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Minimizing harms through controlling alcohol outlet density

Moderated by:
Benjamin Rempel, MPH, benjamin.rempel@oahpp.ca
Acting Manager
Health Promotion Capacity Building, HPCDIP,
Public Health Ontario

March 26, 2014
10:30 a.m. – 11:30 a.m.
Housekeeping

- All phone lines are automatically muted
- Please type questions into the CHAT box
- Tour of the Adobe Webinar Platform
Learning Objectives

• To understand national and international evidence on the relationship between alcohol outlet density and minimized harms and the implications for public health practice.

• To become aware of the opportunities to address and influence alcohol outlet density and related policies.
Poll Questions:

What sector do you represent?

How long have you been working in the area of alcohol policy?

About how many minutes would it take you to get from your home to the nearest liquor or beer store?
Vision
Internationally-recognized evidence, knowledge and action for a healthier Ontario.

Mission
We enable informed decisions and actions that protect and promote health and contribute to reducing health inequities.

Mandate
We provide scientific and technical advice and support to clients working in government, public health, health care, and related sectors.
Areas of Expertise

- Chronic Disease Prevention
- Environmental Health
- Infectious Disease
- Microbiology
- Emergency Preparedness
- Health Promotion
- Injury Prevention
- Occupational Health

PHO Services

- Advice, Consultation and Interpretation
- Information Management
- Library Services
- Professional Development and Education
- Research, Ethics and Evaluation
- Communication and Knowledge Exchange
- Knowledge Synthesis, Tool and Best Practices Development
- Public Health Laboratory Services
- Surveillance and Population Health Assessment
Strategic Directions

1. Provide scientific and technical expertise to strengthen Ontario’s public health sector and support the achievement of its goals
2. Accelerate integrated population health monitoring
3. Enable policy, program and practice action
4. Advance public health evidence and knowledge
5. Great people, exception teams building a stronger PHO
Helpful Information

PHO service request inquiries:
http://www.publichealthontario.ca/en/ServicesAndTools/HealthPromotionServices/Pages/default.aspx

Events Calendar:
http://www.publichealthontario.ca/en/LearningAndDevelopment/Events/Pages/default.aspx

PHO Mailing list / general information:
hpcb@oahpp.ca
Alcohol Policy in Public Health

1. Assessment and Surveillance
2. Health Promotion and Policy Development
3. Disease and Injury Prevention
4. Health Protection

1. Prevention of chronic disease

2. Prevention of injury and substance misuse

3. Reproductive health

Presenters

Norman Giesbrecht, Ph.D.
Senior Scientist Emeritus, Social & Epidemiological Research Department, Centre for Addiction and Mental Health (CAMH), and Associate Professor, Dalla Lana School of Public Health, University of Toronto.

Ashley Wettlaufer, MA
Research Coordinator, Social and Epidemiological Research Department at the Centre for Addiction and Mental Health (CAMH)
Minimizing harms through controlling density of alcohol outlets

Norman Giesbrecht & Ashley Wettlaufer

Centre for Addiction & Mental Health, Toronto

Presented at the Public Health Ontario Webinar
Toronto, Ontario
March 26, 2014
These slides are based, in part, on several resources, as noted below. The views & opinions are those of the presenters.

- J. Rehm presentation at Cancer & Alcohol Forum, Toronto, Nov. 15, 2013
Topics

A. Context

B. International evidence

C. Canadian evidence

D. Challenges

E. Moving forward
A. Context
Major alcohol-related health conditions contributing to morbidity and mortality

T. Babor et al. (2010, p. 49)

- **Cancers**: head and neck cancers, liver cancer, colorectal cancers, female breast cancer.

- **Neuropsychiatric conditions**: alcohol-dependence syndrome, alcohol abuse, depression

- **Diabetes**: (protective and adverse effects)

- **Cardiovascular conditions**: ischemic heart disease, hypertensive disease, cerebrovascular disease (protective and adverse effects of all cardiovascular conditions)

- **Gastrointestinal conditions**: liver cirrhosis, pancreatitis
Major alcohol-related health conditions contributing to morbidity and mortality

T. Babor et al. (2010, p. 49)

- *Maternal and perinatal conditions*: small for gestational age and prematurity, fetal alcohol syndrome and disorders

- *Infectious diseases*: tuberculosis, pneumonia

- *Acute toxic effects*: alcohol poisoning

- *Accidents*: transport injuries, falls, workplace injuries

- *Self-inflicted injuries*: suicide

- *Violent deaths*: assault injuries
Alcohol-related Harms & Social Costs in Canada

- Alcohol is a leading risk factor for death, disease and disability
- A major risk factor for cancers and other types of chronic disease
- Involves significant economic costs
- Associated injuries, trauma, violence and social disruptions and other harms to others
- Interacts with other risk factors to substantially increase health risks
- Contributes to health inequities

Thomas Babor University of Connecticut (USA)
Raul Caetano University of Texas (USA)
Sally Casswell Massey University (New Zealand)
Griffith Edwards National Addiction Centre (United Kingdom)
Norman Giesbrecht University of Toronto (Canada)
Kathryn Graham Centre for Addiction and Mental Health (Canada)
Joel Grube University of California (USA)
Linda Hill University of Auckland (New Zealand)
Harold Holder University of California (USA)
Ross Homel Griffith University (Australia)
Michael Livingston University of Melbourne (Australia)
Esa Österberg Institute for Social Research (Finland)
Jürgen Rehm University of Toronto (Canada)
Robin Room University of Melbourne (Australia)
Ingeborg Rossow National Institute for Alcohol and Drug Research (Norway)
Strategies and Interventions Reviewed and Evaluated

- Pricing and Taxation
- Regulating Physical Availability
- Altering the Drinking Context
- Education and Persuasion
- Regulating Alcohol Promotion
- Drinking-Driving Countermeasures
- Treatment and Early Intervention
Ratings of 42 Policy-relevant Prevention Strategies and Interventions

1) Evidence of Effectiveness\textsuperscript{a} – the quality of scientific information
2) Breadth of Research Support\textsuperscript{a} – quantity and consistency of the evidence
3) Tested Across Cultures\textsuperscript{a}, e.g. countries, regions, subgroups

\textsuperscript{a}Rating Scale: 0, +, ++, +++, (?)
Best Practices (Babor et al. 2010)

- Minimum legal purchase age
- Government monopoly
- Restriction on hours or days of sale, outlet density
- Alcohol taxes
- Lower alcohol strength
- Random Breath Testing
- Lowered BAC limits
- Administrative license suspension
- Graduated licensing for novice drivers
- Brief interventions for hazardous drinkers
- Treatment and detox
CPHA Position Paper on Alcohol
Alcohol Working Group Members

- **Nicole April**, Médecin-conseil, Institut national de santé public du Québec
- **Amy Beck**, Community Public Health Nurse, Alberta Health Services
- **Sandra Bullock**, Associate Professor, Dept. of Health Studies & Gerontology, University of Waterloo, Ontario
- **Lyne Cantin**, Senior Policy Analyst, Canadian Public Health Association
- **Denise De Pape**, Director, Alcohol Harm Reduction, British Columbia Ministry of Health
- **Norman Giesbrecht**, Senior Scientist, Centre for Addiction & Mental Health, Ontario
- **Robert Strang**, Chief Public Health Officer of Health, Dept. of Health & Wellness, Nova Scotia
Recommendations
For a multi-dimensional & comprehensive response

Population-based Policies & Interventions

- Alcohol pricing policies
- Controlling physical & legal availability
- Curtailing alcohol marketing
- Regulating and monitoring alcohol control systems
B. International Evidence
Retail Outlet Density & Alcohol-Related Harm

Research in several countries (Popova et al. 2009) has shown a positive association between alcohol outlet density and the following:

- Level of overall alcohol consumption
- Injuries and traffic crashes
- Liver cirrhosis and other chronic conditions
- Violence, including suicide
- Sexually transmitted diseases
An association between alcohol outlet density and gonorrhea was shown in a longitudinal analysis (Cohen et al. 2006).

Alcohol outlet density and rates of violence were associated in research by Gruenewald and Reimer (2006).

Alcohol outlet density was associated with injuries, drinking and driving and crashes, in investigations by Treno and colleagues (2001, 2003, 2007)
Australian Studies

This topic has been examined in recent years in publications by Michael Livingston and colleagues. (Livingston, 2008, 2012, Livingston et al. 2007, 2008)
In Melbourne the density of liquor licenses was positively associated with rates of domestic violence over time.

The effects were particularly large for packaged liquor outlets, suggesting a need for licensing policies that pay more attention to off-premise alcohol availability.

The researchers found a 10% increase in packaged liquor density associated with a 3.3% increase in domestic violence and a 2% increase in rates of admission to hospital.
Implications of outlet density, type and concentration on alcohol consumption & harm

Michael Livingston

Seminar @ CAMH, Toronto. 25/4/2012
Other Australian studies

- Cross-sectional studies have demonstrated that neighbourhoods with higher densities of outlets have:
  - Higher rates of domestic violence
  - Higher rates of general assault
  - Higher rates of very high-risk drinking amongst young adults
  - Increased amenity issues


Other Implications

- An examination of how alcohol outlet density may contribute to socio-economic inequalities in health outcomes
  - Found significantly higher rates of packaged liquor in disadvantaged neighbourhoods
    - Depending on measurement, up to 8 times as many in the poorest decile compared to the richest
  - In rural areas, all types of outlets clustered in areas of disadvantage
  - In Melbourne pubs were more prevalent in advantaged areas
    - Largely gentrified areas in and around the inner city

Summarising the findings from Livingston et al.

<table>
<thead>
<tr>
<th></th>
<th>Pubs</th>
<th>Bottleshops</th>
<th>Restaurants/bars</th>
</tr>
</thead>
<tbody>
<tr>
<td>General assault</td>
<td>↑</td>
<td>↑</td>
<td></td>
</tr>
<tr>
<td>Domestic violence</td>
<td></td>
<td>↑</td>
<td></td>
</tr>
<tr>
<td>Youth heavy drinking</td>
<td></td>
<td>↑</td>
<td></td>
</tr>
<tr>
<td>Chronic disease</td>
<td></td>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>Socio-economic disadvantage</td>
<td>↓</td>
<td>↑</td>
<td>↓</td>
</tr>
</tbody>
</table>
Overall conclusions: Victoria, Australia

- Deregulation of liquor licensing was an ongoing project through the 1980s and 1990s

- Focus of legislative changes was largely competition and economic development

- Deregulation lead to substantial growth in alcohol availability, both in terms of numbers of outlets and hours of trade
The increases in availability have occurred concurrently with substantial increases in harm rates.

Specific studies have demonstrated links between alcohol outlet density, chronic disease and domestic and general violence in Victoria in the last decade.

Further studies (e.g. Newcastle, AU, trading hours) have demonstrated substantial reductions in harm following licensing restrictions.
Alcohol outlet density and policy

- Increasingly incorporated into policy in Australia and internationally
  - California restricts on- and off-premise licences on a per-capita basis (e.g. one on-sale general licence per 2,000 people living in a county)
  - Violent Crime Reduction Act (2006) in the U.K. includes provisions to make licensees pay the costs of alcohol-related crime in ‘Alcohol Disorder Zones’ where a concentration of premises has led to high rates of problems
  - Key issue fought out in liquor licensing hearings across Australia
A multi-state analysis of acute alcohol use and suicide: Impact of alcohol availability

LA Ogden,¹ N Giesbrecht,² N. Huguet,¹ R Caetano,³ KR Conner,⁴ MS Kaplan,¹ BH McFarland,⁵ KB Nolte⁶

¹. Portland State University 2. Centre for Addiction & Mental Health 3. University of Texas Dallas Regional Campus 4. University of Rochester 5. Oregon Health & Science University 6. University of New Mexico School of Medicine

141st Annual Meeting of the American Public Health Association

Boston, November 3-6, 2013
Institute of Medicine recommended the creation of the national fatal intentional injury surveillance system in 1999.

Principal data sources: (1) death certificates, (2) police reports, (3) coroner and medical examiner records, and (4) crime lab reports.

A database with extensive demographic, toxicological, mental health and life event information.

Nearly two-thirds of NVDRS states have centralized medical examiner systems.

The NVDRS count of violent death is highly accurate (Barber et al. 2013).
Suicide incidents  
N = 72,902  

14 States included*  
N = 67,024 (92%)  

County data**  
N = 64,517 (96%)  

BAC data***  
N = 44,225 (69%)  

*Density data for OH, MI, UT, RI were not collected (N = 5,878).
**County of residence was unknown for 4% of the suicide cases (N = 2,507)
***Suicide decedents tested for BAC with results
AGE-ADJUSTED SUICIDE RATES IN NVDRS STATES

<9 per 100k  9-<12 per 100k  12-14 per 100k  >14 per 100k
VARIABLES

- **Toxicology**: Blood alcohol contents (BAC) were treated as continuous (weight by volume) and then coded as present (BAC>0) and absent (BAC=0) and as BAC< 0.08 and ≥ 0.08 g/dl.

- **Death certificate**: Sex, age, race/ethnicity, suicide methods

- **Alcohol outlet density**: County off-premise liquor licenses numbers (from state alcohol licensing division) divided by Census 2010 county population aged 18 and older * 10,000. Alcohol outlet density varies from 0 (dry counties) to 210 stores per 10,000 population
ANALYSIS

• Prevalence and means of acute alcohol use by gender was estimated.

• Hierarchical linear models were used to test the effect of county-level alcohol outlet density on individual BAC levels

• Models adjust for and stratified by age, gender, race/ethnicity, and suicide methods
### Effect of Alcohol Availability on BAC+

<table>
<thead>
<tr>
<th>Outlet density</th>
<th>Reg. Coef.</th>
<th>SE</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>All decedents</td>
<td>0.003</td>
<td>0.001</td>
<td>0.027</td>
</tr>
<tr>
<td><strong>Men</strong></td>
<td>0.004</td>
<td>0.002</td>
<td>0.006</td>
</tr>
<tr>
<td>women</td>
<td>-0.002</td>
<td>0.003</td>
<td>0.393</td>
</tr>
<tr>
<td>White</td>
<td>0.002</td>
<td>0.001</td>
<td>0.247</td>
</tr>
<tr>
<td>Black</td>
<td>0.000</td>
<td>0.004</td>
<td>0.919</td>
</tr>
<tr>
<td><strong>American Indian / Alaska Native</strong></td>
<td><strong>0.031</strong></td>
<td><strong>0.009</strong></td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Asian / Pacific Islander</td>
<td>0.003</td>
<td>0.014</td>
<td>0.808</td>
</tr>
<tr>
<td><strong>Hispanic</strong></td>
<td><strong>0.023</strong></td>
<td><strong>0.007</strong></td>
<td><strong>0.001</strong></td>
</tr>
<tr>
<td>Firearm</td>
<td>0.003</td>
<td>0.002</td>
<td>0.105</td>
</tr>
<tr>
<td>Hanging</td>
<td>0.002</td>
<td>0.003</td>
<td>0.366</td>
</tr>
<tr>
<td>Poisoning</td>
<td>0.001</td>
<td>0.003</td>
<td>0.791</td>
</tr>
<tr>
<td>Other suicide method</td>
<td>0.005</td>
<td>0.005</td>
<td>0.276</td>
</tr>
</tbody>
</table>

Note: Regression coefficients represent the effect of county-level alcohol outlet density on the proportion of BAC positive suicides stratified by each demographic characteristics and suicide method. Outlet density varies from 0 to 210. Models adjusted for gender, age, race, and suicide method.
MAIN FINDINGS

- Greater availability of alcohol is associated with higher proportion of alcohol-related suicides.

- The relationship between alcohol availability and alcohol-related suicide is strongest among American Indian/Alaska Natives and Hispanics.

- Subsequent analysis, underway, shows a significant relationship with on-premise outlet density.
C. Canadian Evidence
Privatization & Suicide

- The impact of privatization of retail sale of alcohol in Alberta, in three stages, between 1985 and 1995 on mortality rates from suicide was examined.
- Interrupted time series analysis with Auto Regressive Integrated Moving Average (ARIMA) modeling was applied to male and female suicide rates to assess the impact of the three stages of privatization.
- The analyses demonstrated that most of the privatization events resulted in either temporary or permanent increases in suicide mortality rates.
- Other alcohol-related factors, including consumption levels and Alcoholics Anonymous (AA) membership rates, also affected suicide mortality rates.
- **These analyses suggest that privatization in Alberta has acted to increase suicide mortality rates in that province.**

[Flam-Zaltman & Mann, 2007]
The study relationships between rates of alcohol-related deaths and (i) the density of liquor outlets and (ii) the proportion of liquor stores owned privately in British Columbia (BC) during a period of rapid increase in private stores.

Multi-level regression analyses assessed the relationship between population rates of private liquor stores and alcohol-related mortality after adjusting for potential confounding. The 89 local health areas of BC, Canada across a 6-year period from 2003 to 2008, for a longitudinal sample with \( n = 534 \).

Population rates of liquor store density, alcohol-related death and socio-economic variables were obtained from government sources.
The total number of liquor stores per 1000 residents was associated significantly and positively with population rates of alcohol-related death ($P < 0.01$). A conservative estimate is that rates of alcohol-related death increased by 3.25% for each 20% increase in private store density. The percentage of liquor stores in private ownership was also associated independently with local rates of alcohol-related death after controlling for overall liquor store density ($P < 0.05$).

Alternative models confirmed significant relationships between changes in private store density and mortality over time.

The rapidly rising densities of private liquor stores in British Columbia from 2003 to 2008 was associated with a significant local-area increase in rates of alcohol-related deaths.

[Stockwell et al. 2011]
Density & Violence - 1

- Study assessed the risk of being hospitalized due to assault in association with retail alcohol sales across Ontario.
- Researchers performed a population-based case-crossover analysis of all persons aged 13 years and older hospitalized for assault in Ontario from 1 April 2002 to 1 December 2004.
- On the day prior to each assault case's hospitalization, the volume of alcohol sold at the store in closest proximity to the victim's home was compared to the volume of alcohol sold at the same store 7 days earlier.
- Conditional logistic regression analysis was used to determine the associated relative risk (RR) of assault per 1,000 litres higher daily sales of alcohol.
Of the 3,212 persons admitted to hospital for assault, nearly 25% were between the ages of 13 and 20 y, and 83% were male. A total of 1,150 assaults (36%) involved the use of a sharp or blunt weapon, and 1,532 (48%) arose during an unarmed brawl or fight.

For every 1,000 l more of alcohol sold per store per day, the relative risk of being hospitalized for assault was 1.13 (95% confidence interval [CI] 1.02–1.26). The risk was accentuated for males (1.18, 95% CI 1.05–1.33), youth aged 13 to 20 y (1.21, 95% CI 0.99–1.46), and those in urban areas (1.19, 95% CI 1.06–1.35).

The risk of being a victim of serious assault increases with alcohol sales, especially among young urban men. Akin to reducing the risk of driving while impaired, consideration should be given to novel methods of preventing alcohol-related violence. [Ray et al. 2008]
Strategies to Reduce Alcohol-Related Harms and Costs in Canada
Giesbrecht et al., 2013

- CIHR funded multi-province project
- 18 team members: Researchers and KT specialists
- 10 policy dimensions, 70 indicators
  - Pricing
  - Alcohol control system
  - Physical Availability
  - Drinking and Driving
  - Marketing and Advertising
  - Legal Drinking Age
  - SBIR
  - Server Training and Challenge and Refusal Programs
  - Provincial Alcohol Strategy
  - Warning labels and signs
Physical Availability

Physical Availability Indicator Scores (% of ideal score)

- a. Regulations pertaining to outlet density
- b. Outlet density, off-premise outlets
- c. Outlet density, on-premise outlets
- d. Hours of operation

(Giesbrecht et al., 2013)
Per Capita Outlet Density Across the 10 Canadian Provinces

Outlet Density: outlet type and province

2010/2011 data, includes FOPs (Giesbrecht et al., 2013)
Approx. 80% are within a 5-10 minute commute to a retail outlet.

Giesbrecht & Ialomiteanu, Alcohol Policy 16, 2013
Sales channels beyond on-premise and off-premise outlets

<table>
<thead>
<tr>
<th>Province</th>
<th>FOP Outlets</th>
<th>Ferment at home kits</th>
<th>Online sales</th>
<th>Liquor delivery services</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>AB</td>
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<td>SK</td>
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<td>NL</td>
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<td></td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

* There is one FOP outlet that is government run

All provinces have sale beyond on-premise and off-premise outlets
Final Provincial Rankings for Physical Availability (Giesbrecht et al., 2013)

Physical Availability Scores (% of ideal score)

The average score is below 40%, there is lots of room for improvement!!
Municipal Opportunities to Regulate Outlet Density (Canadian Case Studies)

*Municipal Alcohol Policies: Options for Nova Scotia Municipalities (2013)*

- **Zoning and land-use bylaws**
  - Restrictions by type of licence, and size of outlet
  - Separation distance - limits exposure by youth
  - Distance between outlets (Alberta: 500 meters)
  - Additional safety measures (e.g. additional lighting, signage, etc.)

- **Municipal Alcohol Policies (MAP)** - encourage environmental shift that limits access of alcohol

- Providing opportunity for citizen input
- Alcohol fee - help pay for enforcement costs
- Operational standards - require server training
D. Challenges
Challenges in measuring outlet density

- How do we define outlet density?
  - Geographical density: number of outlets in a given region (clustering, and walkability)
  - Population density: number of outlets per 10,000 capita
- Are all outlets created equal?
  - Off-premise, on-premise, FOPs, other
  - Number of alcohol access points vs. shelf space (off-premise) vs. capacity limits (on-premise)
Challenges in measuring outlet density

- Tracking of licenses and license types
  - One licence, multiple locations (and vice versa)
  - Multi year licenses, and SOPs
  - A license is not always required (home brew sales)
- Availability of data
- Required resources
- Who should be responsible for this?
  - Recommendations: WHO and Giesbrecht et al., 2013
E. Moving Forward
Address public, media and policy-making misconceptions or limitations

- Not aware of many risks of increasing access, such as higher density or extended hours of sale

- Precautionary policies are designed to reduce harm **not** prohibit alcohol

- Media advocacy for a balanced approach
  - Currently often blind to precautionary issues, tend to focus on convenience or business angles

- Promoting full-cost accounting

- Reforming the policy process
  - Are public health issues central from the outset or considered in passing when decision is more-or-less final?
Be aware of vested interests

- Oppose many effective policies
- Devote resources to those with little or unproven impact
Take advantage of emerging opportunities

- Ontario Public Health units advocating to retain monopolies
- Introducing community and public health consultations before expanding alcohol outlets
- Explore how to locally control N of outlets and hours of sale through bylaws
Consider the policy environment

Alcohol outlet density is related to other alcohol policy dimensions

- Type of control/retailing system
- Hours and days of sale
- Pricing and taxation
- Alcohol promotion and advertising
- Serving practices
- Who is at the decision-making table
Contact Information

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Centre for Addiction & Mental Health
33 Russell St. Toronto, Ontario, Canada M5S 2S1
Minimizing harms through controlling density of outlets

Webinar on March 26, 2014: Citations and resource documents


[This is the article that talks about the impact of density on underage drinking]


