In preparation:

The impact of raising minimum alcohol prices in Saskatchewan, Canada:
Improving public health while raising government revenue?

Tim Stockwell¹², Jinhui Zhao¹, Norman Giesbrecht³, Scott Macdonald¹⁴, Gerald Thomas¹⁵ and Ashley Wettlaufer³

¹ Centre for Addictions Research of British Columbia, University of Victoria, BC, Canada
² Department of Psychology, University of Victoria, BC, Canada
³ Centre for Addiction and Mental Health, Ontario, Canada
⁴ School of Health Information Sciences, University of Victoria, BC, Canada
⁵ Canadian Centre on Substance Abuse, Ottawa, Ontario, Canada

Address for correspondence:

Dr Tim Stockwell
Centre for Addictions Research of British Columbia, University Victoria
PO Box 1700 STN CSC, Victoria, BCV8Y 2E4, Canada

e-mail: timstock@uvic.ca

Telephone: 1 250 472 5445
Abstract

We report outcomes from the implementation of an alcohol price policy change in the Canadian province of Saskatchewan. Substantial increases in the minimum prices of beers and smaller increases for other alcoholic products were introduced 1 April 2010 with some price adjustments for alcohol content: for each beverage type, minimum prices were higher for stronger varieties. Analysis of detailed alcohol sales data from the Saskatchewan government alcohol monopoly over 39 financial periods, with 26 periods before the intervention and 13 periods afterwards, confirmed significant reductions in sales of beer, coolers and cocktails. ARIMA time series models suggested that increases in minimum price significantly reduced consumption of beer, cocktails and coolers as well as total alcohol consumption. A significant shift in consumption from high-strength to low strength beers and coolers also occurred. Results indicate that minimum pricing is a promising strategy for reducing the public health burden associated with hazardous alcohol consumption while simultaneously increasing government revenue.

Word count: 3,306

Keywords: Alcohol consumption, minimum pricing, prevention, policy, economics, Canada
Does Minimum Alcohol Pricing Work? Case Studies from Canada

Tim Stockwell
Director, Centre for Addictions Research of BC and Professor, Department of Psychology, University of Victoria, www.carbc.ca

Presentation to Members of Scottish Health and Sport Committee, Edinburgh, Scotland, January 10, 2012
The risk of alcohol related harms is dose dependent – for both acute and chronic harms and for individuals and populations.
Relative risk function and confidence interval for breast cancer

Alcohol consumption in g pure alcohol per day

Relative Risk
Relative risk function and confidence interval for oesophagus cancer

Relative Risk vs. Alcohol consumption in g pure alcohol per day
UK Trends in Alcohol-related Hospitalisations, ’95/96→’05/06

Source: ONS, 2008
Principle of using price to control alcohol use is well-established

Meta-analysis by Gallet (2007):
Identified 132 studies, 1945-2003 and concludes:

- A 10% increase in price leads to an average of a 5% decrease in consumption

Identified 112 studies worldwide (1823-2007) with 1007 estimates and conclude:

- A 10% increase in price leads to a 4.4% decrease in consumption and 2.8% for heavy drinkers
Impact of price and taxation

When price of alcohol goes up studies show reduced rates of:

Alcohol-dependence (Farrell et al, 2003; Cook et al, 2002)

Liver cirrhosis, road trauma and assaults (Babor et al, 2003; Wagenaar et al, 2010)

STDs (Wagenaar et al, 2010)

Alcohol-related mortality and morbidity (Chaloupka et al, 2002; Chikritzhs et al, 2005; Wagenaar et al, 2010)
Importance of minimum liquor prices

The top 10% of drinkers (i.e., highest risk) pay 79c, bottom 50% pay $4.75 per standard drink (Kerr & Greenfield, 2007).

Young people and high risk drinkers especially responsive to minimum prices (Meier et al, 2009).

BC and most other Canadian jurisdictions retain the ability to set minimum liquor prices.
Reducing Alcohol-Related Harm in Canada: Toward a Culture of Moderation

Recommendations for a National Alcohol Strategy
April 2007

Developed by
The National Alcohol Strategy Working Group
National Alcohol Strategy Recommendation 26:

All jurisdictions adopt minimum “social reference” prices for alcohol indexed to CPI. Annual review of alcohol pricing throughout Canada to report compliance.
Minimum prices in Canadian jurisdictions

- Eight out of ten provinces have minimum pricing in government and private liquor stores, excluding Alberta and Quebec.

- Trade agreements have influenced these downwards.

- Eight out of ten provinces have minimum pricing in bars, restaurants and hotels, ranging from $1.65–$3.55 per drink.

- Some jurisdictions (e.g. Quebec) index some beverage minimum prices to adjust for inflation.

- MANY LOOPHOLES e.g. Ubrew and de-listed products.
Comparing minimum prices in dollars per standard drink in British Columbia, Ontario and Saskatchewan

<table>
<thead>
<tr>
<th>Beverage</th>
<th>% Alcohol Content</th>
<th>BC Official Minimum*</th>
<th>Ontario Minimum Price*</th>
<th>Saskatchewan Minimum Price*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fortified wine</td>
<td>22%</td>
<td>$0.56</td>
<td>$0.81</td>
<td>$1.04</td>
</tr>
<tr>
<td>Coolers/Cider</td>
<td>7%</td>
<td>$0.73</td>
<td>$1.00</td>
<td>$1.25</td>
</tr>
<tr>
<td>Beer</td>
<td>8%</td>
<td>$0.75</td>
<td>$1.00</td>
<td>$1.49</td>
</tr>
<tr>
<td>Wine</td>
<td>12%</td>
<td>$1.02</td>
<td>$1.00</td>
<td>$1.41</td>
</tr>
<tr>
<td>Spirits (Tequila)</td>
<td>40%</td>
<td>$1.35</td>
<td>$1.43</td>
<td>$1.31</td>
</tr>
<tr>
<td>Spirits (Rum)</td>
<td>75.4%</td>
<td>$0.72</td>
<td>$0.76</td>
<td>$1.04</td>
</tr>
</tbody>
</table>
Canadian Provinces and Territories
Case Study 1: British Columbia

- The British Columbia government alcohol monopoly has set minimum prices for over two decades.

- Only spirit prices have been updated in keeping with the cost of living whereas minimum prices for all other beverages have become cheaper in real terms.

- When the government chooses to raise minimum prices it makes front-page news and is done basically to maintain revenue not for public health reasons.

- A complication: the government monopoly has been partially privatised though minimum prices still affect prices in private liquor stores.
Figure 1. Minimum price of alcohol beverages (CPI-adjusted dollars per drink, CPI in 2000=100 and 1 drink=17.05 ml) in British Columbia in 1989-2010
Statistical analysis of British Columbia price and sales data

Time series analysis of 80 annual quarters of data between April 1989 and March 2010 controlling for the effects of:

- Season
- Overall trends in data
- Trends in average alcohol prices
- Trends in household income

Inflation-adjusted minimum prices used to predict volume of alcohol sales for each main beverage.
Estimates of minimum “price elasticities” for different types of alcohol

Percentage decrease in consumption of ethanol for a 10% increase in minimum price:

- ANY DRINK VERSUS REST: -16.1%
- Beer = - 1.5%*
- Spirits = - 6.8%**
- Wine = - 8.9%*
- Coolers = - 13.9% (borderline significance)
- ALL DRINKS = - 3.4%**
Estimated effect on acute alcohol-related hospital admissions/discharges

Preliminary analysis examining eight years of detailed hospitalisation data across 89 geographical areas of British Columbia suggests that:

- A 10% increase in minimum drink prices results in a 4% reduction in acute alcohol-related hospitalisations.
- A less pronounced effect for chronic alcohol-related hospitalisations.

Case Study 2: Saskatchewan

• Late 2009, request to alcohol distribution monopoly from provincial government to raise extra revenue to compensate for unexpected shortfall in revenue from provincial potash sales taxes

• Public health inspired proposal to adjust all minimum prices with higher rates for higher strength beverages

• Four strength categories for beer (<6.5% to >8.5%) with minimum prices set between $1.58 and $2.48

• Two strength categories for wine, 2 for alcopops and 5 for spirits
Figure 1. Percentage of per capita drinks in each period to average of period per capita drinks in Saskatchewan for fiscal years 2008-2010

Min price by strength since April 2010

% of period per capita drinks

Periods in fiscal years

[Graph showing percentage of per capita drinks over fiscal years 2008-2010, with min price by strength since April 2010.]
Statistical analysis of Saskatchewan price and sales data

ARIMA time series analysis of 39 “financial periods” between April 2008 and March 2011 controlling for the effects of:

- Season
- Overall trends in data
- Trends in average alcohol prices
- Trends in household income

Inflation-adjusted minimum prices used to predict volume of alcohol sales for each main beverage
Estimates of minimum “price elasticities” for different types of alcohol

Preliminary analyses indicate:

- Similar overall effects to British Columbia
- Stronger effects for beer and other beverages
- Stronger effects for off premise then on premise sales
- Stronger effects for higher alcohol strength varieties of beer, wine and spirits
Figure 1A. % of the ethanol consumption of beer by strength in Saskatchewan in 2008-2010

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;6.5%</td>
<td>1.51</td>
<td>1.39</td>
<td>0.64</td>
</tr>
<tr>
<td>&lt;=6.5%</td>
<td>98.50</td>
<td>98.60</td>
<td>99.36</td>
</tr>
</tbody>
</table>
Conclusions

- Minimum pricing is implemented inconsistently across Canada with differing impacts on consumption.
- Several loopholes permit sales of very cheap alcohol and minimum prices often do not keep pace with inflation.
- However, periodic increases in the minimum price rates trigger reductions in consumption and some harms.
- Reductions in consumption are more likely when the minimum price is relatively close to average prices.
- Reductions in ethanol consumption are greater when there are across the board increases for all beverage types, especially when these match beverage strength.
Is minimum pricing a well-targeted strategy?

- All pricing strategies have most impact on heavier drinkers
- Minimum pricing especially targets heavier and younger drinkers because they mostly prefer cheaper drinks
- Minimum prices can be adjusted so they are higher for more hazardous products (e.g. high-strength beer)
- A high proportion (about two thirds) of all alcohol consumption is inconsistent with low risk drinking guidelines (data from UK, Australia and Canada)
- Further studies are needed to confirm predicted disproportionate impact on alcohol-related harms
Thank you!