CCSA - CCLAT

Canadian Centre on Substance Abuse
... Working to reduce alcohol- and drug-related harm

Centre canadien de lutte contre l'alcoolisme et les toxicomanies
... œuvrer à la réduction des méfaits liés à l'alcool et aux drogues

Price Policies to Reduce Alcohol-Related Harm in Canada

Alcohol Price Policy Series, Report 3 of 3

November 2012

Gerald Thomas — Senior Research and Policy Analyst
Canadian Centre on Substance Abuse

Alcohol Price Policy Series

Levels and Patterns of Alcohol Use in Canada (Report 1)

Analysis of Beverage Alcohol Sales in Canada (Report 2)

Price Policies to Reduce Alcohol-Related Harm in Canada (Report 3)

Alcohol Price Policy Series: Reducing Harm to Canadians (Policy Brief)

This document was published by the Canadian Centre on Substance Abuse (CCSA).

CCSA activities and products are made possible through a financial contribution from Health Canada. The views of CCSA do not necessarily represent the views of the Government of Canada.

Suggested citation: Thomas, G. (2012). *Price policies to reduce alcohol-related harm in Canada.* (Alcohol Price Policy Series: Report 3). Ottawa, ON: Canadian Centre on Substance Abuse.

CCSA, 75 Albert St., Suite 500
Ottawa, ON K1P 5E7
Tel.: 613-235-4048
Email: info@ccsa.ca

This document can also be downloaded as a PDF at www.ccsa.ca

Ce document est également disponible en français sous le titre :

Niveaux et profils de consommation d'alcool au Canada

ISBN 978-1-927467-29-9

Table of Contents

About the Alcohol Price Policy Series

This series of three reports provides context and evidence to support the implementation of the price policy recommendations contained in the National Alcohol Strategy (NAS). It is most relevant for analysts and decision makers, both inside and outside government, with interest in the topic of alcohol pricing policy:

- The first report presents a summary of data on the levels and patterns of alcohol use in Canada, focusing on trends in risky drinking from 2003 to 2010.
- The second report discusses the economic and governmental context of retail alcohol sales by providing, among other things, a comparison of the direct revenue and costs of alcohol at the provincial/territorial level with the latest available data (2002–03).
- The third report summarizes the evidence on the effectiveness of price policies for reducing alcohol consumption and alcohol-related harm and costs, and presents information on alcohol pricing policies from six provinces.

Executive Summary

Like so many other products, the demand for alcohol is inversely related to price: when the price increases, sales decrease if other factors such as income are kept constant. Several decades of international research show that increasing or maintaining the overall price of alcohol is one of the most effective ways to reduce both alcohol consumption and alcohol-related harm at the population level. Canada is fairly unique in that provincial and territorial governments are the leading retailers of beverage alcohol in all but one jurisdiction. This means governments have direct control over almost all aspects of alcohol pricing policy—and have used that control for decades to generate substantial revenue that funds a variety of programs and services for improving public health and safety.

Emerging research and practice suggest it is possible to improve the ability of alcohol prices to curb risky drinking by implementing policies that better target regular risky drinkers (Gruenewald et al., 2006; Meier, Purshouse & Brennan, 2010; Purshouse et al., 2010; Thomas, 2012c). Policies that target regular risky drinkers do not, however, address all sources of alcohol-related harm in society because a substantial proportion of harm comes from the relatively large number of moderate-risk drinkers who only occasionally drink in risky ways. This is the "prevention paradox" that applies to the consumption of beverage alcohol in Canada. Because of this paradox, a combination of population-level policies (e.g., indexing prices to inflation) and targeted policies (e.g., minimum prices) are needed to address all sources of alcohol-related harm in Canada.

This report reviews research findings from several disciplines that suggest pricing policies can be useful for reducing consumption, harm and costs among both occasional and regular risky drinkers. These findings include:

- Price policies, including the establishment of minimum prices, are among the most effective approaches for reducing alcohol consumption at the population level.
- Price policies are effective for reducing many types of alcohol-related harm.
- Indexing alcohol prices to inflation ensures prices do not decrease relative to other goods over time, therefore preserving their ability to protect public health and safety.
- Minimum price policies may be especially effective for reducing consumption among higher risk drinkers because these drinkers tend to purchase more lower priced alcohol.
- Tailoring price policies to affect certain drinkers and products may affect specific types of alcohol-related harm (e.g., violence).
- Young adult drinkers are especially price sensitive because of their relatively lower average levels of income and higher consumption levels.
- Pricing based on alcohol content can reduce per capita alcohol consumption and harm.

Taken together, these findings suggest three principles to inform the development of more effective alcohol price policies:

1. Index alcohol prices to inflation to preserve their real value over time relative to other goods.
2. Base prices (including minimum prices) on alcohol content, creating price incentives for lower strength (i.e., less hazardous) products and price disincentives for higher strength products.

3. Focus on minimum prices to remove the inexpensive sources of alcohol favoured by young adults and other higher risk drinkers.

These pricing principles potentially address both types of risky drinkers, occasional and regular. More specifically, indexing prices to inflation and pricing based on alcohol content are well suited for addressing the relatively large number of people who only occasionally drink in risky ways. Minimum pricing, on the other hand, will be more effective for reducing consumption among regular heavy drinkers (Thomas, 2012a). These policies could reduce alcohol-related harm, while simultaneously increasing government revenue from alcohol when mark-ups are based on price (Thomas, 2012b). In other words, implementing these pricing principles has the potential to create "wins" for public finance as well as public health and safety.

One approach that efficiently integrates all three pricing principles discussed above is to establish an effective minimum price per standard drink for different settings (e.g., bars, clubs, liquor stores), apply these prices universally for all products, and adjust the minimum price with inflation at least annually.

A second complementary policy is to adjust alcohol mark-up schedules to create price incentives for lower strength alcohol products and price disincentives for higher strength products within beverage categories. This policy would be less targeted than minimum prices but would contribute to reducing per capita alcohol intake, thereby facilitating reductions in alcohol-related harm and costs.

A third complementary policy is to adjust all alcohol prices at least annually to keep pace with inflation. Although this is the least targeted policy of all, adjusting prices with inflation will help curb risky consumption across the population and therefore address the relatively large number of people who engage in risky drinking at least occasionally.

After reviewing the available evidence, the National Alcohol Strategy Working Group (NASWG) included versions of these three pricing policies in Canada's first National Alcohol Strategy (Stockwell, Leng & Sturge, 2006; NASWG, 2007). Most jurisdictions in Canada already incorporate elements of the three policies in their alcohol pricing systems. For example, many jurisdictions increase prices on fortified wines to reflect their higher alcohol content and risk. However, no jurisdiction applies all three recommended principles systematically to create comprehensive incentives to reduce per capita alcohol consumption and harm. This report, particularly Appendix A, serves as a baseline for analysts and decision makers to assess their current approaches and determine future enhancements to their alcohol pricing systems and policies.

While the evidence is accumulating on the effectiveness of targeted price policies for addressing risky drinking, several gaps in information remain. Recommendations for specific research projects to fill these knowledge gaps are provided in Appendix B.

1. Introduction

Although there are important differences between beverage alcohol and other commodities, alcohol is like many other products in that demand is inversely related to price: when the price of alcohol increases, sales decrease if other factors such as income are kept constant. Several decades of international research show that increasing the price of alcohol through interventions such as excise taxes, for example, is one of the most effective approaches for reducing consumption and alcohol-related harm at the population level (Wagenaar, Salois & Komro, 2009; Babor et al., 2010). Alcohol price policies also have the added benefit of generating revenue for governments, which is then used to fund a variety of programs and services for improving public health and safety.

Despite these benefits, alcohol price policies can be unpopular with the public who perceive them as "punishing the many for the sins of the few." However, regular heavy drinkers are affected by pricing interventions to a greater degree than lighter drinkers simply because they spend more on alcohol. Further, there is evidence that light drinkers can save more from reduced social costs than they pay in additional alcohol taxes when prices increase because of the relatively little amount they spend overall on alcohol (Cook, 2008). More importantly, emerging research and practice now suggest it is possible to make price policies more efficient using approaches that better target regular risky drinkers (Gruenewald, et al., 2006; Meier, Purshouse & Brennan, 2010; Purshouse, et al., 2010; Thomas, 2012c).

Policies that target regular risky drinkers are not enough, however, to address all sources of alcohol-related harm in society because at least half of the health and social harm associated with alcohol comes from the relatively large number of moderate-risk drinkers who only occasionally drink in risky ways (Stockwell, Zhao & Thomas, 2009). This is the "prevention paradox" that applies to the use of beverage alcohol in Canada (Thomas, 2012a).1 As such, a combination of population-level policies with more generalized effects on the drinking population (e.g., indexing prices to inflation) and policies targeting regular risky drinkers (e.g., minimum prices, pricing based on alcohol content) are needed to address all sources of alcohol-related harm in Canada (NASWG, 2007).

This report reviews research findings from several social science disciplines regarding the effectiveness of price policies to reduce alcohol related consumption, harm and costs. Appendix A uses three promising pricing principles (indexing prices to inflation, pricing based on alcohol content, minimum prices) as a framework to compare pricing policies in six provinces: British Columbia, Alberta, Saskatchewan, Ontario, Quebec and New Brunswick.

[1] The "prevention paradox" is that focusing only on high-risk (regular heavy) drinkers, while seemingly rational, leaves unaddressed the substantial amount of alcohol-related harm that comes from moderate-risk drinkers who drink in risky ways less frequently.

2. Research Findings

This section reviews research findings and identifies guiding principles for price policies to reduce risky drinking among both moderate- and high-risk drinkers. First, research on the effectiveness of pricing for reducing alcohol consumption and harm at the population level is examined. Then, specific findings related to targeted policies that focus their effects on higher risk drinkers are discussed.[2]

2.1 Price policies are effective for reducing alcohol consumption

Numerous studies conducted across a number of jurisdictions have verified the effectiveness of price policies for reducing consumption of alcohol at the population level. These findings derive from the "law of demand," which states that demand for a non-luxury good or service is inversely related to its price. Economists use "price elasticity of demand" to measure the effect of price changes on the demand for a good. Price elasticity measures the percentage change in demand associated with a percentage change in price. For example, a price elasticity of -0.46 indicates that a 10% increase in price would lead to a 4.6% decline in demand for a product or service.

Wagenaar and colleagues (2009) have published the most comprehensive meta-analysis of the effects of alcohol prices to date, drawing from 112 different studies and more than 1,000 estimates of price elasticity of demand for alcohol. Their review documented significant relationships ($p < 0.001$) between alcohol price measures and indices of sales or consumption, with an aggregate-level price elasticity of demand of -0.17 for beer, -0.30 for wine, -0.29 for spirits and -0.44 for total alcohol. (Again, an elasticity of -0.44 means that a 10% increase in price results in a 4.4% decline in overall demand.) Notably, the analysis revealed that while raising the price of alcohol significantly reduces demand among heavy drinkers, the magnitude of effect is smaller than for lighter drinkers (mean reported elasticity of -0.28) (Wagenaar, Salois & Komro, 2009).[3]

Research from the Centre of Addictions Research of BC examined changes in British Columbia's minimum alcohol prices over a 20-year period to assess the effectiveness of this kind of intervention for reducing alcohol consumption (Stockwell et al., 2011). The authors estimate that a 10% increase in minimum price reduces consumption of spirits by 6.8%, wine by 8.9%, coolers and cider by 13.9%, beer by 1.5%, and all alcoholic drinks combined by 3.4%. This research represents the first empirical verification that minimum price policies reduce alcohol consumption at the population level.

---

[2] This analysis (as well as the information on specific price policies covered in Appendix A) focuses mainly on pricing policies set by each province's government liquor authority. There are other policies that affect alcohol prices, including bans on drink discounting (e.g., two-for-one drink specials, happy hour promotions), that many provinces use to control prices in licensed establishments. While these policies can and do have significant effects on risky alcohol consumption, they are not covered in detail in this report.

3 It is important to note that the elasticity estimates reported by Wagenaar and colleagues (one for aggregate consumption and one for heavy drinkers) are not directly comparable because the aggregate measure is based on population-level analyses and the estimate for heavy drinkers is based on individual-level analyses. For methodological reasons, the aggregate measure would be expected to be higher than the individual-level measure.

2.2 Price policies are effective for reducing alcohol-related harm

Numerous research studies from several countries show that price increases can help reduce alcohol-related harm at the population level. In particular, research demonstrates inverse relationships between prices and the following alcohol-related problems:

- Alcohol-related disease and injuries, violence, crime, traffic crashes and sexually transmitted diseases (Wagenaar, Tobler & Komro, 2010);
- Low birth weight (Zhang, 2010);
- Deaths from suicides, falls and motor vehicle accidents (Son & Topyan, 2010);
- Deaths from liver cirrhosis, alcohol poisoning (i.e., overdose), alcohol-related cancers, cardio-vascular diseases and others (Wagenaar, Maldonado-Molina & Wagenaar, 2009);
- Spousal abuse (Markowitz, 2000), child abuse (Markowitz & Grossman, 2000), suicide (Markowitz, Chatterji & Kaestner, 2003) and other forms of violence (Markowitz, 2005);
- Other health and social consequences, including non-fatal workplace accidents (Ohsfeldt & Morrisey, 1997), teenage pregnancy (Sen, 2003) and the incidence of sexually transmitted disease (Sen & Luong, 2008); and
- Fatal traffic accidents among youth and young adults (Chaloupka, Saffer & Grossman, 1993).

2.3 Indexing alcohol prices to inflation ensures prices do not decrease relative to other goods over time

As discussed in the second report in this series (Thomas, 2012b), it is important to consider the price of alcohol relative to other goods. If prices are not maintained vis-à-vis the consumer price index (CPI) the "real" price of alcohol will decrease, which could lead to an increase in consumption and harm over time (Babor et al., 2010). Statistics Canada data presented in the second report in this series show that, since the economic downturn of 2008, the prices of beer, wine and spirit products sold in liquor stores in Canada have not kept pace with inflation—and this may be encouraging consumption at the population level (Thomas, 2012a).

Within Canada, the province of Ontario is leading the way on the issue of price indexation policy. In 2010, the Ontario government passed legislation requiring its provincial liquor authority, the Liquor Control Board of Ontario (LCBO), to increase its minimum alcohol prices in line with the three-year average of the Ontario-specific CPI. Setting this policy in legislation means that annual CPI-based price increases must occur regardless of economic or political circumstances. Thus, the issue of indexation is removed from the administrative discretion of the LCBO. Among other things, this helps shield the LCBO from the backlash that often occurs when increases in alcohol prices are announced to the public.

2.4 Minimum price policies may be effective for reducing consumption among high-risk drinkers

Research from both the United States and the United Kingdom suggests that higher risk drinkers tend to purchase alcohol at a lower average price than low-risk drinkers. For example, the heaviest

10% of drinkers by volume in the United States reported spending USD $0.79 per standard drink. In comparison, the lowest 50% of drinkers reported spending USD $4.75 per standard drink (Kerr & Greenfield, 2007). Similar resulted were found in the United Kingdom, where high-risk drinkers reported spending the equivalent of CAD $0.87 per standard drink while low-risk drinkers reported spending an average of CAD $1.37 per standard drink (Meier et al., 2009).

When the price of alcohol goes up, drinkers may react by:

- Spending more on alcohol;
- Substituting cheaper products for more expensive products; or
- Reducing the amount of alcohol they buy.

In interpreting the implications of these findings for alcohol policy, one set of researchers wrote:

> In formulating policies to prevent alcohol problems… it may be more important to consider how such price changes would affect drinking by various consumers, such as heavy drinkers. Purchasers of higher quality beverages can respond to a price increase either by decreasing consumption of their typical brand or by switching to lower cost beverages. Those who are currently consuming the lowest cost brands do not have the latter option and might therefore be expected to curtail their ethanol consumption to a greater extent. If younger or heavier drinkers tend disproportionately to consume low-quality brands, price increases focusing on these low-cost beverages might be particularly useful for preventing alcohol problems among these groups (Gruenewald et al., 2006, p. 104).

Gruenewald and colleagues (2006) used 20 years of Swedish sales data to model the demand for all alcohol products and found that increasing the prices of the least expensive products (i.e., raising minimum prices) potentially had the largest effect on consumption. This was mainly because of the effects of minimum pricing on heavy drinkers who consume at the lower end of the price spectrum. In another relevant study, Ludbrook and colleagues (2012) used household expenditure data from the United Kingdom to investigate the potential effects of minimum prices on the consumption patterns of different types of drinkers. Their study verified that, among all drinkers, moderate (i.e., low-risk) drinkers were the least likely to purchase inexpensive alcohol. Their research also showed that consumers from lower socio-economic classes spent much less overall on alcohol than those from moderate and higher income classes, suggesting the effects of minimum pricing are less regressive at the population level than some have suggested.

Taken together, these economic theories and research findings strongly suggest minimum prices will affect higher risk drinkers from all social classes more than lower risk drinkers—effectively addressing the "punishing the many for the sins of a few" critique some detractors have levelled at minimum price policies for controlling risky alcohol consumption.

In summary, while direct evidence showing conclusively that minimum pricing reduces risky drinking at the population level does not exist, the findings discussed above strongly suggest minimum pricing will affect regular heavy drinkers more than moderate drinkers and therefore be more targeted than other types of pricing policies that affect all prices for alcohol (e.g., excise taxes).

2.5 Price policies could be tailored for specific types of harm

When considering specific options for effective alcohol price policies, it is also useful to take into account that different types of drinkers prefer different types of beverages, purchase them in different contexts, and experience different levels and types of alcohol-related harm.

As an example, Table 1 outlines the dominant drinking patterns across the drinking population of the United Kingdom as revealed by national survey data from 2006.

Table 1. Beverages of choice, sources of alcohol and principal harms, general population age 16+, United Kingdom, 2006

Group	Beverages of choice (% of consumption)	Sources of alcohol (% of consumption)	Principle harms
Males, 16–24	Beer (68%)	Licensed venues (76%)†	Alcohol-involved crime, acute health harm
Females, 16–24	Wine (29%), spirits (27%), coolers (23%)	Liquor stores (60%)†	Acute health harm
Hazardous-drinking males (all ages)[4]	Beer (53%), wine (33%)	Liquor stores (53%), licensed venues (47%)	Mix of acute and chronic health harm
Hazardous-drinking females (all ages)	Wine (66%)	Liquor stores (80%)	Mix of acute and chronic health harm
Harmful-drinking males (all ages)	Beer (63%)	Liquor stores (57%), licensed venues (43%)	Mix of acute and chronic health harm with chronic harm increasing with age
Harmful-drinking females (all ages)	Wine (62%)	Liquor stores (88%)	Mix of acute and chronic health harm with chronic harm increasing with age

Source: Meier et al., 2009; information on principal harm added by author.

† These percentages are for hazardous-drinking males and females ages 16–24.

Similarly, data from the 2000 National Alcohol Survey in the United States revealed distribution of drinking across the American population as shown in Table 2.

Table 2. Percent of total volume of alcohol consumed by heavy and light drinkers, United States, 2000

Alcohol type	Heaviest 10% of drinkers	Lightest 50% of drinkers
All alcohol	55.3%	5.5%
Beer	59.5%	4.1%
Wine	36.7%	9.3%
Spirits	62.9%	5.0%

Source: Kerr & Greenfield et al., 2006.

[4] The analysis conducted by Meier and colleagues defines "moderate drinkers" as those with an intake of alcohol less likely to damage health or be associated with negative consequences (i.e., less than 16 Canadian standard drinks per week for men and less than 10 standard drinks for women), "hazardous drinkers" as those with an increased risk of psychological (e.g., mood disturbances) and physical consequences (e.g., injuries) because of alcohol intake (i.e., 16–37 Canadian standard drinks per week for men and 10–26 standard drinks for women), and "harmful drinkers" as those with an intake that is likely to adversely affect health or have other negative consequences (i.e., more than 37 Canadian standard drinks per week for men and more than 26 Canadian standard drinks per week for women).

From these data it is evident that alcohol consumption by volume is concentrated among the top 10% of American drinkers who consume 55% of all alcohol (as measured by self-report). However, there are substantial differences in drinkers' preferences for different beverage types. For example, the top 10% of drinkers by volume consume approximately 60% of all beer and all spirits, while the bottom 50% of drinkers only drank 4.1% of beer and 5.0% of all spirits. Wine consumption is less skewed, with the top 10% of drinkers consuming 36.7% of wine and the bottom 50% consuming 9.3%. These data suggest heavy drinking may be more prevalent among beer and spirit drinkers than among wine drinkers.

Although the specifics of these data apply only to the general drinking populations of the United Kingdom and the United States, this level of detailed information for Canadian drinkers could inform the development of more effective price policies for addressing alcohol-related harm by helping to identify interventions that affect specific types of consumption and consumers. For example, because the majority of alcohol-related enforcement costs involve young adult and adult males (Meier et al., 2009; Thomas, 2004), reducing access to sources of inexpensive alcohol favoured by this group (e.g., low-cost beer) could help reduce enforcement costs by making it more difficult for younger male drinkers to engage in risky consumption.

2.6 Young adult drinkers are particularly price-sensitive[5]

As revealed in the first report in this series (Thomas, 2012a), regular heavy drinking is most common among young adults. For example, according to data from the 2010–11 Canadian Community Health Survey (CCHS), approximately half of all drinkers between the ages of 18 and 24 (52% of males and 45% of females) consumed alcohol in risky ways on a monthly or more frequent basis in the past year. Research also shows that young adult drinkers tend to be sensitive to alcohol price increases because of lower average disposable incomes (Meier et al., 2009; Chaloupka, Grossman & Saffer, 2002).

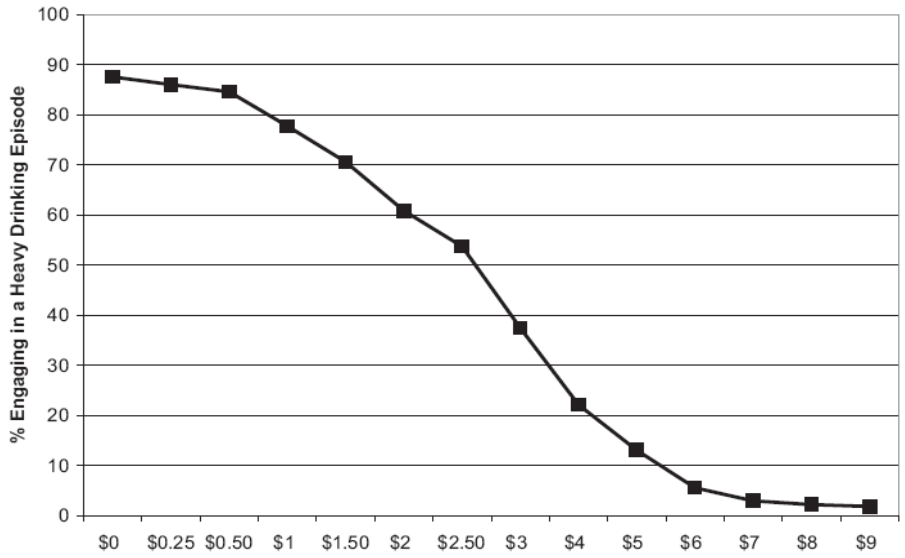
Given the high prevalence of risky drinking among young adults, it is important to consider the level at which minimum prices should be set to affect their consumption. Research in the United States by Murphy & MacKillop (2006) suggests that prices above USD $1.50 per standard drink begin to exert a significant downward influence on alcohol consumption by young adult drinkers:

> Demand for alcohol was initially inelastic (remained stable with increasing price) across low prices but became highly elastic (declined more rapidly) as price increased. Specifically, mean consumption was approximately seven drinks when price was $0.25 or less per drink and remained high (five or more drinks) at prices up to $1.50 per drink, then decreased linearly as price increased. Average consumption was less than 2.5 standard drinks when drink price was $4.00 and less than one standard drink at prices greater than $6.00. (Murphy & MacKillop, 2006, pp. 223–224)

[5] The focus on young adults here should not be taken to mean risky drinking is not also a problem among adult drinkers over the age of 25. Data from the 2009 and 2010 Canadian Alcohol and Other Drug Use Monitoring Surveys (CADUMS) reveals that a large majority of the heaviest consumption is accounted for by adults over the age of 25. Thus, while a larger *percentage* of young adults drink in risky ways, the fact that there are many more adults over the age of 25 engaging in risky drinking means they account for the vast majority (approximately 80–90%) of the heaviest drinking as measured by self-report. See Appendix C for more details.

The authors found that, on average, prices begin to have an effect on young adults' risky drinking (i.e., five or more drinks per occasion for men, four or more drinks per occasion for women) starting at USD $1.50 per standard drink, with the effects most pronounced above USD $2.50 per standard drink. By the time prices reached USD $5.00 per standard drink, the percentage of young adults who say they would engage in risky drinking falls to less than 15% from almost 90% who said they would consume in risky ways if the alcohol were free (Figure 1).

Figure 1. Percentage of young adults who self-reported they would engage in risky drinking as price per standard drink increases



Source: Murphy, J., & MacKillop, K. (2006). Relative reinforcing efficacy of alcohol among college student drinkers. *Experimental and Clinical Psychopharmacology*, *14*(2), 219–227. Published by the American Psychological Association; figure reprinted with permission.

Note: Horizontal axis shows prices per standard drink.

Although price appears to be a potentially effective way to control risky consumption among young adults, prices need to be set high enough to affect heavy consumption as well as be tailored to specific circumstances. For example, because the cost of alcohol is higher in licensed establishments, minimum prices in bars and clubs should be set higher than minimum prices in liquor stores. Also, the research of Murphy and MacKillop (2006) should be undertaken in Canada to determine appropriate pricing levels in both liquor stores and licensed establishments to reduce risky drinking among higher risk drinkers, including young adults.[6]

[6] One phenomenon that deserves mention here is "pre-drinking," a strategy used by many young adults to reduce their expenditures on alcohol. Young adults report consuming alcohol before going out to bars and clubs so that they need to drink less of the more expensive alcohol sold in licensed establishments. The key point here is that there are upper limits to how high alcohol prices can go before they create negative unintended consequences. Setting them too high will encourage more pre-drinking, which could create more harm if this drinking occurs in particularly risky ways. This is a topic worthy of more research, with the goal being to determine the mix of alcohol pricing for liquor stores and licensed establishments that will have the largest effect on risky drinking by young adults.

2.7 Pricing based on alcohol content can reduce consumption and harm

Pricing based on alcohol content so that higher strength beverages are more expensive than lower strength beverages creates price incentives for the production and consumption of safer, low-strength beverages within beverage classes (NASWG, 2007). Interestingly, research from Canada reveals that most drinkers cannot tell the difference between similar low-strength and high-strength beers in simulated group drinking situations. Further, they report enjoying social situations equally well and feeling equally intoxicated whether drinking low- or regular-strength beer—despite having significantly lower blood alcohol levels at the end of the night when drinking lower strength beer (Segal & Stockwell, 2009).

A relevant example is available from Australia. In the late 1980s, federal and state governments in Australia created tax incentives to encourage the production and sale of low- to mid-strength beers (i.e., 2.5–3.8% alcohol by volume). The market share of these beverages reached 40% of the total beer market in some jurisdictions by the late 1990s (Stockwell & Crosbie, 2001). These products are sold at large-scale sporting venues as a way of reducing problems with alcohol-related violence. The consumption of lower strength products can translate into lower blood alcohol levels as well as fewer alcohol-related safety problems (Stockwell et al., 1998).

When significant amounts of lower strength products are substituted for higher strength products in the market place, sales volumes can be maintained even though per capita alcohol consumption is reduced (NASWG, 2007). Thus, pricing on alcohol content provides another "win-win" policy option that simultaneously meets the goals of public finance, public health and public safety.

3. Discussion

3.1 Summary

Taken together, the above findings suggest three principles to inform the development of more effective alcohol price policies in Canada:

- Index alcohol prices to inflation to protect their real value over time (Babor et al, 2010).
- Base prices (including minimum prices) on alcohol content, creating price incentives for lower strength, less hazardous products and price disincentives for higher strength products (Stockwell et al., 1998).
- Focus on minimum prices rather than overall prices to remove the inexpensive sources of alcohol favoured by higher risk drinkers.

One potential approach that integrates all three of these pricing principles is to establish an effective minimum price per standard drink for different settings (e.g., bars, clubs, liquor stores), apply these prices per standard drink universally for all products, and adjust the minimum price with inflation at least annually.

A second complementary policy is to adjust alcohol mark-up schedules to create price incentives for lower strength alcohol products and disincentives for higher strength alcohol products within beverage categories. This policy would be less targeted than minimum prices but would contribute to reducing per capita alcohol intake, thereby facilitating reductions in alcohol-related harm and costs.

A third complementary policy is to adjust all alcohol prices at least annually to keep pace with inflation. Although this is the least targeted policy of all, it would ensure the price of alcohol does not erode relative to other goods in the marketplace. Adjusting prices with inflation will help curb risky consumption across the population and therefore address the relatively large number of people who engage in risky drinking on occasion.

Implemented together, these three complimentary policies have the potential to reduce consumption among both occasional and regular risky drinkers and thereby reduce alcohol-related harm and costs in Canada.

3.2 Implications for the Canadian context

After reviewing the available and emerging evidence, the National Alcohol Strategy Working Group (NASWG) included versions of these three pricing recommendations in Canada's first National Alcohol Strategy in 2007 (Stockwell, Leng & Sturge, 2006; NASWG, 2007). These policies potentially address both types of risky drinkers, occasional and regular. More specifically, indexing prices to inflation and pricing on alcohol content are well suited for addressing the relatively large number of people who occasionally drink in risky ways, while minimum pricing will be more effective for reducing consumption among regular heavy drinkers given that they tend to gravitate

toward inexpensive sources of alcohol (Thomas, 2012a).[7] In addition, the policies recommended in the National Alcohol Strategy have the potential to reduce alcohol-related harm and costs while simultaneously increasing government revenue from alcohol when mark-ups are based on price (Thomas, 2012b). In other words, implementing these price policies has the potential to create "wins" for public finance as well as public health and safety.[8]

Appendix A provides an assessment of alcohol price policies in six provincial jurisdictions based on the guiding principles set out above. This information shows that these provinces' alcohol pricing systems already incorporate many elements of the best and promising practices described in this report. For example, several jurisdictions increase prices on fortified wines to reflect their higher alcohol content and risk. However, no jurisdiction applies all three recommended policies (indexation, pricing based on alcohol content, minimum prices) systematically to create comprehensive incentives to reduce per capita alcohol consumption, harm and costs. The pricing practices shown in Table 3 stand out for reflecting the guiding principles set out above.

Table 3. Canadian provinces utilizing recommended price policies for addressing alcohol-related harms

Jurisdiction	Policy or practice
New Brunswick	Maintaining higher minimum prices for alcohol Setting minimum prices for licensed establishments
Ontario	Mandating in legislation the annual indexing of minimum prices to the three-year average of the Ontario Consumer Price Index Minimum prices based on alcohol content for high-strength products Setting minimum prices for licensed establishments
Saskatchewan	Increase minimum prices and setting them based on alcohol content to create a more uniform price per standard drink within beverage classes Setting minimum prices for licensed establishments
Alberta	Prohibiting drink discounting in licensed establishments after 8 p.m. Implementing a surcharge on high-strength beers to discourage overconsumption Setting minimum prices for licensed establishments

Source: Compiled by author.

[7] While the price policies described in this report have the potential to reduce alcohol consumption and its associated harm among the general population, raising the minimum price of alcohol will also seriously affect the ability of highly marginalized groups to obtain cheap alcohol. It is recommended, therefore, that when such policies are put in place additional resources also be directed toward alcohol prevention, treatment and harm reduction services for highly marginalized populations such as the homeless, aboriginals and others. Such services should include managed alcohol programs that provide measured doses of alcohol to chronic street inebriates in managed residential settings. Research from Canada shows that these programs can improve the health of highly marginalized individuals and potentially reduce health and social costs associated with their dependence on alcohol (Podymow et al., 2006).

[8] Recent experiences in Saskatchewan verify that the policies recommended in the National Alcohol Strategy have the ability to simultaneously reduce per capita alcohol consumption and increase government revenue. In fiscal year 2010–11, Saskatchewan reduced alcohol consumption by 135,000 litres of pure ethanol and increased revenue by more than $9 million (Saskatchewan Liquor and Gaming Authority, 2011). While most of the increase in revenue came from increased mark-ups (i.e., taxes) on beer, some of it was the result of increases in minimum prices on spirit products and the implementation of new minimum prices on coolers.

4. Conclusion

This report summarizes the existing and emerging evidence suggesting that indexing prices to inflation, pricing based on alcohol content and setting minimum prices for alcohol are effective for reducing risky consumption at the popuation level. These recommended policies are compared with pricing practices across six jurisdictions (British Columbia, Alberta, Saskatchewan, Ontario, Quebec and New Brunswick) that together comprise over 90% of the Canadian population (Appendix A). This comparison provides an overview of the status of pricing pratices to generate baseline information to inform efforts to enhance alcohol pricing policies in these jurisdictions.

Three options for integrating all three pricing principles are as follows:

1. Establish an effective minimum price per standard drink for different settings (e.g., bars, clubs, liquor stores), apply these prices universally for all products, and adjust the minimum price with inflation at least annually;
2. Adjust alcohol mark-up schedules (i.e., taxes) to create price incentives for lower strength alcohol products and disincentives for higher strength alcohol products within beverage categories; and
3. Adjust alcohol prices at least annually to keep pace with inflation.

Implemented together, these three policies have the potential to reduce consumption among both occasional and regular risky drinkers and thereby substantially reduce alcohol-related harm and costs in Canada. These policies also have the added benefit of generating substantial revenue for governments when mark-ups are based on price, potentially creating "wins" for public health and public finance simultaneously.

Therefore, governments across Canada are urged to:

- Review existing policies in light of the pricing policies recommended in this report and the National Alcohol Strategy;
- Include a public health and safety perspective in the development of alcohol policy; and
- Conduct and share research and evaluations related to alcohol prices and the impact of alcohol pricing policies.

References

Babor, T., Caetano, R., Casswell, S., Edwards, G., Giesbrecht, N., Graham, K., et al. (2010). *Alcohol: No ordinary commodity* (2nd ed.). New York: Oxford University Press.

Chaloupka, F., Grossman, J., & Saffer, H. (2002). The effects of price on alcohol consumption and alcohol-related problems. *Alcohol Research and Health*, *26*(1), 22–34.

Cook, P. (2008). A free lunch. *Journal of Drug Policy Analysis*, *1*(1), Article 2. Retrieved from http://www.bepress.com/jdpa/vol1/iss1/art2.

Gruenewald, P., Ponicki, W., Holder, H., & Romelsjo, A. (2006). Alcohol prices, beverage quality, and the demand for alcohol: Quality substitutions and price elasticities. *Alcoholism: Clinical and Experimental Research*, *30*(1), 96–105.

Kerr, W., & Greenfield, T. (2007). Distribution of alcohol consumption and expenditures and the impact of improved measurement on coverage of alcohol sales in the 2000 National Alcohol Survey. *Alcohol: Clinical and Experimental Research*, *31*(10), 1714–1722.

Ludbrook, A., Petrie, D., McKenzie, L., & Farrar, S. (2012). Tackling alcohol misuse: Purchasing patterns affected by minimum pricing for alcohol. *Applied health Economics and Health Policy*, *10*(1), 51–63.

Markowitz, S. (2005). Alcohol, drugs, and violent crime. *International Review of Law and Economics*, *25*(1), 20–44.

Markowitz, S. (2000). The price of alcohol, wife abuse, and husband abuse. *Southern Economic Journal*, *67*(2), 279–303.

Markowitz, S., Chatterji, P., & Kaestner, R. (2003). Estimating the impact of alcohol policies on youth suicides. *Journal of Mental Health Policy and Economics*, *6*(1), 37–46.

Markowitz, S., & Grossman, M. (2000). The effects of beer taxes on physical child abuse. *Journal of Health Economics*, *19*(2), 271–282.

Meier, P., Purshouse, R., & Brennan, A. (2009). Policy options for alcohol price regulation: The importance of modelling population heterogeneity. *Addiction*, *105*(3), 383–393.

Murphy, J., & MacKillop, K. (2006). Relative reinforcing efficacy of alcohol among college student drinkers. *Experimental and Clinical Psychopharmacology*, *14*(2), 219–227.

National Alcohol Strategy Working Group. (2007). *Toward a culture of moderation: Recommendations for a national alcohol strategy*. Retrieved from http://www.nationalframework-cadrenational.ca/uploads/files/FINAL_NAS_EN_April3_07.pdf.

Ohsfeldt, R., & Morrisey, M. (1997). Beer taxes, workers compensation, and industrial injury. *Review of Economic Statistics*, *79*, 155–160.

Podymow, T., Turnbull, J., Coyle, D., Yetisir, E., & Wells, G. (2006). Shelter based managed alcohol administration to chronically homeless people addicted to alcohol. *Canadian Medical Association Journal*, *174*(1), 45–49.

Purshouse, R., Meier, P., Brennan, A., Taylor, K., & Rafia, R. (2010). Estimated effect of alcohol pricing policies on health epidemiological model. *Lancet*, *375*(9723), 1355–1364.

Saskatchewan Liquor & Gaming Authority. (2011). *Annual report, 2010–11*. Retrieved from http://www.slga.gov.sk.ca/Prebuilt/Public/SLGA%20Annual%202011.pdf.

Segal, D., & Stockwell, T. (2009). Low alcohol alternatives: A promising strategy for reducing alcohol related harm. *International Journal of Drug Policy*, *20*(2), 183–187.

Sen, B. (2003). Can beer taxes affect teen pregnancy? Evidence based on teen abortion rates and birth rates. *Southern Economic Journal*, *70*, 505–517.

Sen, B., & Luong, M. (2008). Estimating the impact of beer prices on the incidence of sexually transmitted diseases: Cross-province and time series evidence from Canada. *Contemporary Economic Policy*, *26*, 328–343.

Son, C., & Topyan, K. (2010). The effects of alcoholic beverage excise tax on alcohol-attributable injury mortality. *European Journal of Health Economics*, *12*, 103–113.

Stockwell, T., Auld, C., Zhao, J., & Martin, G. (2011). Does minimum pricing reduce alcohol consumption? The experience of a Canadian province. *Addiction*, *107*(5), 912–920. doi: 10.1111/j.1360-0443.2011.03763.x

Stockwell, T., & Crosbie, D. (2001). Supply and demand for alcohol in Australia: Relationships between industry structures, regulation and the marketplace. *International Journal of Drug Policy*, *12*(2), 139–152.

Stockwell, T., Leng, J., & Sturge, J. (2006) *Alcohol pricing and public health in Canada: Issues and opportunities*. Victoria, BC: Centre for Addictions Research of BC. Discussion paper prepared for the National Alcohol Strategy Working Group, Vancouver.

Stockwell, T., Masters, L., Philips, M., Daly, M., Gahegan, M., Midford, R., et al. (1998). Consumption of different alcoholic beverages as predictors of local rates of night-time assault and acute alcohol-related morbidity. *Australian and New Zealand Journal of Public Health*, *22*(2), 237–242.

Stockwell, T., Zhao, J., Macdonald, S., Pakula, B., Gruenewald, P., & Holder, H. (2009). Changes in per capita alcohol sales during the partial privatization of British Columbia's retail alcohol monopoly 2003–2008: A multi-level local area analysis. *Addiction*, *104*(11), 1827–1836.

Stockwell, T., Zhao, J., & Thomas, G. (2009). Should alcohol policies aim to reduce total alcohol consumption? New analyses of Canadian drinking patterns. *Addiction Research and Theory*, *17*(2), 135–151.

Thomas, M. (2004). Adult criminal court statistics, 2003–04. *Juristat*, *24*(12). Ottawa: Statistics Canada. Retrieved from http://www.statcan.gc.ca/pub/85-002-x/85-002-x2004012-eng.pdf.

Thomas, G. (2012a). *Levels and patterns of alcohol use in Canada.* Ottawa: Canadian Centre on Substance Abuse.

Thomas, G. (2012b). *Analysis of beverage alcohol sales in Canada.* Ottawa: Canadian Centre on Substance Abuse.

Thomas, G. (2012c). Saskatchewan's alcohol price policies reduce consumption. *CCSA Action News*. Ottawa: Canadian Centre on Substance Abuse.

Thomas, G., & Davis, C. (2009). Cannabis, tobacco and alcohol use in Canada: Comparing risks of harm and costs to society. *Visions*, *5*(4), 11–13.

Toumbourou, J.W., Stockwell, T., Neighbors, C., Marlatt, G.A., Sturge, J., & Rehm, J. (2007). Interventions to reduce harm associated with adolescent substance use: An international review. *Lancet*, Adolescent Health Series No. 4, 41–51.

Verbaten, M. (2009). Chronic effects of low to moderate alcohol consumption on structural and functional properties of the brain: Beneficial or not? *Human Psychopharmacology: Clinical and Experimental*, *24*(3), 199–205.

Wagenaar, A., Maldonado-Molina, M., & Wagenaar, B. (2009). Effects of alcohol tax increases on alcohol-related disease mortality in Alaska: Time-series analyses from 1976 to 2004. *American Journal of Public Health*, *99*. Retrieved from http://www.ajph.org/cgi/reprint/AJPH.2007.131326v1.

Wagenaar, A., Tobler, A., & Komro, K. (2010). Effects of alcohol tax and price policies on morbidity and mortality: A systematic review. *American Journal of Public Health*, *100*(11), 2270–2278. Retrieved from http://ajph.aphapublications.org/cgi/content/abstract/AJPH.2009.186007v1.

Wagenaar, A., Salois, M., & Komro, K. (2009). Effects of beverage alcohol price and tax levels on drinking: A meta-analysis of 1003 estimates from 112 studies. *Addiction*, *104*(2), 179–190.

Yukon Bureau of Statistics. (2000). *Alcohol sales in the Yukon*. Retrieved from http://www.eco.gov.yk.ca/pdf/alcohol.pdf.

Zhang, N. (2010). Alcohol taxes and birth outcomes. *International Journal of Environmental Research and Public Health*, *7*(5), 1901–1912.

Appendix A: Overview of Contextual Factors and Alcohol Pricing Policies in Select Jurisdictions, December 2010

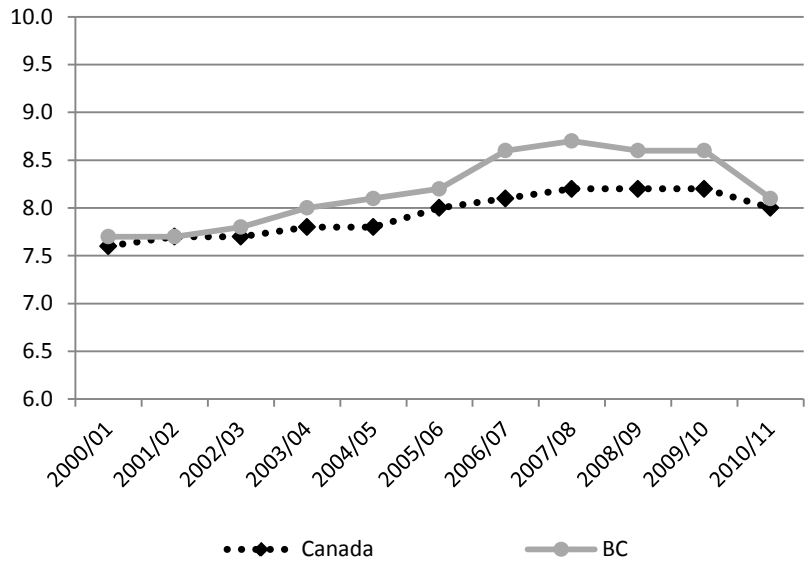
This appendix provides an overview of the status of pricing policies in six provinces to generate a baseline in relation to the guiding principles for alcohol pricing set out in this report. Collected at the end of 2010, this information allows for the comparison of policies across the six provinces that together comprise over 90% of the Canadian population: British Columbia, Alberta, Saskatchewan, Ontario, Quebec and New Brunswick.

British Columbia

Alcohol consumption

Per capita alcohol consumption in British Columbia is above the national average and, until recently, was increasing at a faster rate than the rest of Canada.[9] From 1999–00 to 2010–11, overall consumption increased from 7.6 litres of absolute alcohol per person to 8.1 litres, peaking at 8.7 litres in 2007–08. The province's level of consumption for 2010–11 (8.1 litres) is equivalent to 475 drinks (e.g., bottles of beer, glasses of wine or cocktails) per year for every person age 15 years and older.

Figure A1. Per capita alcohol consumption in litres of pure alcohol, age 15+, British Columbia and Canada, 1999–00 to 2010–11



Source: Statistics Canada.

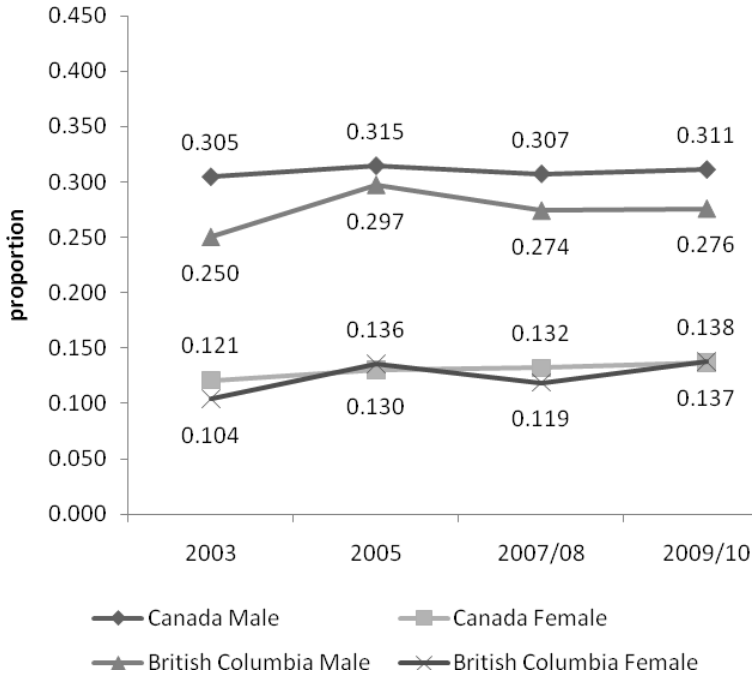
[9] Research by Stockwell and colleagues (2009) suggests the policies that allowed for the rapid expansion of private liquor stores in British Columbia after 2002 have likely contributed to the increase in per capita consumption in the province.

Trends in risky drinking

The Canadian Community Health Survey (CCHS) identifies drinkers who consumed more than five drinks on a single occasion once a month or more in the past year as "risky drinkers". Figure A2 depicts trends in monthly risky drinking for males and females in British Columbia from 2003 to 2009–10. The five-plus drinks per occasion measure is used here for both men and women so that statistical significance can be reported.

In all years, rates of monthly risky drinking for males in British Columbia were significantly lower than the Canadian average. Risky drinking for women was significantly lower than the Canadian average in 2003, however, monthly risky drinking by women increased over time such that it was statisically equivalent to the Canadian average in 2009–10. Rates of risky drinking for both men and women in British Columbia increased significantly between 2003 and 2009–10 ($p < 0.05$).

Figure A2. Trends in self-reporting monthly risky drinking (5+ drinks/occasion), current (past year) drinkers, general household population age 15+, British Columbia



Sources: Canadian Community Health Survey; Statistics Canada.

Notes: These data use five or more drinks on a single occasion once a month or more to identify women who engage in risky drinking so that statistical significance can be reported. Rates would be approximately 70% higher if four or more drinks on a single occasion were used as the measure. These data underestimate the true extent of risky drinking because of the under reporting endemic to self-reported drinking measures.

Revenue-cost analysis

A comparison of the direct government revenue and costs from alcohol in British Columbia in 2002–03 revealed that the province had a deficit of $73.8 million ($17.83 per capita). Looking more closely at per capita health and enforcement costs, British Columbia is above the national average for alcohol-related healthcare costs ($133 per capita compared to $105 per capita for all of Canada) and below the national average for alcohol-related enforcement costs ($87 per capita compared to $98 per capita for all of Canada).

Minimum price regulations

Table A1 depicts British Columbia's current system of minimum prices converted to standard drinks for beverages of typical alcohol content.

Table A1. Minimum prices per standard unit of alcohol for products of typical alcohol content sold in government liquor stores, BC, July 2010

Product	Minimum price (includes 12% sales tax)	Typical alcohol content	Typical product volume	Minimum price per standard unit of alcohol for beverages with typical alcohol content[10]	Lowest retail price per standard unit of alcohol for non-discounted products[11]
Beer (packaged)	$3.54/litre	5%	341 mL	$1.21	$0.77
Beer (draught)	$2.22/litre	5%	varies	$0.76	n/a
Coolers and cider	$3.00/litre	7%	330 mL	$0.73	$0.71
Wine (less than 10 L)	$7.20/litre	12.5%	750 mL	$0.98	$0.62
Wine (greater than 10 L)	$6.45/litre	12.5%	varies	$0.88	n/a
Spirits	$31.66/litre	40%	750 mL	$1.35	$1.01

Source: BC Liquor Distribution Branch; information on file with author.

Note: In Canada, a standard unit of alcohol is 17.05 mL (13.45g) of ethyl alcohol.

It is important to acknowledge that while British Columbia has minimum retail prices for beer, wine and spirits, these prices do not take alcohol content into account. This makes it impossible to set a minimum price per standard unit of alcohol and allows for inexpensive sources of alcohol to emerge from the price system. For example, the current minimum price of spirits is $31.66/litre. For a typical 80 proof (40% alcohol) 750 ml spirit product, this translates into $1.35 per standard drink (including 12% sales tax). However, a 750 ml bottle of 151 proof (75.5% alcohol) rum currently retails for $34.99 including sales tax. This is equivalent to $1.18 per standard drink. As this example shows, setting minimum prices based on beverage type and product volume alone does not guarantee an enforceable minimum price per standard unit of alcohol. Indeed, there is a high-strength beer available in British Columbia that delivers a standard drink for $0.77.[12] This is substantially below the price identified as potentially affecting the consumption of heavy drinking young adults in the United States (Murphy & MacKillop, 2006).

Price indexing

British Columbia has reviewed its prices annually since 2005. However, unlike Quebec and Ontario, the province does not automatically adjust its minimum prices for inflation. As such, price adjustments in British Columbia are under the administrative discretion of the BC Liquor

[10] Typical alcohol content is assumed to be 5% for beer, 7% for coolers/cider, 12.5% for wine and 40% for spirits.

11 Policies in most jurisdictions allow government liquor authorities to sell discontinued products at prices well below published minimums to clear them from shelves more quickly. The prices listed in this column do not include discontinued products; therefore, actual lowest prices are below those shown here.

12 See http://www.bcliquorstores.com/product/50401 for product details.

Distribution Branch and therefore may not be effective for guarding against a decrease in the cost of alcohol relative to other commodities over time.

Price incentives for lower alcohol content beverages

British Columbia's current mark-up schedule includes a minor price break of $0.50 per dozen coolers with alcohol content between 3.1% and 4.0%, and a price break of $1.00 per dozen coolers with alcohol content from 1.1% and 3.0%. The province's pricing schedule also includes slightly higher mark-ups for higher strength fortified wines relative to regular strength table wines (142% mark-up vs. 123% mark-up for table wines). However, this difference is not high enough to maintain a constant cost per standard unit of alcohol across wine products. For example, although the minimum price for 12% alcohol wines is $1.14 for products less than 10 L in size, there is a fortified wine available in British Columbia that delivers a standard drink for $0.69.[13]

Other issues

Alcohol is available in British Columbia through both government and private outlets (i.e., a mixed system) with private retailers now accounting for approximately 45% of sales (Kendall, 2008). This complicates pricing matters significantly because minimum price regulations only apply to government-run stores. To increase their profit margins, private liquor stores in British Columbia are allowed to price alcohol up to 16% below the minimum prices applied in stores run by the BC Liquor Distribution Branch. However, the government does have one policy lever available to it that can influence prices in private stores: regulations for minimum mark-ups. Through minimum mark-ups, the BC Liquor Distribution Branch can influence the wholesale cost to private retailers, creating incentives for them to increase or maintain their retail prices. However, British Columbia has not updated its minimum mark-ups since 1998; therefore, they are currently not providing effective incentives to private retailers to match minimum prices set in government stores.

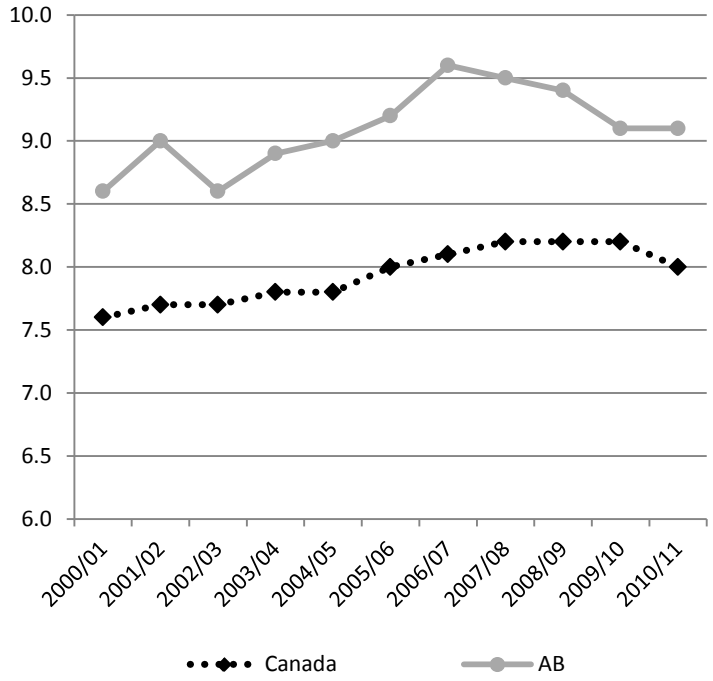
Alberta

Alcohol consumption

As illustrated in Figure A3 below, per capita alcohol consumption in Alberta has been substantially above the national average for the last decade. Between 1999–00 and 2010–11, consumption increased from 8.6 litres of absolute alcohol per person age 15+ to 9.1 litres per person, peaking at 9.6 litres per capita in 2006–07. The level of consumption for 2010–11 is almost 14% higher than the average for all of Canada and is equivalent to 533 standard drinks per year for every person in the province age 15 years and older.

[13] See http://www.bcliquorstores.com/product/7831 for product details.

Figure A3. Per capita alcohol consumption in litres of pure alcohol, Alberta and Canada, 1999–00 to 2010–11

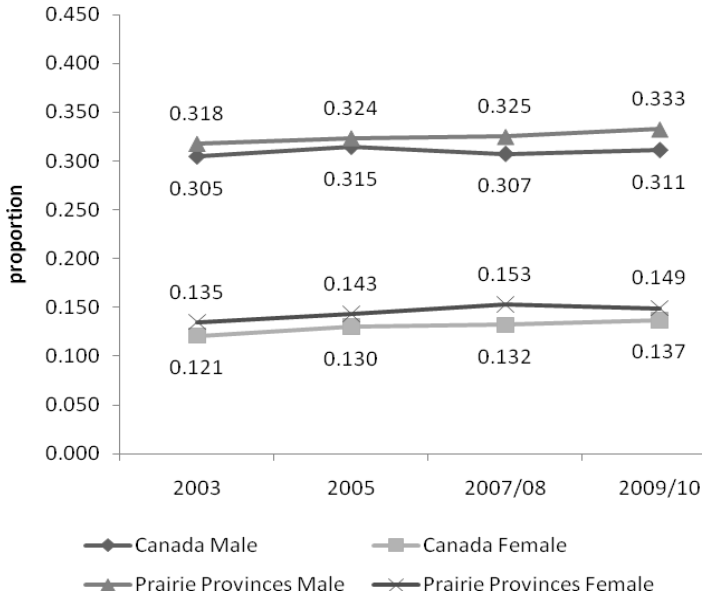


Source: Statistics Canada

Trends in risky drinking

Figure A4 shows trends in risky drinking for men and women in Alberta, Saskatchewan and Manitoba between 2003 and 2009–10 using the measure of five or more drinks on a single occasion once a month or more in the past year. For all years, the rates of self-reported monthly risky drinking in the Prairie provinces was statistically significantly higher than the average for all of Canada. Rates of risky drinking were statistically significantly higher for women in 2009–10 compared to 2003, while rates for men were not statistically significantly different.

Figure A4. Trends in self-reporting monthly risky drinking (5+ drinks/occasion), current (past year) drinkers, general household population age 15+, Prairie provinces (Alberta, Saskatchewan, Manitoba)



Sources: Canadian Community Health Survey; Statistics Canada.

Notes: These data use five or more drinks on a single occasion once a month or more to identify women who engage in risky drinking so that statistical significance can be reported. Rates would be approximately 70% higher if four or more drinks on a single occasion were used as the measure. These data underestimate the true extent of risky drinking because of the under reporting endemic to self-reported drinking measures.

Revenue-cost analysis

A comparison of the direct revenue and costs from alcohol in Alberta shows that the province had an overall deficit of $152.5 million (or $48.97 per capita) in 2002–03. In terms of specific per capita costs, Alberta is above the national average for alcohol-related healthcare costs ($130.67 per capita compared to $105.25 per capita for all of Canada) and below the national average for alcohol-related enforcement costs ($88.36 per capita compared to $98.08 per capita for all of Canada).

Minimum price regulations

Alberta does not currently have minimum retail prices for alcohol sold in liquor stores but does have minimum prices for drinks sold in licensed establishments (i.e., bars, clubs and restaurants). Since August 2008, minimum prices for alcohol sold in licensed establishments are as follows:

Table A2. Minimum prices per standard unit of alcohol for products sold in licensed establishments, Alberta, June 2010

Product	Minimum price for licensed establishments	Typical alcohol content	Typical product volume	Minimum price per standard drink for beverages with typical alcohol content
Beer, cider or coolers in cans or bottles	$2.75/12 oz. bottle or can	5% for beer, 7% for cider and coolers	341 mL for beer, 330 mL for cider and coolers	$2.75 for beer, $2.04 for cider and coolers
Draught beer	$0.16/oz. ($3.20/20 oz. pint)	5%	591 mL (20 oz. pint)	$1.85
Wine	$0.35/oz. ($1.75/5 oz. glass)	12.5%	148 mL (5 oz.)	$1.61
Spirits and liqueurs	$2.75	40%	44.4 mL (1.5 oz.)	$2.64

Source: Alberta Gaming and Liquor Commission (http://www.aglc.gov.ab.ca/liquor/faq.asp#MinDrinkPrice).

In addition to these minimum prices for alcohol sold in licensed establishments, Alberta also prohibits discount pricing of liquor (e.g., happy hour promotions) after 8:00 p.m., and limits the number of drinks that can be sold after 1:00 a.m. to two per patron to control heavy drinking at closing time.

Price indexing

Alberta does not automatically index its minimum prices to inflation. The Alberta Gaming and Liquor Commission (AGLC) reviews its minimum price policies for licensed establishments on an ad hoc basis as per its standard policy review processes. This means price adjustments are under the administrative discretion of the AGLC rather than being mandated.

Price incentives for lower alcohol content beverages

The AGLC adjusts its mark-ups for spirits, coolers/ciders and wine/sake based on alcohol content, a practice that can potentially contribute to the creation of price incentives for lower strength products and price disincentives for higher strength products. For example, spirit products above 60% alcohol content attract a mark-up of $17.87 per litre, spirit products between 22% and 60% alcohol content receive a mark-up of $13.30 per litre, and spirit products with less than or equal to 22% alcohol content are marked up by $9.90 per litre. In addition, the mark-up for refreshment beverages (e.g., coolers, ciders) between 8% and 16% alcohol is $4.05 per litre, while the mark-up for refreshment beverages less than 8% alcohol is $1.35 per litre.

In December 2010, the AGLC increased its mark-ups on beers with alcohol content greater than 11.9% by volume. As the federal government taxes beers above 11.9% alcohol content as "imitation spirits", the AGLC used the same threshold for its new beer pricing policy. The mark-ups for high-strength beers in Alberta are as shown in Table A3.

Table A3. Mark-ups for high-strength beer, Alberta, December 2010

Alcohol content	Mark-up per litre
Greater than 11.9% but less than or equal to 16%	$4.05/litre of beverage
Greater than 16% but less than or equal to 22%	$9.90/litre of beverage
Greater than 22% but less than or equal to 60%	$13.30/litre of beverage

Source: Alberta Gaming and Liquor Commission (http://aglc.ca/pdf/news/IB-HighAlcoholBeer20101202.pdf).

The potential health and safety impacts of Alberta's volumetric price structure are likely reduced, however, because:

- Retail alcohol sales are completely privatized in Alberta, which makes enforcement more difficult;
- The vast majority of the cooler market is made up of drinks between 6% and 7% alcohol, meaning the mark-up adjustment at 8% alcohol does little to influence consumers to substitute lower alcohol content beverages; and
- There is no volumetric pricing for beer products with alcohol content lower than 11.9%.

Other issues

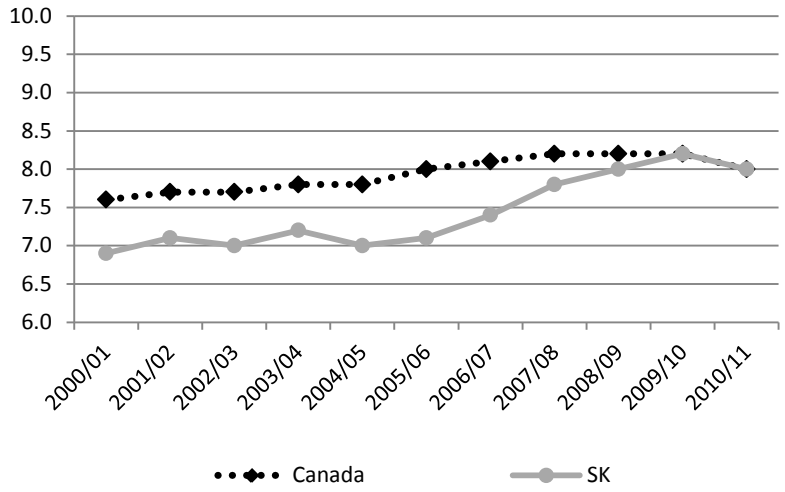
Alberta is the only jurisdiction in Canada that has totally privatized the retail sale of alcohol. As such, managing prices to enhance health and safety outcomes is much more difficult than it would be in other provinces where the majority of alcohol sales still occur through government-operated outlets. Among other things, this may explain why Alberta does not currently have minimum prices for alcohol sold in liquor stores and may contribute to the higher average per capita consumption in the province.

Saskatchewan

Alcohol consumption

For the last decade, Saskatchewan has been consistently below the national average for per capita alcohol consumption. However, consumption has grown more quickly than the national rate over the last four reporting periods, resulting in a narrowing of the gap between consumption levels (Figure A5). Between 1999–00 and 2010–11, alcohol consumption increased from 6.8 litres of absolute alcohol per person to 8.0 litres, peaking at 8.1 litres in 2009–10. The province's level of consumption for 2010–11 (8.0 litres) is equivalent to 469 standard drinks per year for every person age 15 year and older.

Figure A5. Per capita alcohol consumption in litres of pure alcohol, age 15+, Saskatchewan and Canada, 1999–00 to 2010–11

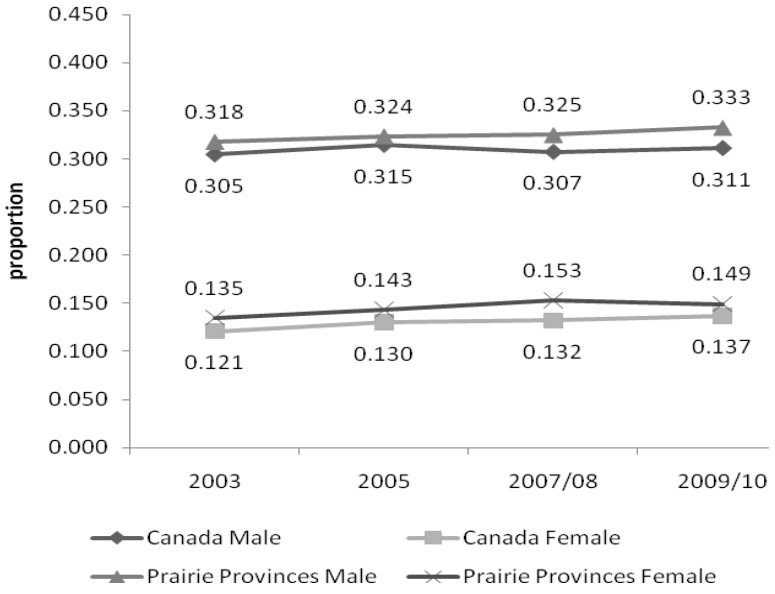


Source: Statistics Canada.

Trends in Risky Drinking

Figure A6 shows trends in risky drinking for men and women in Alberta, Manitoba and Saskatchewan between 2003 and 2009 using the measure of five or more drinks on a single occasion once a month or more in the past year. For all years, rates of self-reported monthly risky drinking for males and females age 15+ in the Prairie provinces was statistically significantly higher than the average for all of Canada. In terms of trends, rates of risky drinking were statistically significantly higher for women in 2009–10 compared to 2003, while rates for men were not statistically significantly different.

Figure A6. Trends in self-reporting monthly risky drinking (5+ drinks/occasion), current (past year) drinkers, general household population age 15+, Prairie provinces (Alberta, Saskatchewan, Manitoba)



Sources: Canadian Community Health Survey; Statistics Canada.

Notes: These data use five or more drinks on a single occasion once a month or more to identify women who engage in risky drinking so that statistical significance can be reported. Rates would be an estimated 70% higher if four or more drinks on a single occasion were used as the measure. These data underestimate the true extent of risky drinking because of the under reporting endemic to self-reported drinking measures.

Revenue-cost analysis

A comparison of the direct revenue and costs from alcohol in Saskatchewan revealed that the province had an overall deficit of $20.6 million (or $20.40 per capita) in 2002–03. In terms of specific per capita costs, Saskatchewan is above the national average for alcohol-related healthcare costs ($116.84 per capita compared to $105.25 per capita for all of Canada) and slightly above the national average for alcohol-related enforcement costs ($99.45 per capita compared to $98.08 per capita for all of Canada).

Minimum price regulations

In April 2010, Saskatchewan implemented new minimum price policies based on percentage bands of alcohol content and package sizes.[14] Although not perfectly volumetric, this new pricing system—the first of its kind in Canada—will generate a more uniform price per standard drink within beverage classes. Saskatchewan's minimum price policies do not apply to the approximately 440 private retailers in the province. The effective minimum price per standard drink for products with typical alcohol strength and volume are depicted in Table A4.

Table A4. Minimum prices per standard unit of alcohol for products of typical alcohol content and product volume sold in government liquor stores, Saskatchewan, June 2010

Product	Typical alcohol content	Typical product volume	Minimum price per standard unit of alcohol (including sales taxes) for beverages with typical alcohol content	Lowest retail price per standard unit of alcohol for non-discounted products
Beer	5%	341 mL	$1.49	$1.14
Coolers and cider	7%	330 mL	$1.25	$1.19
Wine	12.5%	750 mL	$1.42	$1.07
Spirits	40%	750 mL	$1.35	$1.20

Source: Saskatchewan Liquor and Gaming Authority; information on file with author.

Price indexing

Although Saskatchewan reviews its prices annually, it does not automatically adjust them for inflation as is the case in Ontario and Quebec. Thus, cost of living adjustments fall under the administrative discretion of the Saskatchewan Liquor and Gaming Authority, which may not choose to increase prices with inflation if circumstances are deemed economically unfavourable for price increases.

Price incentives for lower alcohol content beverages

In addition to creating price incentives for lower strength products and price disincentives for higher strength products by structuring its minimum prices based on narrow percentage bands of alcohol content, Saskatchewan adjusts its regular mark-up schedule according to alcohol content for some alcohol products. For example, table, sparkling and fruit wines less than 15.9% alcohol are marked up by 121%, while standard (i.e., non-premium) ports, sherries and fortified fruit wines attract a mark-up of 184%. Similarly, cocktails and after-dinner drinks between 7.1% and 13.7% alcohol are marked up by 135%, while those above 13.7% alcohol content receive a mark-up of 162%. In addition, a high alcohol content surcharge applies a flat rate per litre of pure alcohol (LPA) on all packaged beer with alcohol content greater than 6.5%. For example, if the beer product has an alcohol content of 8%, the surcharge applies to the 1.5% differential. This policy does not apply to

[14] The liquor authorities generally use bands of alcohol strength to set prices of products. For example, they could set prices so that products with alcohol content from 6–8% will have a minimum price of $1.50. However, an 8% beer has more alcohol than a 6% beer even though it has the same minimum price. When looked at in terms of standard drinks, the 8% beer delivers a standard drink for less than the 6% beer sold at the same price. The wider the bands of alcohol strength used in the pricing system, the greater the variation in price per standard drink within the band. Saskatchewan recently dealt with this issue by setting its prices based on narrower bands of alcohol strength, creating more uniform minimum prices per standard drink within beverage classes.

draught keg products. The surcharge rate is equal to $40 per LPA under the current flat rate mark-up structure. For example, the surcharge on a 1.18 L bottle of beer with 8% alcohol content is calculated as 1.18 L x (8.0% – 6.5%) x $40 per LPA, or $0.708.

Other issues

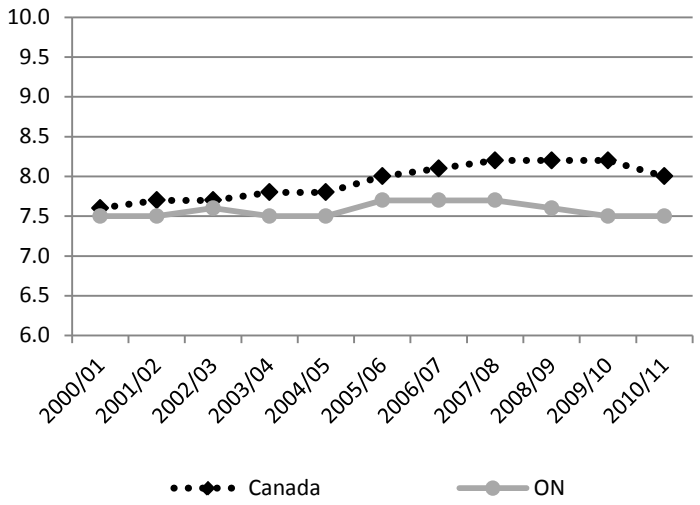
Saskatchewan licenses approximately 440 privately operated hotels across the province to sell beer, wine, spirits and coolers for off-premise consumption. These private businesses get a small wholesale price break from the liquor authority to increase their profit margin and are not required to honour the minimum retail prices applied to alcohol sold from government run liquor stores. These private hotel outlets account for a substantial proportion of alcohol sales in the province, especially for beer. This means that a non-trivial proportion of alcohol sold in Saskatchewan is sold for less than the minimum prices listed in Table A4.

Ontario

Alcohol consumption

Alcohol consumption in Ontario has been below the national average since 1999–00. From 1999–00 to 2010–11, per capita consumption remained at 7.5 litres of absolute alcohol per person, peaking at 7.7 litres per capita from 2005–06 to 2007–08 (Figure A7). The province's level of consumption for 2010–11 (7.5 litres) is equivalent to 440 standard drinks per year for every person age 15 years and older.

Figure A7. Per capita alcohol consumption in litres of pure alcohol, age 15+, Ontario and Canada, 1999–00 to 2010–11



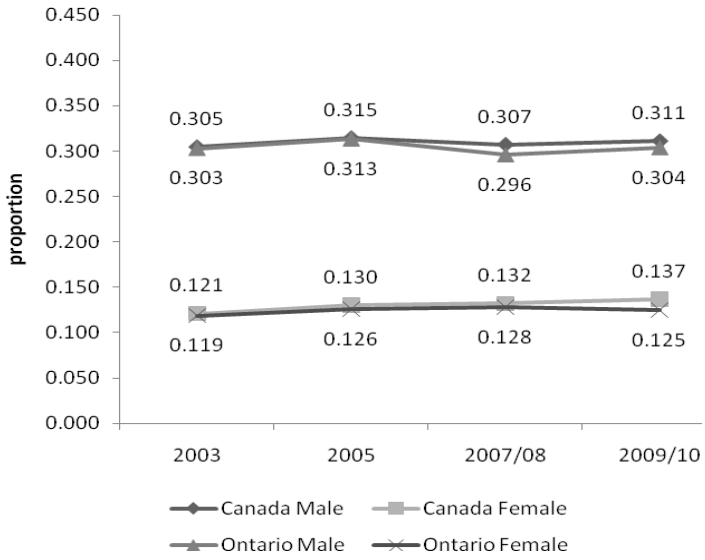
Source: Statistics Canada.

Trends in risky drinking

Figure A8 shows trends in risky drinking for men and women in Ontario between 2003 and 2009–10 using the measure of five or more drinks on a single occasion once a month or more in the past year. Rates of self-reported monthly risky drinking by men age 15+ in Ontario were significantly ($p < 0.05$) below the rate for all of Canada in 2007–08 and 2009–10, and the rates for Ontario women

were below the national average in 2009–10. Rates of monthly risky drinking for men and women in Ontario showed no statistically significant change between 2003 and 2009–10.

Figure A8. Trends in self-reporting monthly risky drinking (5+ drinks/occasion), current (past year) drinkers, general household population age 15+, Ontario



Sources: Canadian Community Health Survey; Statistics Canada.

Notes: These data use five or more drinks on a single occasion once a month or more to identify women who engage in risky drinking so that statistical significance can be reported. Rates would be an estimated 60% higher if four or more drinks on a single occasion were used as the measure. These data underestimate the true extent of risky drinking because of the under reporting endemic to self-reported drinking measures.

Revenue-cost analysis

A comparison of the direct government revenue and costs from alcohol in Ontario in 2002–2003 reveals that the province had a deficit of $465.4 million ($37.82 per capita). Looking more closely at per capita health and enforcement costs, Ontario is below the national average for alcohol-related healthcare costs ($96 per capita compared to $105 per capita for all of Canada) and above the national average for alcohol-related enforcement costs ($106 per capita compared to $98 per capita for all of Canada).

Minimum price regulations

Ontario has a complex system of minimum prices that apply to virtually all categories of products sold in government liquor stores with most categories adjusted for alcohol content. The Liquor Control Board of Ontario (LCBO) is responsible for setting and enforcing minimum price regulations in off-premise liquor stores, while the Alcohol and Gaming Commission of Ontario (AGCO) is responsible for enforcing price regulations in on-premise outlets such as bars, clubs and restaurants. Table A5 depicts minimum prices for alcohol products of standard alcohol content and volume sold in Ontario.

Table A5. Minimum prices per standard unit of alcohol for products of typical alcohol content and product volume sold in government liquor stores, Ontario, June 2010

Product	Minimum retail price per litre (including 13% HST)[15]	Typical alcohol content	Typical product volume	Minimum price per standard unit of alcohol for products of typical alcohol content (excludes deposits)	Lowest retail price per standard unit of alcohol for non-discounted products
Beer	$3.045/litre	5%	341 mL	$1.04	$1.06
Draught beer (≥ 18 L)	$2.456/litre	5%	58.6 L	$0.83	n/a
Cider	$4.56/litre	7%	330 mL	$1.13	$1.37
Wine (excluding bulk wine)	$6.16/litre	12.5%	750 mL	$0.84	$1.51
Fortified wine	$7.66/litre	20%	750 mL	$0.65	$0.85
Coolers	$58.87/litre of absolute alcohol	7%	330 mL	$1.00	$1.37
Spirits	$29.53/litre	40%	750 mL	$1.26	$0.96
Liqueurs	$20.38/litre	20–40%	750 mL	$1.74 – $0.87	n/a

Source: Liquor Control Board of Ontario; info on file with author.

Since July 2007, Ontario has set a minimum price of $2.00 per drink (12 oz. of beer, cider or cooler; 5 oz. of regular wine; 3 oz. of fortified wine; 1 oz. of spirits) for alcohol sold in licensed establishments. It also restricts many types of drink specials such as happy hour pricing and two-for-one drink specials. While the province adjusts these minimum prices in licensed establishments for product volume, for the most part these policies fail to take alcohol content into account and therefore do not create an enforceable price per standard unit of alcohol.

In addition to this basic minimum pricing structure, several categories of products sold in Ontario include adjustments for alcohol content. For example, minimum prices for high alcohol content in spirit products (those above 40% alcohol) increase from 5–10% based on alcohol content according to these volumetric formulas:

Low end = [(high alcohol content / 40) x floor price] x 1.05
High end = [(high alcohol content / 40) x floor price] x 1.10

Further, as shown in Table A6, Ontario bases its minimum prices for beer, coolers and miscellaneous low-alcohol spirit products on alcohol content.

[15] The LCBO does not have set minimum retail prices per litre. The figures shown reflect the lowest per litre amount among all standard selling units, excluding bulk wines and deposits.

Table A6. Minimum prices for beer, coolers and miscellaneous low-alcohol spirit products, Ontario

Alcohol content	Minimum price (excludes deposit)
Less than 4.1%	$3.045/litre
4.1% to less than 4.9%	$3.089/litre
4.9% to less than 5.6%	$3.17/litre
5.6% and higher	$58.87/litre of absolute alcohol

Source: Liquor Control Board of Ontario; info on file with author.

Price indexing

As part of recently passed legislation enhancing its liquor pricing system, Ontario indexes its minimum prices for beer, wine and spirits, as well as its basic mark-up rate for beer, every year based on a three-year average of the Ontario Consumer Price Index. The use of legislation to mandate indexation ensures liquor will not cheapen over time relative to other goods in the marketplace. Ontario is the only jurisdiction in Canada to mandate indexation in this way.

Price incentives for lower alcohol content beverages

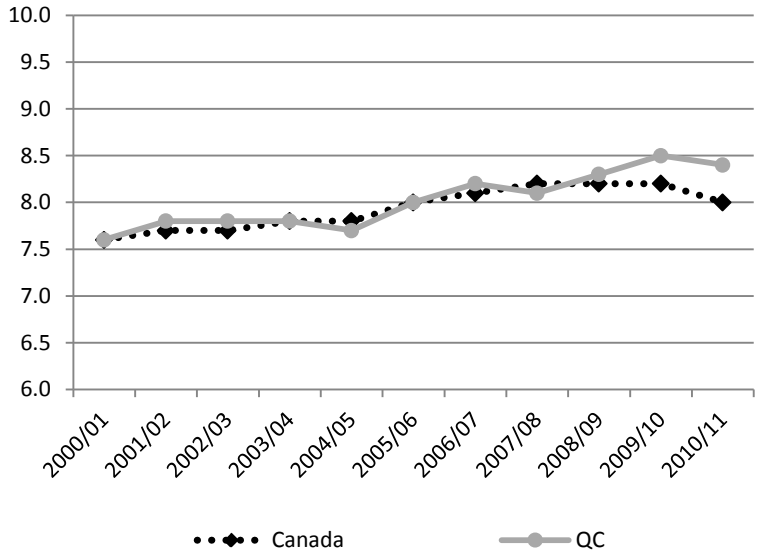
In addition to creating price incentives for lower strength products and price disincentives for higher strength products by setting its minimum prices based on alcohol content, Ontario also reduces its regular mark-up for light wines that contain less than or equal to 7% alcohol by approximately 12.5%. However, mark-ups for fortified wines (which have significantly higher alcohol content than standard table wines) are actually lower than standard wine mark-ups (66.7% compared to 68.8%), thereby creating price incentives for these higher alcohol content products.

Quebec

Alcohol consumption

Over the last decade, per capita alcohol consumption in Quebec has remained close to the average for all of Canada. From 1999–00 to 2010–11, average alcohol intake in Quebec increased from 7.5 litres of absolute alcohol to 8.4 litres, peaking at 8.5 litres per capita in 2009–10. The province's level of consumption for 2010–11 (8.4 litres) is equivalent to 492 standard drinks per year for every person age 15 years and older.

Figure A9. Per capita alcohol consumption in litres of pure alcohol, age 15+, Quebec and Canada, 1999–00 to 2010–11

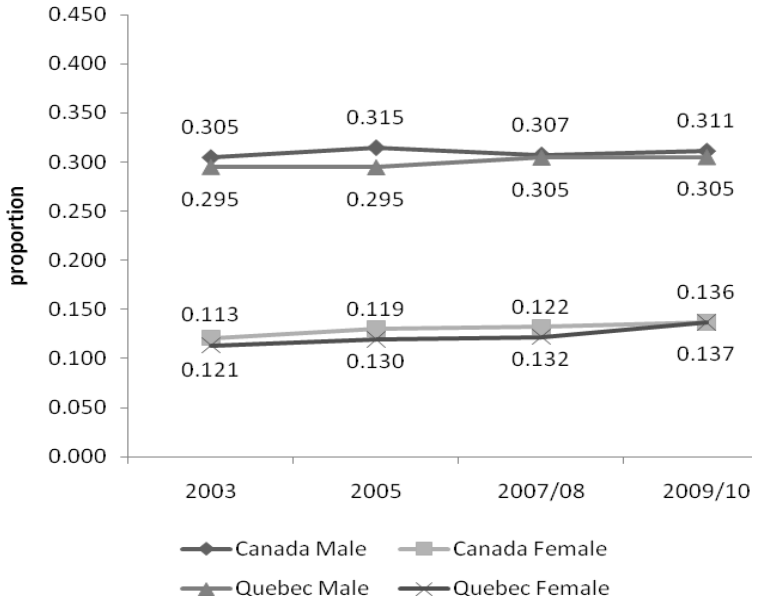


Source: Statistics Canada.

Trends in risky drinking

Figure A10 shows trends in self-reported risky drinking for men and women in Quebec between 2003 and 2009–10 using the measure of five or more drinks on a single occasion once a month or more in the past year. The rate of self-reported monthly risky drinking for men in Quebec was statistically significantly below the national average in 2003 and 2005, but was not statistically different in other years. The self-reported rate for women was statistically below the average for all of Canada in 2003, 2005 and 2007–08, but was not statistically significantly different in 2009–10. In terms of trends, while the rate of self-reported monthly risky drinking increased significantly ($p < 0.05$) for women in Quebec from 2003 to 2009–10, the rate for men showed no statistical difference.

Figure A10. Trends in self-reporting monthly risky drinking (5+ drinks/occasion), current (past year) drinkers, general household population age 15+, Quebec



Sources: Canadian Community Health Survey; Statistics Canada.

Notes: These data use five or more drinks on a single occasion once a month or more to identify women who engage in risky drinking so that statistical significance can be reported. Rates would be an estimated 60% higher if four or more drinks on a single occasion were used as the measure. These data underestimate the true extent of risky drinking because of the under reporting endemic to self-reported drinking measures.

Revenue-cost analysis

Comparing direct government revenue and costs from alcohol in Quebec in 2002–03 reveals that the province had a deficit of $396.3 million ($53.15 per capita). When comparing per capita costs, Quebec is below the national average for alcohol-related healthcare costs ($87 per capita compared to $105 per capita for all of Canada) and slightly below the national average for alcohol-related enforcement costs ($97 per capita compared to $98 per capita for all of Canada).

Minimum price regulations

Quebec sets minimum retail prices for beer but not for wine or spirit products. The Régie des alcool adjusts minimum prices for beer based on alcohol content as per Table A7 below.

Table A7. Minimum prices for beer products, Quebec, December 2010

Alcohol content	Minimum retail price per litre (including 12.875% sales tax)
Less than 4.1%	$2.95/litre
4.1% to 4.9%	$3.11/litre
5% to 6.2%	$3.23/litre
Greater than 6.2%	$3.34/litre

Source: Société des alcools du Québec; information on file with author.

At the published minimum retail price, bottled beer of typical alcohol content (5%) sold in liquor stores in Quebec delivers a standard drink for $1.10 including sales tax. However, Quebec's current pricing regime does not guarantee a minimum price per standard drink because it is not based on alcohol content. For example, an 8% alcohol beer priced at the minimum of $3.34/litre would deliver a standard drink for $0.71.

Price indexing

The Régie des alcool automatically adjusts minimum prices of beer based on the cost of living on April 1 of each year. However, this policy is not set out in legislation so it is vulnerable to change based on the discretion of the liquor authority.

Price incentives for lower alcohol content beverages

Other than the adjustments made for alcohol content for the minimum prices of beer, Quebec does not adjust it mark-ups based on alcohol content as is the case in several other jurisdictions. Rather, the province sets its mark-ups based on the dollar value of cases of alcohol products. For example, a case of non-fortified wine attracts a fixed mark-up of $27.00 and is then marked up 118% on the value between $20 and $40, 109% on the value between $40 and $55, 80% on the value between $55 and $75, 40% on the value between $75 and $175, and 65% on the value above $175. Cases of fortified wines in 750 mL bottles, however, have a fixed mark-up of only $20.00 and are then marked up 90% on the value between $20 and $100, 80% on the value between $100 and $200, and 70% on the value above $200. This price structure creates incentives for the consumption of the higher alcohol content fortified wines.

Other issues

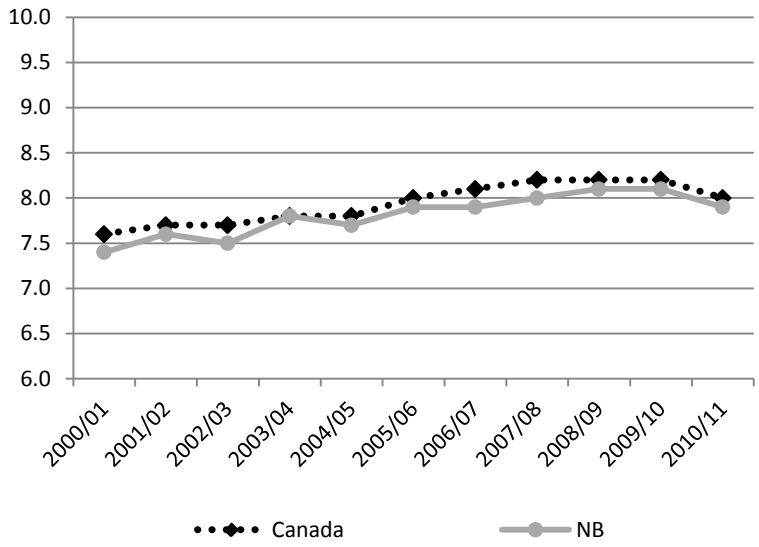
Quebec is the only jurisdiction in Canada that allows beer and wine to be sold in grocery and corner stores. This policy gives Quebec by far the highest retail outlet density in Canada at one outlet for every 342 people. This policy also means controlling prices is much more difficult than it would be in other jurisdictions where the majority of alcohol sales still occur through government-operated outlets.

New Brunswick

Alcohol consumption

Per capita alcohol consumption in New Brunswick is the lowest of any jurisdiction in Canada. Between 1998–99 and 2010–11, consumption increased from 6.5 litres of absolute alcohol to 7.9 litres, peaking at 8.1 litres per capita in 2008–09 and 2009–10. The province's level of consumption for 2010–11 (7.9 litres) is equivalent to 422 drinks per year for every person age 15 years and older.

Figure A11. Per capita alcohol consumption in litres of pure alcohol, New Brunswick and Canada, 1999–00 to 2010–11

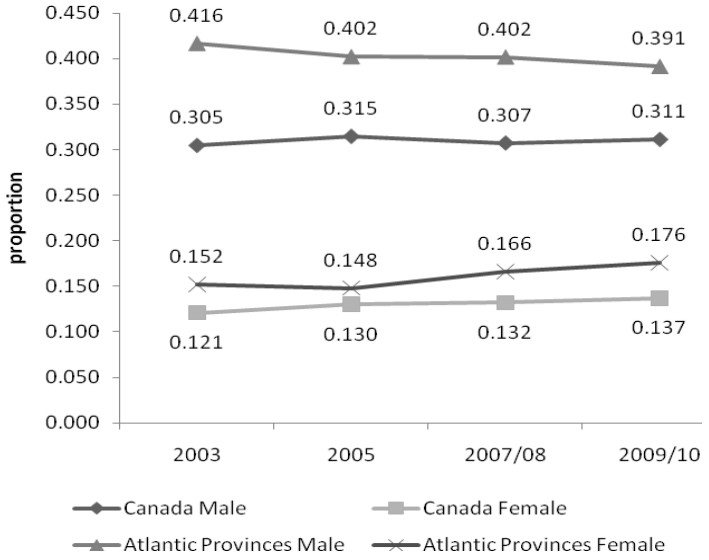


Source: Statistics Canada.

Risky drinking

Figure A12 shows trends in self-reported risky drinking for men and women in New Brunswick between 2003 and 2009–10 using the measure of five or more drinks on a single occasion once a month or more in the past year. For all years, the rates of self-reported monthly risky drinking for men and women age 15+ in the Atlantic provinces were statistically significantly above the national average. In terms of trends, rates of monthly risky drinking among men were statistically significantly lower in 2009–10 than they were in 2003 ($p < 0.05$), while rates for women showed a statistically significant increase from 2003 to 2009–10.

Figure A12. Trends in self-reporting monthly risky drinking (5+ drinks/occasion), current (past year) drinkers, general household population age 15+, Atlantic provinces (New Brunswick, Nova Scotia, Prince Edward Island)



Sources: Canadian Community Health Survey; Statistics Canada.

Notes: These data use five or more drinks on a single occasion once a month or more to identify women who engage in risky drinking so that statistical significance can be reported. Rates would be an estimated 60% higher if four or more drinks on a single occasion were used as the measure. These data underestimate the true extent of risky drinking because of the under reporting endemic to self-reported drinking measures.

Revenue-cost analysis

A comparison of the direct government revenue and costs from alcohol in New Brunswick in 2002–03 revealed that the province had a deficit of $42.1 million ($56 per capita). In terms of per capita alcohol-related health and enforcement costs, New Brunswick has the highest per capita alcohol-related healthcare costs in the country at $160 per capita—substantially higher than the national average of $105 per capita. However, New Brunswick is substantially lower than the national average when it comes to alcohol-related enforcement costs ($75 per capita compared to $98 per capita for all of Canada).

Minimum price regulations

New Brunswick has minimum retail prices for beer, wine and spirits but not for coolers and cider sold in liquor stores. However, the province does not adjust its minimum prices for alcohol content; as such, it does not create a true minimum price per standard drink. Table A8 below depicts minimum prices per standard unit of alcohol for products of typical alcohol content and product volume sold in liquor stores in New Brunswick.

Table A8. Minimum prices per standard unit of alcohol for products of typical alcohol content and product volume sold in government liquor stores, New Brunswick, June 2010

Product	Minimum retail price per litre (including 13% HST)	Typical alcohol content	Typical product volume	Minimum price per standard unit of alcohol for products of typical alcohol content and volume	Lowest retail price per standard unit of alcohol for non-discounted products
Beer	$4.77/litre	5%	341 mL	$1.62	$0.99
Wine	$9.74/litre	12.5%	750 mL	$1.42	$0.81
Spirits	$29.36/litre	40%	750 mL	$1.33	$1.27

Source: New Brunswick Liquor Corporation; information on file with author.

Price indexing

Unlike Ontario and Quebec, New Brunswick does not automatically index its minimum prices to inflation. The New Brunswick Liquor Corporation (NBLC) reviews its minimum price policies on an ad hoc basis as per its standard policy review processes. This means price adjustments are under the administrative discretion of the NBLC and may not occur if the corporation decides that circumstances are unfavourable for a price change.

Price incentives for lower alcohol content beverages

The mark-up structure in New Brunswick contains no provisions for adjusting prices based on alcohol content. As a result, there are significant price incentives for choosing higher alcohol content beverages.

Table A9 provides a summary of the major indicators and price policies for the six jurisdictions covered in detail in this appendix.

Table A9. Comparison of price-related factors and policies, select jurisdictions, Canada

	Per capita alcohol sales in standard drinks (2010–11)	Proportion of current drinkers age 15+ engaging in risky drinking at least monthly, with trend since 2003 (2009–10)[16]	Per capita alcohol-related deficit (2002–03)	Minimum prices for products of typical alcohol content and product volume sold in liquor stores (2010)	Minimum prices automatically indexed to inflation at least annually (2010)	Mark-ups adjusted based on alcohol content (2010)
BC	475	Males: 27.6 (+) Females: 13.8 (+)	-$17.83	Beer (packaged): $1.21 Wine (< 10 L in volume): $0.98 Spirits: $1.35 Coolers: $0.73	No (prices reviewed annually but not automatically indexed)	Beer: No Wine: Yes Spirits: No Coolers: Yes
AB	533	Males: 33.3† Females: 14.9†	-$48.97	n/a (minimum prices apply to on-premise establishments only)	No (prices reviewed on an ad hoc basis)	Beer: Yes Wine: Yes Spirits: Yes Coolers: Yes
SK	469	Males: 33.3† Females: 14.9†	-$20.40	Beer: $1.49 Wine: $1.47 Spirits: $1.35 Coolers: $1.25	No (prices reviewed annually but not automatically indexed)	Beer: Yes Wine: Yes Spirits: Yes Coolers: No
ON	440	Males: 31.1 Females: 12.5	-$37.82	Beer: $1.04 Wine: $0.84 Spirits: $1.26 Coolers: $1.00	Yes (policy set out in legislation)	Beer: No Wine: Yes Spirits: No Coolers: No
QC	492	Males: 30.5 (+) Females: 13.6 (+)	-$53.15	Beer: $1.10 Wine: n/a Spirits: n/a Coolers: n/a	Yes (for beer only; policy set administratively)	Beer: No Wine: No Spirits: No Coolers: No
NB	463	Males: 39.1 (-) Females: 17.6 (+)	-$56.00	Beer: $1.62 Wine: $1.41 Spirits: $1.33 Coolers: n/a	No (prices reviewed on an ad hoc basis)	Beer: No Wine: No Spirits: No Coolers: No

† These estimates are for the three Prairie provinces (Alberta, Saskatchewan and Manitoba) combined.

[16] These estimates are based on five or more drinks per occasion for both men and women so that statistically significant trends can be reported. Rates would be approximately 60% higher for women if the four or more drinks per occasion measure were used. (+) indicates an increasing trend between 2003 and 2009–10; (-) indicates a decreasing trend over the study period.

Appendix B: Research Gaps

The analysis presented above is based on the best available data on alcohol use, pricing and policy from across Canada. It is clear that additional information would be useful for creating and implementing more targeted price policies to reduce the health and social costs of alcohol.

First, we need more accurate alcohol consumption data. Significant sources of alcohol are absent in the official sales data collected by Statistics Canada, including wine and beer from home production and alcohol produced at commercial U-brew and U-vin establishments (Kendall, 2008).

Second, we need to develop methods for accounting for the discrepancy between what people report drinking on self-report surveys and what is actually sold. Current methods based on "usual quantity and frequency" of drinking account for only 30–40% of official sales (Stockwell, Sturge & Macdonald, 2005).

Third, we need detailed information on patterns of alcohol consumption like that available in the United Kingdom from the General Household Survey (Meier, Purshouse & Brennan 2009) and the National Alcohol Survey in the United States (Kerr & Greenfield, 2007), including information on drink of choice, average price paid per drink, typical place of purchase and consumption, and consumption by socio-demographic factors such as age, sex, geographic region and income.

Fourth, there is a need to apply the methods used by Murphy & McKillop (2006) to identify location- and population-specific prices that will be effective for reducing overconsumption by young adults and other risky drinkers across Canada. This information would greatly enhance our ability to target specific drinking patterns within the population and therefore allow for the potential development of more focused price policies. For example, research suggests risky drinking is not only increasing faster for women than for men but is also increasing faster within certain age groups of women (e.g., age 25–34). If detailed information was available on which products women in this age group favour, liquor authorities could adjust the prices for these products to help curb risky drinking among women in this age group.

Lastly, for evaluative purposes, baseline and annual data on alcohol-related harm and costs should be collected and published at the provincial/territorial level so that the effects of pricing policies on them can be monitored over time. This information would also be valuable for enhancing the effectiveness and specificity of pricing practices over the longer term.

Appendix C: Demographic Information on the Heaviest 10% and 20% of Alcohol Consumers

Data from the 2009 and 2010 Canadian Alcohol and Other Drug Use Monitoring Surveys (CADUMS) were used to determine which segments of the population were engaging in the heaviest drinking. We took the highest 10% and the highest 20% of consumers, then segmented them by age and sex (Table C1). These data verify that the vast majority of the heaviest alcohol use is accounted for by adults over the age of 25 (approximately 80–90% across the population) with only 10–20% accounted for by underage youth and young adults combined.

Table C1. Demographic characteristics of the top 10% and top 20% heaviest drinkers, Canada, 2009–10

Group	Heaviest 10% drinkers		Heaviest 20% drinkers	
	No.	% and 95% CI	No.	% and 95% CI
Male (all ages)	1,481	75.56 (72.44 – 78.67)	3,054	66.25 (64.03 – 68.47)
Female (all ages)	584	24.44 (21.33 – 27.56)	1,973	33.75 (31.53 – 35.97)
Total:		100%		100%
Underage females †	15	s	32	1.36 (0.72 – 2.01) √
Young adult females ‡	98	18.69 (12.39 – 25.00) √	213	11.10 (8.35 – 13.86)
Females 25–34	51	13.91 (8.00 – 19.82) √	154	12.61 (9.52 – 15.71)
Females 35–44	63	13.51 (8.87 – 18.14) √	273	17.40 (14.55 – 20.25)
Females 45–54	107	20.62 (15.00 – 26.23)	404	23.41 (20.16 – 26.65)
Females 55–64	134	16.20 (11.83 – 20.58)	433	18.51 (15.88 – 21.14)
Females 65+	116	14.86 (10.52 – 19.21)	395	15.60 (13.14 – 18.06)
Total:		100%		100%
Underage males †	49	2.23 (0.76 – 3.69) √	98	2.18 (1.22 – 3.14) √
Young adult males ‡	239	11.67 (8.87 – 14.46)	452	10.66 (8.81 – 12.52)
Males 25–34	173	15.82 (12.16 – 19.50)	333	16.99 (14.24 – 19.74)
Males 35–44	186	16.08 (12.38 – 19.77)	429	19.08 (16.41 – 21.76)
Males 45–54	260	22.25 (18.49 – 26.02)	540	20.18 (17.68 – 22.69)
Males 55–64	282	17.62 (14.46 – 20.79)	561	15.47 (13.43 – 17.50)
Males 65+	292	14.32 (11.62 – 17.03)	641	15.43 (13.50 – 17.37)
Total:		100%		100%

† Underage = 15–17 in Alberta, Manitoba and Quebec; 15–18 elsewhere in Canada.

‡ Young adult = 18–24 in Alberta, Manitoba and Quebec; 19–24 elsewhere in Canada.

√ Coefficient of variation (CV) between 16.6 and 33.3: Estimate has moderate sampling variability and should be interpreted with caution.

s CV = 33.3+: Estimate unstable and should be suppressed.