of details of participant withdrawals and drop-outs ▪ Lack of adjusted statistical calculations (e.g., regression-to-the-mean for cluster RCTs)	
Data Analysis	- A meta-analysis was not conducted due to large heterogeneity across interventions, therefore studies were reviewed narratively	

Details of Interventions and results of the review

Server training interventions on reducing injury (1 study)

1. One study investigated the impact of mandated server training on the outcome of single vehicle night time crashes. The intervention led to a decrease of 4% after six months, 11% after 12 months, 18% after 24 months, reaching 23% after 36 months (Holder, 1994)

Server training interventions on patron behaviour (5 studies)

1. Four studies measured server training on the outcome of patron alcohol consumption. One study showed a positive effect, for the change in percent of patrons with a BAC > 0.08%mg with a decline of -25.1% in the experimental bars where servers were trained compared to a decline of -10.8% in the control bars (P<0.029). However, this study found no effect in the change of percent of patrons with a BAC>0.15mg% (Lang, 1998). Two studies showed no effect of server training in reducing patron BAC (Johnsson, 2003; Krass, 1994). One study using self-reported data found no effect on overall alcohol consumption or the rate of alcohol consumption however they did report a positive intervention effect on the risk of having a BAC > 0.1mg% (P<0.05) (Saltz, 1987).

2. One study measured the effect of a server training program on reducing observed aggression exhibited by patrons and staff. A effect was found for severe physical

aggression exhibited by patrons; with average number of incidents decreasing by 0.018 in the experimental group and increasing by 0.053 in the control (P<0.001). No effect was found when examining all severe aggression plus moderate physical aggression by patrons (Graham, 2004).

Server training interventions on server behaviour (11 studies)

1. Six studies measured the effect of server training on the outcome of server behaviour measured by observation scores. One study found that trained servers had higher frequency of observed responsible service interventions of compared to servers who did not have the training (P < 0.05) (Russ, 1987). One study found an increase in mean scores of 0.19 to 0.34 for servers at the experimental sites compared to the control sites who maintained the same score of 0.22 pre to post intervention (P=0.01). This same study reported an increase in self-reported server behaviour from 3.13 to 3.50 pre to post training (p<0.01) (McKnight, 1991). The third study observed servers throughout six scenarios and found an increase in intervention mean scores among servers in the experimental sites of 15 to 21.5 compared to the controls 16.5 to 16.4, pre to post intervention (P<0.01) (Gliksman, 1993). The remaining three studies found no effect on observed scores of server behaviour (Peltzer, 2006; Saltz, 1997; Howard-Pitney, 1991).

2. One study measured a six hour server training program and found that the average exit BAC for pseudo patrons served by servers who were untrained was 0.103mg% (+/- 0.033); while those served by trained personnel had an average BAC of 0.059mg% (+/-0.019). The mean difference in exit BACs between pseudopatrons served by trained versus untrained servers was 0.044mg% (95% CI 0.022 to 0.066) (Russ, 1987).

3. Five studies that measured the effect of server training on the outcome of servers intervening with intoxicated and pseudo-intoxicated patrons. One study examined observed server behaviour to 'real' intoxicated patrons and found a significant increase in intervention level by trained servers in the experimental sites from 0.03 to 0.22 (P=0.04) and no effect in the control sites which remained unchanged at 0.07 (P=0.35), pre to post intervention period (McKnight, 1991) The remaining five studies found no effect (Lang 1998; Toomey 2001; Toomey 2008; Wallin, 2002; Howard-Pitney, 1991). One of these studies also measured successful attempts to purchase alcohol by pseudo-intoxicated patrons. No effect was found (Toomey, 2001).

4. Three studies evaluated server training on the outcome of self-reported server behaviour. No difference was found between experimental and control groups (Buka, 1999; Lang 1998; Saltz, 1997).

Server training interventions on server knowledge (5 studies)

1. Five studies measured server training on the outcome of server knowledge. Four of the five studies found an increase in server knowledge, post training (P<0.05). Gliksman reported results for the true/false section increase significantly pre to post test t= -12.5, P<0.001 and results from open ended question section increase pre to post test, mean score increased from 1.3 to 5.29, t=-1-.89, P,0.001. Krass reported that the mean total knowledge score increased from 23.98 to 30.8, t=-12.03, df = 66, P<0.001. (Gliksman, 1993; Krass, 1994; Howard-Pitney, 1991; Lang, 1998). The fifth study had no data available (Peltzer, 2006).

Health promotion initiatives on patron behaviour (3 studies)
1. One study evaluated the distribution and display of sensible drinking information in bars on the outcome of alcohol consumption of patrons and the intent of patrons to drive after being tested with a BAC >0.05%mg. Self-reported alcohol consumption was less in the experimental group (38g) versus the control (47g) (P=0.01) (McLean, 1994). No effect was found between the control and experimental bars on the BAC measures or with the intent of patrons to drive after being tested with a BAC >0.05%mg. 2. One study evaluated whether the distribution of cards containing 'safe-partying' tips through liquor stores had an effect on the behaviour of drinkers. No effect was found in the number of drinkers adhering to the safe-partying tips. No effect was found for community-wide change in safe partying knowledge (Boots, 1995). 3. One study evaluated the promotion activities by the rates of use of public breathalyzers. The published data was not usable (Haworth, 1997).
Drink driving service on reducing injury (1 study)
1. One study evaluated the effectiveness of a free driving home service for intoxicated drinkers on the outcome of injury crashes. A reduction of injury crashes by 15% was found after implementation of the program. However, no effect was found on the outcome of fatal crashes (Lacey, 2000).
Server setting interventions on reducing injury (2 studies)
1. One study measured the effect of the use of toughened glassware on the outcome of staff injury. Results indicated that the toughened glassware caused more injury than the control (annealed) glassware (Warburton, 2000). 2. One study evaluated environmental interventions to reduce crime experienced by the drinking establishment (mainly off-premise – i.e., stores selling alcohol) and used six injury measures as outcomes. There were positive effects on the outcomes of 'all-crime' and 'police reports' with rate ratios of 4.6 (95%CI 1.7to12) (P=0.01) and 2.7 (95%CI 1.3 to 5.4) (P=0.01) respectively. There was no effect on the outcomes of robbery, assault, shoplifting, and injury (Casteel, 2004).
Server setting policy intervention on reducing injury (1 study)
1. One study evaluated a policy aimed at minimizing the movement of drinkers between different bars and their alcohol consumption on the outcome of serious assaults. No effect was reported (Felson, 1997).

Comments/Limitations	Comments from authors: • Many included studies conducted pre-2000, thus relevance and generalizability to present day is questionable.

	• Interventions like server training, where responsibility of sensible alcohol consumption is placed upon servers, may be a limited effective strategy. If control lies within the alcohol industry, interventions may be difficult to implement especially if profits may be compromised (unless it is legislated or has incentives/rewards). • In comparison to Schultz' 2001 review, which concluded 'sufficient evidence' for server training to effectively reduce patrons' intoxication levels, this review indicates that there is a lack of solid evidence. Therefore, 'sufficient evidence' for effectiveness of server training in reducing alcohol intoxication may be considered tentative. <u>Limitations of review from authors:</u> • For some studies, only select outcome measures were reported which were deemed meaningful (these were post-hoc decisions, thus a potential weakness of review). • Included studies' results are limited by weak methodological quality, thus it is prone to bias and an over-estimate of effect. • Researchers' focus should be expanded to study the effectiveness of interventions other than server training.

Appendix E: Synthesis Table

Synthesis Table of studies showing the effectiveness of interventions in licensed establishments to reduce alcohol related harm

Outcome ↓	Intervention Type							
	Server Training (n = 16 studies)		Police and Enforcement (n= 7 studies)		Multicomponent (n=19 studies evaluating seven programs)		Health Promotion (n=7 studies)	
	Population & Intervention	Outcome	Population & Intervention	Outcome	Population & Intervention	Outcome	Population & Intervention	Outcome
Server/Patron Knowledge	Servers in a 1-2hr training (Lang, 1998; **M**)	↑ server knowledge of serving laws	N/R		N/R		Promoting responsible serving at house parties (Boots, 1995: **W**)	↔ community-wide change in safe-partying knowledge resulting from the campaign
	Servers/managers completing 4.5 hr training (part of new/revised house policy) (Gliksman et al, 1993; **M**)	↑ server knowledge						
	4hr training package (Krass, 1994; **W**)	↑ mean total knowledge score						
	One-day training session (Howard-Pitney, 1991; **W**)	↑ servers and managers knowledge						
Total	Sig. Effect: 4/4 No Effect: 0/4		Sig. Effect: 0/0 No Effect: 0/0		Sig. Effect: 0/0 No Effect: 0/0		Sig. Effect: 0/1 No Effect: 1/1	
Change in Server Practice	Servers/managers completing 4.5 hr training (part of new/revised house policy) (Gliksman et al, 1993; **M**)	↑ server behaviour scores based on observation of 6 scenarios	N/R		N/R		Promoting responsible serving at house parties (Boots, 1995: **W**)	↔ refusing service, provision of transport, non-alcoholic drinks, and providing food (self-reported by patrons)
	Servers/Managers completing a 6 hr training (3hrs servers/managers; 3 hrs managers only) (McKnight, 1991; **M**)	↑ in mean scores (experimental sites) of server intervention;						

Outcome ↓	Intervention Type							
	Server Training (n = 16 studies)		Police and Enforcement (n= 7 studies)		Multicomponent (n=19 studies evaluating seven programs)		Health Promotion (n=7 studies)	
	Population & Intervention	Outcome	Population & Intervention	Outcome	Population & Intervention	Outcome	Population & Intervention	Outcome
Change in Server Practice	Servers in a 1-2hr training (Lang, 1998; **M**)	↔ adoption of server practices						
	Multicomponent program (server training component evaluated) (Saltz, 1997; **W**)	↔ observed and self-reported server behaviour						
	24 - Server training courses (5 hours each) (Buka, 1999; **W)**	↔ self-reported server behaviour						
	6 hour training ("TIPS" training) (Russ, 1987; **W**)	↑ frequency of server intervention						
	5-6 hour training provided free (Peltzer, 2006)	↔ observed server scores on server behaviour						
Total	Sig. Effect: 3/7 No Effect: 4/7		Sig. Effect: 0/0 No Effect: 0/0		Sig. Effect: 0/0 No Effect: 0/0		Sig. Effect: 0/1 No Effect: 1/1	
Sales to underage	One-on-one consultations for owners/managers (Toomey, 2001; **W**)	↔ underage sales	Server/management training and police enforcement checks (Wagenaar et al., 2005; **S**)	↓ sales (short term) impact of enforcement checks on and off premise	Community mobilization, RBS training, law enforcement (Treno, 2007; **W**)	↔ sales to underage	N/R	
					Community mobilization to reduce youth access to alcohol (Wagenaar, 1999, 2000a, 2000b; **M)**	↔ sales to underage		
Total	Sig. Effect: 0/1 No Effect: 1/1		Sig. Effect: 1/1 No Effect: 0/1		Sig. Effect: 0/2 No Effect: 2/2		Sig. Effect: 0/0 No Effect: 0/0	

Outcome ⇣	Intervention Type							
	Server Training (n = 16 studies)		Police and Enforcement (n= 7 studies)		Multicomponent (n=19 studies evaluating seven programs)		Health Promotion (n=7 studies)	
	Population & Intervention	Outcome	Population & Intervention	Outcome	Population & Intervention	Outcome	Population & Intervention	Outcome
Refusal of sales to intoxicated patrons	Multicomponent program (server training component) (Wallin, 2002; **S)**	↔ refusal rates	↑ Plainclothes officers from enforcement agencies entered bars and restaurants periodically to cite servers found serving alcohol to intoxicated patrons. (McKnight, 1994; **W**)	↑ refusal of service in the short term	Community mobilization, RBS training, enforcement of alcohol laws (Wallin, 2002, 2003, 2005; **S**)	↑ Rate of refusal (47% to 70%)	N/R	
	Servers in a 1-2hr training (Lang, 1998; **M**)	↔ servers refusing alcohol to pseudo-intoxicated patrons			Community mobilization, RBS training, law enforcement (Treno, 2007; **W)**	↔ on sales of alcohol		
	One-on-one consultations for owners/managers (Toomey, 2001; **W**)	↔ refusal of alcohol to pseudo-intoxicated patrons						
	One-day training session (Howard-Pitney, 1991; **W**)	↔ differences on mean number of interventions made by servers for eight different interventions						
	Servers/Managers completing a 6 hr training (3hrs servers and managers; 3 hrs managers only) McKnight, 1991; **M**)	↑ in intervention level to 'real intoxicated' patrons by trained servers						
	6 hour training ("TIPS" training) (Russ, 1987; **W**)	↑ refusal shown by a decrease in mean difference in exiting BAC (%mg) for pseudo-patrons [0.044(95%CI 0.022 to 0.066)]						

Outcome ⇣	Intervention Type							
	Server Training (n = 16 studies)		Police and Enforcement (n= 7 studies)		Multicomponent (n=19 studies evaluating seven programs)		Health Promotion (n=7 studies)	
	Population & Intervention	Outcome	Population & Intervention	Outcome	Population & Intervention	Outcome	Population & Intervention	Outcome
Refusal of sales to intoxicated patrons	1-2hr training for owners/managers (Toomey, 2008; **W**)	↔ successful purchase attempts by pseudo-drunk patrons						
Total	Sig. Effect: 2/7 No Effect: 5/7		Sig. Effect: 1/1 No Effect: 0/1		Sig. Effect: 1/2 No Effect: 1/2		Sig. Effect: 0/0 No Effect: 0/0	
Alcohol Consumption	Servers in a 1-2hr training (Lang, 1998; **M**)	↓ % of patrons with BAC > 0.08mg% (52% to 26%); ↔ Δ in % of patrons with BAC > 0**.15m**g%	N/R		Community mobilization, media advocacy, RBS training, enhanced enforcement efforts against drink-driving and underage drinking, local restrictions on access (Holder, 2000; Grube, 1997; Holder and Reynolds 1997; Holder et al. 1997a, 1997b; Roeper et al. 1999; Saltz and Stanghetta, 1997; Treno and Holder, 1997; **M**)	↓ Quantity of alcohol consumed -6% (95% CI-12%, -1%)	Patrons receiving responsible drinking promotions and option to use breathalyser (McLean et al., 1994; **W**)	↓ Self-reported alcohol consumption (38g vs. 47g); ↔ median alcohol consumption based on BAC. ↔ % of patrons with BAC > 0.10mg% **AND** 0.15mg%
	Servers receiving 5 lectures on responsible alcohol service (Johnsson & Berglund, 2003; M)	↔ Δ in mean patron BAC >0.1mg%					Patrons receiving free transportation between bars and clubs (Rothschild et al., 2006; **W**)	↔ # of drinks consumed
	4hr training package (Krass, 1994; **W**)	↔ mean BAC (mg%); ↔ total consumption; ↔ proportion of patrons' BAC > 0.10mg%,					Patrons receiving brief Intervention, risk assessment and BAC testing (Van Beurden, 2000; **W**)	↓ pre-to-post-self-reported test reductions in alcohol consumption by identified harmful/hazardous consumers
	Development of new and revised management policies regarding the service of alcohol and an 18-hour training course for all club	↓ risk of having a BAC>0.10% (estimated by number of drinks consumed); ↔ overall alcohol consumption or rate of consumption			Various environmental policies (RBS training, ban on advertising) (Weitzman, 2004;	↓ alcohol consumption		

Outcome ↓	Intervention Type							
	Server Training (n = 16 studies)		Police and Enforcement (n= 7 studies)		Multicomponent (n=19 studies evaluating seven programs)		Health Promotion (n=7 studies)	
	Population & Intervention	Outcome	Population & Intervention	Outcome	Population & Intervention	Outcome	Population & Intervention	Outcome
Alcohol Consumption	personnel (Saltz, 1987; **W)**				Nelson, 2005; **W**)			
					Community mobilization to reduce youth access to alcohol (Wagenaar, 1999, 2000a, 2000b; **M)**	↔ 18-20 year olds access to alcohol and alcohol use		
Total	Sig. Effect : 2/8 outcomes No Effect: 6/8 outcomes		Sig. Effect: 0/0 No Effect: 0/0		Sig. Effect: 2/3outcomes No Effect: 1/3outcomes		Sig. Effect: 2/4 outcomes No Effect: 2/4 outcomes	
Patron/staff Aggression	Servers/Security/ managers in 3hr risk management training (Graham, 2004; **M**)	↓ severe physical aggression -avg. number of incidents decreased by 0.018 (definite intent); ↔ all severe and moderate physical aggression (with/without verbal aggression; definite intent)	Increased police supervision to underage and intoxicated patrons (Burns, 1995; **M)**	↔ violence and criminal offences	Community mobilization, RBS training, enforcement of alcohol laws (Wallin, 2002, 2003, 2005; **S**)	↓ Violent crimes (29%)	Cover fees, increased enforcement of LE capacity and street laws (Felson, 1997; **M)** *(Significance not recorded)*	↔ serious assault rates
			Targeted police operation (Used ED data to monitor assault rates) (Warburton, 2006, **W)**	↓ assaults when targeting high-risk premises vs. routine policing;	Community mobilization, media advocacy, RBS training, enhanced enforcement efforts against drink driving and underage drinking, local restrictions on access (Holder, 2000; **M)**	↔ hospital assault cases (ER visits)		
		Observed aggression exhibited by staff: ↔ all severe and moderate physical	Police feedback to high-risk premises vs. normal polcing (Wiggers, 2004; **W)**	↔ alcohol-related incidents				

Outcome ↓	Intervention Type							
	Server Training (n = 16 studies)		Police and Enforcement (n= 7 studies)		Multicomponent (n=19 studies evaluating seven programs)		Health Promotion (n=7 studies)	
	Population & Intervention	Outcome	Population & Intervention	Outcome	Population & Intervention	Outcome	Population & Intervention	Outcome
Patron/Staff Aggression		aggression (with/without verbal aggression; definite intent)	Police-led multi-agency scheme to reduce the level of alcohol-related violence and disorder (Maguire, 2003; **W**) *(No significance recorded)*	↔ on assaults	Various environmental policies (RBS training, ban on advertising) (Weitzman, 2004; Nelson, 2005; **W**)	↓ second hand effects (i.e. insulted, assaulted, property damage, unwanted sexual violence, study or sleep disrupted)		
					Community mobilization, code of practice for nightclub managers, venue management (Hauritz, 1998; **W)**	↔ all forms of aggression and violence		
					Community mobilization, RBS training, law enforcement (Treno, 2007; **W**)	↓ assaults reported to police and EMS		
					Community mobilization, code of practice for nightclub managers, venue management (Homel, 1997, **W**)	↔ in physical assaults, verbal abuse and arguments		
Total	Sig. Effect: 1/3 outcomes No Effect: 2/3 outcomes		Sig. Effect: 1/5 No Effect:4/5		Sig. Effect: 3/6 No Effect: 3/6		Sig. Effect: 0/1 No Effect: 1/1	
Drinking and Driving	Servers in mandated training (Holder, 1994; **S**)	↓ SVN crashes by 11% in 12 months, 18% in 24 months; 23% after 36 months	Special patrols and sobriety checkpoints; increase in border foot patrols and enforcement of laws; media advocacy (Voas, 2002; **M**)	↓ alcohol-related crashes among 16 -20 years olds by 45%. ↔ on 21-30 year old	Community mobilization, media advocacy, RBS training, enhanced enforcement efforts against drink driving and underage drinking, local restrictions on access (Holder, 2000; **M)**	↓ SVN crashes and alcohol-related crashes -10% (95%CI -14%,-4%) and -6% (CI95%-8%,-3%) respectively.	Promoting responsible drinking (McLean, 1994; **W**)	↔ % of patrons with BAC > 0.05 with intent to drive

Outcome ↓	Intervention Type							
	Server Training (n = 16 studies)		Police and Enforcement (n= 7 studies)		Multicomponent (n=19 studies evaluating seven programs)		Health Promotion (n=7 studies)	
	Population & Intervention	Outcome	Population & Intervention	Outcome	Population & Intervention	Outcome	Population & Intervention	Outcome
			Plainclothes officers from enforcement agencies entered bars and restaurants periodically to cite servers found serving alcohol to intoxicated patrons. (McKnight, 1994; **W**)	↔ % of drink driving arrestees reported having their last drinking in a bar.	Various environmental policies (RBS training, ban on advertising) (Weitzman, 2004; Nelson, 2005; **M)**	↓ drinking and driving	Designated driver program, media campaign, and promotions (Boots & Midford, 1999;**W**)	↔ frequency of being a passenger in a car with a driver with BAC > 0.05
					Community mobilization to reduce youth access to alcohol (Wagenaar, 1999, 2000a, 200b; **M**)	↓ drink-driving arrests among 18-20yr olds; ↔ drink-driving arrests among 15-17 year olds	Patrons receiving free transportation between bars and clubs (Rothschild et al., 2006; **W**)	↓ frequency of impaired driving after two-weeks
					Community mobilization, RBS training, law enforcement (Treno, 2007; **W)**	↓ motor vehicle accidents reported to EMS		
Total	Sig. Effect: 1/1 No Effect: 0/1		Sig. Effect: 1/3 outcomes No Effect: 2/3 outcomes		Sig. Effect:4/5 outcomes No Effect:1/5 outcomes		Sig. Effect: 1/3 No Effect: 2/3	
Injury	N/R		N/R		Community mobilization, media advocacy, RBS training, enhanced enforcement efforts against drink driving and underage drinking, local restrictions on access (Holder, 2000,**M)**	↓ hospitalised assault injuries -2% (95% CI-3%,-1%)	Free taxi service for patrons (Lacey, 2000; **W**)	↓ injury crashes by 15%; ↔ fatal road traffic crashes
Total	Sig. Effect: 0/0 No Effect: 0/0		Sig. Effect: 0/0 No Effect: 0/0		Sig. Effect: 1/1 No Effect: 0/1		Sig. Effect: 1/1 outcomes No Effect: 1/1 outcomes	

Appendix F: Applicability & Transferability Worksheet

Factors	Questions	Notes
Applicability (feasibility)		
Political acceptability or leverage	• Will the intervention be allowed or supported in current political climate? • What will the public relations impact be for local government? • Will this program enhance the stature of the organization? o *For example, are there reasons to do the program that relate to increasing the profile and/or creative a positive image of public health*? • Will the public and target groups accept and support the intervention in its current format?	

Social acceptability	• Will the target population find the intervention socially acceptable? Is it ethical?
	  o *Consider how the program would be perceived by the population.*
	  o *Consider the language and tone of the key messages.*
	  o *Consider any assumptions you might have made about the population. Are they supported by the literature*?
	  o *Consider the impact of your program and key messages on non-target groups.*	

Available essential resources (personnel and financial)	• Who/what is available/essential for the local implementation? • Are they adequately trained? If not, is training available and affordable? • What is needed to tailor the intervention locally? • What are the full costs? o *Consider: in-kind staffing, supplies, systems, space requirements for staff, training, and technology/administrative supports.*	

	• Are the incremental health benefits worth the costs of the intervention? o *Consider any available cost-benefit analyses that could help gauge the health benefits of the intervention.* o *Consider the cost of the program relative to the number of people that benefit/receive the intervention.*	
Organizational expertise and capacity	• Is the intervention to be offered in line with Peel Public Health's 10-Year Strategic Plan (i.e., 2009-2019, 'Staying Ahead of the Curve')? • Does the intervention conform to existing legislation or regulations (either local or provincial)? • Does the intervention overlap with existing programs or is it symbiotic (i.e., both internally and externally)? • Does the intervention lend itself to cross-departmental/divisional collaboration? • Any organizational barriers/structural issues or approval processes to be addressed? • Is the organization motivated (learning organization)? o *Consider organizational capacity/readiness and internal supports for staff learning.*	
Transferability (generalizability)		
Magnitude of health issue in local setting	• What is the baseline prevalence of the health issue locally? • What is the difference in prevalence of the health issue (risk status) between study and local settings? o *Consider the Comprehensive Health Status Report, and related epidemiological reports.*	
Magnitude of the "reach" and cost effectiveness of the intervention above	• Will the intervention appropriately reach the priority population(s)? o What will be the coverage of the priority population(s)?	
Target population characteristics	• Are they comparable to the study population? • Will any difference in characteristics (e.g., ethnicity,	

	socio-demographic variables, number of persons affected) impact intervention effectiveness locally? o *Consider if there are any important differences between the studies and the population in Peel (i.e., consider demographic, behavioural and other contextual factors).*	
Proposed Direction (after considering the above factors):		