

# Alcohol Pricing, Public Health and the HST: Proposed Incentives for BC Drinkers to Make Healthy Choices



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## SUMMARY

The Government of British Columbia is committed to making the province one of the healthiest jurisdictions in the world. While the widespread use of beverage alcohol provides economic and social benefits to many British Columbians, its use is also associated with significant health and social harms. One recently published study revealed that the annual health and enforcement costs associated with alcohol directly borne by government in British Columbia were \$57 million higher than government revenue from alcohol sales in 2003 (Kendall, 2008). The total indirect costs of alcohol-related harm in British Columbia, including lost productivity and other social impacts, are harder to estimate but are substantial (Rehm et al, 2006).

Research from around the world and from Canada confirms that many types of alcohol-related problems increase when per capita consumption increases. However, the relationship between alcohol-related harms/costs and overall consumption also depends on the patterns of drinking, with some types of drinking more harmful and costly than others.

International research also confirms that raising and maintaining the price of alcohol is one of the most effective ways of controlling consumption at the population level and, by extension, reducing alcohol-related health and social harms in society. However, there is sometimes resistance to the use of price to control harms because it can be perceived as a relatively blunt policy instrument which applies to all drinkers, even those who do not engage in risky alcohol use. While some low-risk drinkers may see this as being punished for the excessive drinking of a minority, another perspective is that light drinkers are minimally affected by such policies personally and stand to benefit from both increased safety and reduced costs in their communities.

Fortunately, research is pointing the way toward more discerning alcohol pricing policies that more effectively target hazardous patterns of drinking. These policies include:

1. setting and enforcing a minimum price per standard drink and applying it to all products,
2. altering markups to decrease the price of low alcohol content beverages and increase the price of high alcohol content beverages, and
3. indexing minimum prices and markups to inflation to ensure that alcohol does not become cheaper relative to other commodities over time.

Looking forward to 2010, a convergence of economic, social and political factors is creating a window of opportunity that could allow the Government of British Columbia to maintain the benefits and lower the costs of alcohol by strategically modifying its pricing policies based on these state-of-the-art guidelines. This policy brief presents the case for altering BC's approach to alcohol pricing, conveys basic evidence-informed principles upon which these modifications should be based, and sets out feasible recommendations that could, among other things, contribute significantly to the province's goal of becoming one of the healthiest jurisdictions in the world.

## WHY CHANGE BC'S ALCOHOL PRICING POLICIES?

### PRICING POLICIES ARE AMONG THE MOST EFFECTIVE POLICIES FOR CONTROLLING HARMS

Governments around the world use a variety of programs and policies in their attempt to optimize society's relationship with beverage alcohol, that is, to maximize the benefits and minimize the harms from alcohol

use. These policies include limiting access to alcohol (e.g., legal drinking age laws), prohibiting driving under the influence, and fiscal policies that increase the price of alcohol.

International reviews of the research evidence consistently show that pricing policies are among the most effective tools for maximizing the benefits and minimizing the harms from alcohol (Babor et al., 2003; Toumbourou et al., 2007; Anderson et al., 2009). These policies increase fiscal benefits by generating substantial revenue for governments (direct revenue totalled over \$1 billion in BC in 2008) and reduce harms by helping control consumption at the population level.

Although there are important differences between 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 tend to decrease (if other factors such as income are kept constant). Recent studies summarizing the international research agree that a 10% increase in price will usually result in about a 5% decrease in consumption (Gallet et al., 2007; Wagenaar, Salois, & Komro, 2009). This is important because research also shows that decreases in consumption at the population level almost invariably translate into decreases in health and social harms. In particular, the inverse relationship between alcohol prices and alcohol-related harms has been empirically verified for the following problems:

- Deaths from liver cirrhosis, alcohol poisoning (overdose), alcohol-related cancers, cardio-vascular diseases and others (Wagenaar, Maldonado-Molina & Wagenaar, 2009)
- Violence, including spousal abuse (Markowitz, 2000), child abuse (Markowitz & Grossman, 2000), suicide (Markowitz et al., 2003), and other forms of violence (Markowitz, 2005)
- Fatal traffic accidents among youth, young adults and adults (Chaloupka et al., 1993)
- Other health and social consequences, including non-fatal workplace accidents (Ohsfeldt & Morrissey, 1997), teenage pregnancy (Sen, 2003), and the incidence of sexually transmitted infections (Sen & Luong, 2008)

## ALCOHOL CONSUMPTION IS INCREASING

Based on official sales records, between 1998 and 2008, alcohol consumption in BC increased 16% from 7.5 litres per capita to 8.7 litres per capita. By comparison, alcohol consumption across Canada increased approximately 9.3% during the same period, from 7.5 to 8.2 litres of absolute alcohol per person age 15+ (Statistics Canada, 2008 and various years).

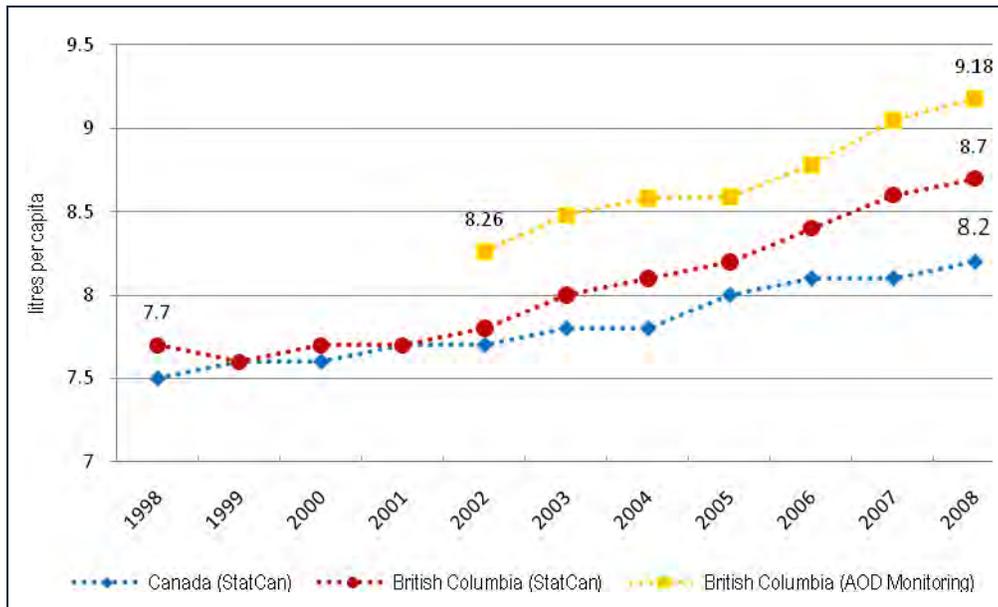
Researchers at the Centre for Addictions Research of BC (CARBC) have generated more accurate estimates of per capita alcohol consumption in British Columbia.<sup>1</sup> These data indicate that alcohol consumption increased from 8.26 litres in 2002 to 9.18 litres in 2008. Put another way, on average, everyone age 15+ in BC increased their drinking from almost 475 drinks (e.g., cans of beer, glasses of wine or cocktails) in 2002 to over 525 in 2008 (Figure 1).

Two observations are evident from this chart. First, per capita alcohol consumption in BC has increased in 9 of the last 10 years based on Statistics Canada data. Second, beginning in 2002, consumption increased more quickly in BC than for the rest of Canada. This diverging trend has created a 0.5 litre per capita gap between

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<sup>1</sup> The CARBC Alcohol and Other Drug Monitoring Project data includes estimates for alcohol distributed through U-vin and U-brew facilities and more accurate estimates of alcohol content for wine and coolers sold in liquor stores. Data for 2002–2005 showed that the typical alcoholic strength of wine and coolers sold from liquor stores in BC was higher than assumed by Statistics Canada (12.2% versus 11.5% for wine, and 6.7% versus 5% for coolers).

Figure 1: Comparison of consumption estimates in litres of absolute alcohol per capita age 15+, BC and Canada, 1998-2008



Sources: Statistics Canada, 2009; Statistics Canada, 2008 and various years; CARBC, 2009.

average consumption in BC and average consumption for all of Canada in 2008.<sup>2</sup> The increase in consumption is significant because research suggests that increases in consumption often lead to increases in alcohol-related health and social harms.

### SOME ALCOHOL-RELATED HARMS IN BC ARE INCREASING

BC Vital Statistics publishes yearly data on deaths directly and indirectly related to alcohol in BC in its annual reports (Table 1). These data indicate that total alcohol-caused deaths increased 9.6% between 2002 and 2007, which was higher than the increase in deaths from all causes (8.4%) over the same time frame. Significantly, the number of deaths attributed to cirrhosis of the liver, one of the most accurate indicators of alcohol-related health harms, increased 38.7% between 2002 and 2007.<sup>3</sup> This is more than four times the increase in the rate of deaths from all causes during the same time interval.

Data from a roadside survey in Vancouver and Saanich suggests that

Table 1: Alcohol-caused Deaths, BC, 2002–2007

Year	Total Deaths All Causes	Total Alcohol-related Deaths	Deaths from Liver Cirrhosis
2002	28,686	1,818	271
2003	29,108	1,789	302
2004	29,652	1,860	272
2005	30,033	1,878	293
2006	30,513	1,986	314
2007	31,105	1,993	376
% Change	+ 8.4%	+ 9.6%	+ 38.7%

Source: BC Vital Statistics, 2008 and various years. Population estimates taken from the BC Stats webpage.

<sup>2</sup> A policy allowing for the rapid expansion of non-government liquor stores was introduced in BC in 2002 which led to a 65% increase in total outlets. According to forthcoming research, this shift in the physical availability of alcohol may explain some of the growth in consumption in the province since 2002 (Stockwell et al., in press).

<sup>3</sup> Deaths from alcoholic liver cirrhosis as reported by BC Vital Statistics increased at an even faster rate, but it is apparent that BC physicians are becoming more likely to add the term "alcoholic" to their diagnoses of cirrhosis. It was deemed more accurate to combine alcoholic and non-alcoholic causes of cirrhosis so as not to overestimate this increase.

less people in BC may be driving after drinking alcohol (18.7% in 1995 to 7.8% in 2008), but that the percentage of those who are driving while legally impaired (i.e., with a BAC  $\geq$  0.08) has increased from 2% in 1995 to 2.7% in 2008 (Figure 2). After years of decline, the rate of impaired driving charges has been rising in BC since 2000 (Kendall, 2008).

### DIRECT COSTS OF ALCOHOL EXCEED DIRECT BENEFITS IN BC

Both the benefits and costs of alcohol in BC are substantial. However, comparisons of total benefits and total costs are difficult

to make because of serious information gaps on both sides of the balance sheet. For example, costs such as those caused by the disruption of family functioning due to excessive alcohol use are not measurable even though they are likely to be substantial when factored across the entire population. Similarly, it is not feasible, with current methods, to calculate the value of the various psychosocial benefits associated with the responsible use of alcohol.

However, it is possible to meaningfully compare alcohol-related benefits and costs by focusing on direct, measurable benefits and costs at the provincial level. *The Costs of Substance Abuse in Canada* study provides carefully constructed estimates of direct alcohol-related enforcement and health costs for all jurisdictions in Canada for 2002 (Rehm et al., 2006). On the benefits side, it is possible to use the overall net government revenue from the control and sale of alcohol in BC (including sales taxes) published annually by Statistics Canada (Statistics Canada, 2008 and various years). This comparison is meaningful because it is drawn from solid estimates, and because it includes the direct benefits and costs most relevant to the provincial government in terms of budgetary considerations (Figure 3).

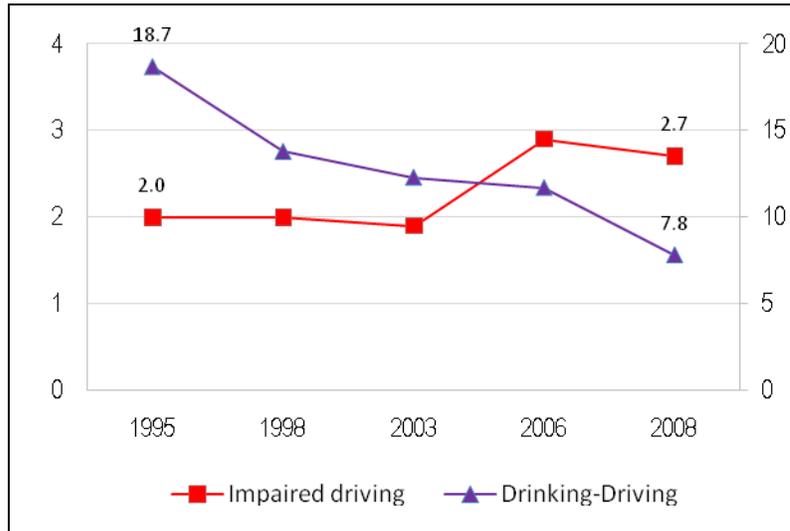
These data indicate that BC's direct alcohol-related social costs exceeded direct government revenue by approximately \$57 million in 2002. Unfortunately, it is not possible to update this analysis for later years because, unlike revenue, social costs are not monitored on an ongoing basis.

### PRICE TARGETS HAZARDOUS DRINKING

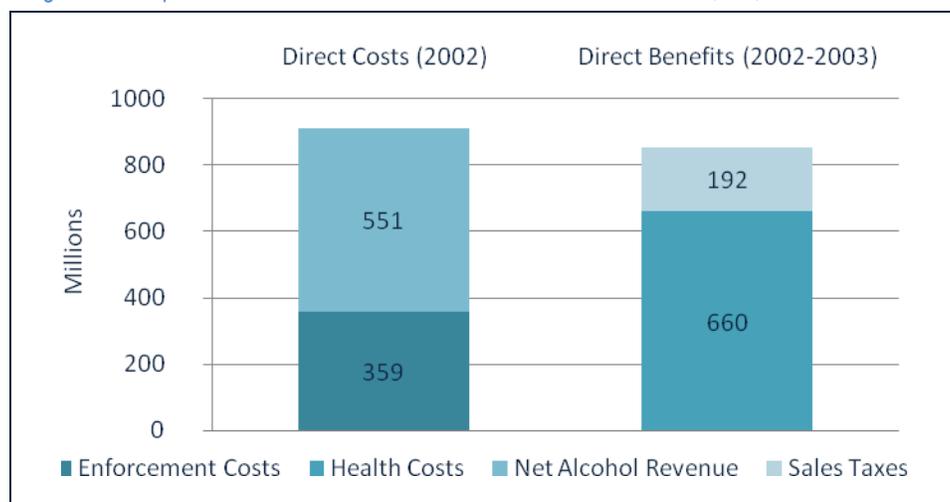
The vast majority of British Columbians drink alcohol. In 2008, just under 90% of the population age 15+ reported that they had drunk alcohol at least once in their lifetime. Further, 77% of the population reported drinking in the past year, and 66% reported drinking at least once in the past month (Health Canada, n.d.). Most people who consume alcohol only occasionally drink at a level which puts their health and safety at risk and have low probability of causing major harm to themselves or others.

The challenge for effective evidence-based policy is to maximize the benefits and minimize the harms related to alcohol. To do so, pricing policies should increase benefits while providing growing disincentives for ever more risky patterns of consumption. Increasing the price of alcohol actually meets this test. For example, if

Figure 2: Alcohol consumption among night-time drivers in Vancouver and Saanich, 1995-2008



Source: Beirness & Beasley, 2009.

Figure 3: Comparison of Direct Economic Costs and Benefits of Alcohol, BC, 2002-2003<sup>4</sup>

Sources: Costs: Rehm et al., 2006; Benefits: Statistics Canada, 2003.

the price of alcohol were to increase by 10 cents per drink, the impact on harmful patterns of drinking would result in benefits for everyone in terms of decreased healthcare and insurance costs and increased safety. Those who do not drink would reap these benefits without paying anything. The majority of drinkers whose drinking is within low-risk drinking guidelines might pay an additional \$1 or \$2 per week but still experience a net benefit. Only heavy frequent drinkers, whose patterns of drinking cause the most harm, would pay significantly more (Cook, 2008).

## SHIFTING TOWARD EVEN MORE TARGETED PRICING POLICIES

Fortunately, recent research is pointing the way to even more discerning pricing policies. These will target risky drinking practices more specifically and provide incentives for healthier patterns of alcohol use. The following findings are relevant here:

- even one or two drinks per day can increase risk of serious illnesses, including liver disease and some kinds of cancer, and the level of risk is directly related to how much alcohol is consumed over the years (Rehm et al, 2009)
- when alcohol prices increase, drinkers tend to react by both reducing consumption and substituting cheaper products for more expensive products (Gruenwald et al., 2006)
- contrary to popular belief, heavy drinkers are responsive to price changes even if slightly less so than light or moderate drinkers (Wagenaar, Salois & Komro, 2009)
- regular heavy drinking is concentrated in the young adult population, and these drinkers tend to be more price sensitive compared to mature drinkers due to lower average incomes and lower prevalence of alcohol dependence (Adlaf et al., 2005; Chaloupka et al., 2002)

<sup>4</sup> These figures provide an incomplete estimate of total direct social costs because it excludes other direct costs (e.g., those for research and prevention, etc.) and costs to the system derived from alcohol misuse that are not officially registered as alcohol-related, which are likely substantial. They also provide an incomplete estimate of total direct benefits because it does not include corporate and personal income taxes from companies and employees in alcohol-related industries/sectors.

- policies and programs that eliminate low-cost access to alcohol are effective ways of responding to heavy and frequent alcohol use among college students (Murphy and MacKillop, 2006)
- the more a person drinks, the less they pay for their alcohol per standard drink. According to Kerr and Greenfield (2007), the heaviest 10% of drinkers by volume reported spending \$0.79 per drink, compared to \$4.75 per drink spent by the bottom 50% of drinkers.
- drinkers cannot reliably tell the difference between similar lower and higher strength beers in simulated group drinking situations, and they enjoy the social situation equally well and feel equally intoxicated whether drinking low or regular strength beer despite having significantly higher BACs with the regular strength beer (Segal and Stockwell, 2009)

Taken together, these results suggest three guiding principles to inform the development of targeted alcohol pricing policies in BC:

1. focus on minimum prices rather than overall prices to remove cheap sources of alcohol favoured by many who drink hazardous amounts
2. base prices on alcohol content, creating price incentives for lower strength (less hazardous) products and price disincentives for higher strength products
3. regularly review prices vis-à-vis inflation and adjust as necessary to ensure that alcohol does not become cheaper over time relative to other commodities

Integrating these principles into alcohol pricing policy in BC would involve developing specific pricing strategies. These would include establishing a minimum price per standard drink<sup>5</sup> applying it to all products, and then adjusting this minimum price with inflation annually. It would also involve adjusting markup schedules to create incentives for lower strength products and disincentives for higher strength products within all beverage classes.

This would involve calculating the price per standard drink for all products sold in BC and adjusting markups and introducing retail policies to ensure that no product delivers a standard drink for less than the agreed upon minimum.<sup>6</sup> Calculating price per standard drink is relatively simple because the Liquor Distribution Branch already monitors price, product volume and alcohol content for all products sold in its stores.

A relevant comparison here is with the major success of low- to mid-strength beers (2.5% to 3.8% alcohol by volume) in Australia. In the late 1980s, tax incentives (both federal and state) encouraged the production of these products, and excise tax rates are now updated quarterly in line with the consumer price index. The market share of these beverages in terms of value reached 40% of the total Australian beer market by the late 1990s (Stockwell & Crosbie, 2001). These products are also widely used at large-scale sporting venues as a way of reducing problems with alcohol-related violence because the consumption of lower strength products means lower blood alcohol levels for those attending the events.

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<sup>5</sup> A standard drink in Canada is 13.6 grams of alcohol, which is roughly equivalent to one 5% alcohol beer, one 150 ml glass of 12% alcohol wine, and one cocktail with 50 ml of 40% alcohol spirits.

<sup>6</sup> Other provinces have already introduced minimum prices for defined standard servings of different alcoholic beverages containing roughly the same amount of alcohol. Ontario, Nova Scotia and Alberta have defined minimum prices for drinks sold in bars and restaurants. Quebec sets its minimum prices relative to alcohol strength and adjusts for inflation.

## THE HST: A RARE OPPORTUNITY TO ENHANCE BC'S ALCOHOL PRICING POLICIES

One fiscal factor unique to BC that has direct bearing on alcohol pricing policies is the planned replacement of the Provincial Sales Tax (PST) with the Harmonized Sales Tax (HST) in July 2010. The introduction of the HST is expected to increase government revenue, mostly because many services currently exempt from PST will be taxed under the HST.

The switch to the HST has direct bearing on alcohol pricing policy because BC currently adds an extra 3% sales tax to all alcohol products over and above the 7% sales tax administered under the PST. The value of the extra 3% sales tax on alcohol is estimated to be over \$60 million per year at current levels of consumption. Given the current budget situation, the province is likely to act to preserve this revenue. Indeed, recent reports from reliable economic observers indicate that the province is planning to adjust markups by 3% across the board so that shelf prices remain the same for all alcohol products sold in liquor stores in BC (Deloitte, 2009). The introduction of the HST, however, creates an opportunity for BC to enhance its alcohol pricing policies rather than simply maintain the status quo.

### SPECIFIC RECOMMENDATIONS FOR APPLYING POLICY

An analysis of alcohol sales data for the financial year 2008/2009 provided to CARBC by the Liquor Distribution Branch shows that the incentives provided to drinkers in BC currently favour high alcohol content products in some beverage categories. Tables 2 and 3 below show market share and retail prices per litre of absolute alcohol for different strength beers and coolers.

What is striking from Table 2 is that per litre of alcohol retail prices are highest for the lowest alcohol content beers. Table 3 reveals an even more striking incentive in favour of higher alcohol content versus lower alcohol content coolers up to 7% alcohol content.

Table 2: Market share and price incentives for consumers to drink different strength beers in BC, FY2008/09

Strength % alcohol	Mean \$/L absolute alcohol	Market share in L (%)	Market share in \$ (%)
2.9-3.9	122.68	0.15	0.13
4.0	116.03	6.51	6.17
4.1-4.9	104.61	10.55	10.15
5.0-5.09	95.89	71.35	70.56
5.1-5.9	94.13	6.86	7.26
6.0-6.9	93.46	2.06	2.53
7.0 +	88.49	2.52	3.19
<b>Total</b>	<b>102.18*</b>	<b>100</b>	<b>100</b>

Source: Sales and pricing data supplied from the BC Liquor Distribution Branch, analysis by CARBC.

\*This figure represents the estimate of mean dollars per litre of absolute alcohol for all beer sold in BC in 2008/09.

Table 3: Market share and price incentives for consumers to choose different strength coolers in BC, FY2008/09

% Strength	Mean \$/L absolute alcohol	Market share in L (%)	Market share in \$ (%)
3.9-4.9	118.57	2.38	2.06
5.0-5.09	118.27	11.15	11.04
5.1-5.9	112.98	9.26	9.55
6.0-6.9	93.63	7.77	7.79
7.0	86.16	69.18	69.20
7.1 +	127.13	0.25	0.37
<b>Total</b>	<b>109.46*</b>	<b>100</b>	<b>100</b>

Source: Sales and pricing data supplied from the BC Liquor Distribution Branch, analysis by CARBC.

\* This figure represents the estimate of mean dollars per litre of absolute alcohol for all coolers sold in BC in 2008/09.

Table 3 also provides a good illustration of the power of alternative taxation and pricing strategies to shape market behaviour. The relatively high price for coolers above 7% alcohol content is caused by an increase in excise tax at that level. Very few people drink coolers that are above 7%, while those at exactly 7% that deliver maximum alcohol content per dollar spent represent 69% of the total market share of coolers in BC.

Changes could be introduced as part of the pricing modifications during the conversion to the HST in July 2010 that would start to apply the principles suggested above. In looking at the current structure of sales, market share and minimum prices, we recommend the following alcohol pricing policies be introduced as part of the adjustment to the HST.

1. Determine a socially relevant minimum price per standard drink (e.g., \$1.50 for alcohol sold in liquor stores and \$3.00 for drinks in bars and restaurants) and adjust markups/prices so that no product delivers a standard drink for less than this price in BC. The agreed upon price per standard drink should be reviewed annually and updated according to the rate of inflation (CPI).
2. Adjust the markups schedule for all product classes to create price disincentives for higher strength products and price incentives for lower strength products (see initial suggestions in Table 4). Markups should be adjusted annually to reflect the rate of inflation and to continue to create price incentives for lower strength products.
3. If these pricing changes increase revenue, a portion of this increase should be set aside to fund effective programs for addressing alcohol-related problems in the province.

Table 4: Suggested initial adjustments to markup schedule for each product class in BC coinciding with the introduction of the HST in July 2010

Alcohol Content Band	Policy
Low Strength	No increase in markup (3% decrease in price after implementation of the HST)
Moderate Strength	3% increase in markup (no price change after implementation of the HST)
High Strength	6% increase in markup (3% price increase after implementation of the HST)

## CONCLUSION

A confluence of economic, social and political factors has created a window of opportunity for BC to review and update its alcohol pricing policies based on the state-of-the-art knowledge. This policy paper has reviewed the contextual factors relevant to alcohol pricing policies in BC and presents the case for altering the current approach to maintain or slightly increase the benefits from alcohol while reducing alcohol-related costs. Three basic principles serve as the backbone to this approach: (1) setting and enforcing a minimum price per standard drink, (2) adjusting markups so that price incentives are created for lower alcohol content beverages and price disincentives are created for high alcohol content beverages, and (3) adjust the minimum social reference price and markups based on inflation at least yearly. A careful introduction of these strategies would significantly reduce the 2,000 alcohol-related deaths in BC each year along with the many alcohol-related hospitalizations, crime events, social harms and related economic costs.

## REFERENCES

- Adlaf, E., Begin, P., & Sawka, E. (Eds.) (2005). *Canadian Addiction Survey (CAS): A national survey of Canadians' use of alcohol and other drugs: Prevalence of use and related harms: Detailed report*. Ottawa, ON: Canadian Centre on Substance Abuse. Available at: <http://www.ccsa.ca/NR/rdonlyres/6806130B-C314-4C96-95CC-075D14CD83DE/0/ccsa0040282005.pdf>
- Anderson, P., Chisholm, D. & Fuhr, D.C. (2009). Effectiveness and cost-effectiveness of policies and programmes to reduce the harm caused by alcohol. *The Lancet*, 373:2234-46.
- Babor, T., Caetano, R., Casswell, S., Edwards, G., Giesbrecht, N., Graham, K., et al. (2003). *Alcohol: No ordinary commodity, Research and public policy*. New York: Oxford University Press.
- Beirness, D. & Beasley, E. (2009). *Alcohol and drug use among drivers: British Columbia roadside survey 2008*. Ottawa, ON: Canadian Centre on Substance Abuse.
- BC Liquor Distribution Branch (2009). *2008-09 Annual report*. Vancouver, BC: BC Liquor Distribution Branch. Available at [http://www.bcliqorstores.com/files/attachments/pdfs/2008-09\\_AnnualReport.pdf](http://www.bcliqorstores.com/files/attachments/pdfs/2008-09_AnnualReport.pdf)
- BC Vital Statistics (2008 and various years). *Annual report, 2007*. Available at <http://www.vs.gov.bc.ca/stats/annual/index.html>
- Centre for Addictions Research of BC (CARBC) (2009). BC Alcohol and Other Drug Monitoring Project. Project website: <http://carbc.ca/Default.aspx?tabid=402>
- 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.J. (2008). A free lunch. *Journal of Drug Policy Analysis*, 1(1): Article 2. Available at: <http://www.bepress.com/jdpa/vol1/iss1/art2>
- Deloitte (2009). 2009 BC budget update highlights. Available at: [http://www.deloitte.com/assets/Dcom-Canada/Local%20Assets/Documents/Tax/EN/ca\\_en\\_tax\\_2009\\_September\\_BC\\_budgetUpdate.pdf](http://www.deloitte.com/assets/Dcom-Canada/Local%20Assets/Documents/Tax/EN/ca_en_tax_2009_September_BC_budgetUpdate.pdf)
- Gallet, C.A. (2007). The Demand for Alcohol: A Meta-analysis of Elasticities, *Australian Journal of Agricultural and Resource Economics*, 51(2):121-135.
- 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 Experimental Research*, 30(1):96-105.
- Health Canada (n.d.). Canadian alcohol and drug use monitoring survey, summary results for 2008. Available at [http://www.hc-sc.gc.ca/hc-ps/drugs-drogues/stat/\\_2008/summary-sommaire-eng.php](http://www.hc-sc.gc.ca/hc-ps/drugs-drogues/stat/_2008/summary-sommaire-eng.php)
- Kendall, P. (2008). *Public health approach to alcohol policy: An updated report from the Provincial Health Officer*. Victoria, BC: Office of the Provincial Health Officer. Available at: <http://www.health.gov.bc.ca/library/publications/year/2008/alcoholpolicyreview.pdf>
- Kerr, W.C. & Greenfield, T.K. (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 Experimental Research*, 31(10):1714-1722.
- 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*, 67:279-303.
- 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.
- 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*. Available at: [http://www.nationalframework-cadrenational.ca/uploads/files/FINAL\\_NAS\\_EN\\_April3\\_07.pdf](http://www.nationalframework-cadrenational.ca/uploads/files/FINAL_NAS_EN_April3_07.pdf)
- Ohsfeldt, R. & Morrissey, M. (1997). Beer taxes, workers compensation, and industrial injury. *Review of Economic Statistics*, 79:155-160.
- Pernanen, K., Cousineau, M., Brochu, S. & Sun, F. (2002). *Proportions of crimes associated with alcohol and other drugs in Canada*. Ottawa, ON: Canadian Centre on Substance Abuse (CCSA). Available at: <http://www.ccsa.ca/2003%20and%20earlier%20CCSA%20Documents/ccsa-009105-2002.pdf>
- Rehm, J., Baliunas, D., Brochu, S., Fischer, B., Gnam, W., Patra, J., Popova, S., Sarnocinska-Hart, A. & Taylor, B. in collaboration with Adlaf, E., Recel, M., Single, E. (2006). *The costs of substance abuse in Canada 2002*. Ottawa, ON: Canadian Centre on Substance Abuse.
- Rehm, J., Mathers, C., Popova, S., Thavorncharoensap, M., Teerawattananon, Y. & Patra, J. (2009). Alcohol and Global Health 1: Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. *The Lancet*, 373:2223-33.
- Segal, D. & Stockwell, T. (2007). *Low alcohol alternatives: A promising strategy for reducing alcohol-related harm*. Victoria, BC: Centre for Addictions Research of BC.
- 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.
- Statistics Canada (2008 and various years). *The control and sale of alcoholic beverages*. Ottawa, ON: Statistics Canada. Annual reports since 1997 available at: <http://www.statcan.ca/bsolc/english/bsolc?catno=63-202-X&CHROPG=1>
- Statistics Canada (2009). *The daily: The control and sale of alcoholic beverages, Fiscal year ending March 31, 2008*. Available at: <http://www.statcan.gc.ca/daily-quotidien/090420/t090420b2-eng.htm>
- Stockwell, T.R. & 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., 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.
- Toumbourou, J., Stockwell, T., Neighbors, C., Marlatt, A., Sturge, J. & Rehm, J. (2007). Interventions to reduce harm associated with adolescent substance use. *The Lancet*, 369: 1391-1401.
- 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(8): 1464-1470. Available at: <http://www.ajph.org/cgi/reprint/AJPH.2007.131326v1>
- 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.