



Caffeinated Alcoholic Beverages and Injury

COLLABORATION ATLANTIQUE
POUR LA PRÉVENTION DES BLESSURES

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ATLANTIC COLLABORATIVE
ON INJURY PREVENTION

Background & Purpose

In 2010, ACIP produced a resource entitled *Alcohol & Injury in Atlantic Canada: Creating a Culture of Safer Consumption* which assembled evidence on the impact of alcohol and alcohol policy on injury, including the impact of the culture of consumption in Atlantic Canada, and recommendations for change. The report has generated a variety of calls for further information on certain topic areas. An emerging issue of interest to health and injury prevention practitioners and stakeholders is the acute effect of caffeinated-alcoholic beverages (and/or the combination of alcohol and high caffeine energy drinks) on risk for injury. There is a need to gather the available research and understand the implications for injury prevention practitioners.

ACIP is embarking on an environmental scan to explore the impact of caffeinated alcohol beverages (and/or the combination of alcohol and high caffeine energy drinks) on rates of injury, intentional and unintentional, and patterns of hazardous consumption. It is hoped the environmental scan will help in formulating recommendations for reducing injuries related to caffeinated alcoholic beverages (and/or the combination of alcohol and high caffeine energy drinks) in Atlantic Canada.

About ACIP

The Atlantic Collaborative on Injury Prevention (ACIP) is a non-government organization working to reduce the burden of injury in Atlantic Canada by facilitating coordination of injury prevention activities.

Prepared by:
Research Power Inc.



Finding the solution is simple when you know how

Literature Review

The literature review included a search, review and synthesis of the academic literature (peer reviewed journals). Databases searched for this review included Prowler, PubMed, Science Direct, CINAHL, Cochrane Library, Academic Search Elite, EBSCO, and Proquest as well as individual searches within key journals. Grey literature searching was also conducted to identify key websites and reports (e.g., government).

Full references from the grey and academic literature search are provided at the end of this report.

Key Informant Interviews

Telephone interviews were conducted between January 2011 and February 2011 with the following key informants:

- **Dr. Robert Strang**, Chief Public Health Officer/Chief Medical Health Officer, Nova Scotia Department of Health & Wellness
- **Dr. Sean Barrett**, Assistant Professor, Department of Psychology – Dalhousie University (Halifax, Nova Scotia)
- **Alan Lieberman**, Deputy Attorney General, State of California
- **Marlene Trestman**, Special Assistant to the Attorney General, State of Maryland
- **James F. Mosher**, Alcohol Policy Analyst, Alcohol Policy Consultations
- **Dr. David Jernigan**, Director of Center on Alcohol Marketing and Youth- Johns Hopkins (Maryland)
- **Michele Simon**, Research & Policy Director- Marin Institute (California)

Consultants from *Research Power Inc.* completed the data collection. Each telephone interview lasted approximately 45 minutes, was audio-recorded (with participant's permission) and transcribed. An interview guide was developed by the consultants, in collaboration with ACIP, to inform the interview discussions. Once transcribed, the data was thematically analyzed using the qualitative software package NVivo (version 7).

About Caffeinated-Alcoholic Beverages (and/or the Combination of Alcohol & High Caffeine Energy Drinks)

Introduction to the Marketplace

Energy drinks were first introduced to the marketplace in 1997. Energy drinks contain high amounts of caffeine from 80-160 mg/can (Arria, et al., 2011) as well as high concentrations of sugar and other ingredients (MacDonald et al., 2010). The popularity of these drinks has been substantial in Canada with an average annual growth rate of 5.7% from 2001-2006. Total energy drink sales reached 34.8 million liters in 2006 and are forecasted to increase to 46.3 million liters in 2011 in Canada (Agriculture & Agri-Food Canada, 2008).

Although the introduction of pre-mixed caffeinated alcohol beverages is relatively new, similar to their non-alcoholic counterparts, these products have experienced a rapid growth in popularity. Caffeinated alcoholic beverages usually contain higher alcohol amounts than beer (e.g., 5-12%) and high caffeine amounts which are often not reported (California Dept. of Alcohol & Drug Programs). In the US, the two leading brands of caffeinated alcohol beverages saw a 67 fold increase in sales, from 337,500 gallons in 2002 to 22,905,000 gallons in 2008 (Shanken Communications, 2009).

Regulations & Legislation

Health Canada sets tight controls on the addition of caffeine to food and drinks- the addition of vitamins, amino acids and caffeine to alcoholic beverages is **not** permitted under the *Food and Drugs Act*. However a legal "loophole" exists whereby natural sources of caffeine are allowed in alcoholic beverages. The use of food ingredients that naturally contain caffeine such as chocolate, coffee and guarana are permitted for use in alcoholic beverages or mixtures. Alcoholic energy drinks in Canada are therefore permitted because the caffeine comes from a natural source (commonly guarana).

"Energy drinks are meant to supply mental and physical stimulation for a short period of time. They usually contain caffeine, taurine (an amino acid, one of the building blocks of protein), vitamins and glucuronoactone, a carbohydrate"

-Health Canada, 2010

Energy Drink Regulation in Canada (non-alcoholic)

Energy drinks are regulated as natural health products under the *Natural Health Product Regulations*. According to regulatory guidelines, bottles and cans of energy drinks must have warnings that state:

- No more than 500 milliliters of the product be consumed in one day
- They should not be mixed with alcohol
- They should not be consumed by children or pregnant women

*Health Canada has **not** approved the sale of any pre-mixed alcoholic energy drinks for sale. However, Canadian rules allow caffeine in alcoholic beverages if derived from such natural sources as guarana.*

*Guarana: a South American plant whose seeds and/or berries are used to produce a substance (guaranine) that is **chemically identical** to caffeine*

In response to the FDA's actions, some companies such as Phusion Projects, LLC, the maker of the popular 'Four Loko' drink, removed caffeine and other stimulants from its products.

In November 2010, the U.S. Food and Drug Administration (FDA) sent warnings to four beverage manufacturers indicating that the caffeine added to their alcoholic beverages was deemed an “unsafe food additive” and that further action, including seizure of their products, was possible under federal law. The action was taken in response to the published peer-reviewed literature on the co-consumption of caffeine and alcohol, consultations with experts in the fields of toxicology, neuropharmacology, emergency medicine, and epidemiology, and information provided by product manufacturers. The FDA felt that the evidence indicated that the consumption of beverages containing added caffeine and alcohol was associated with ‘risky behaviors’ that may lead to ‘hazardous and life-threatening situations’.

Researchers have declared that caffeinated-alcoholic beverages (and/or the combination of alcohol and high caffeine energy drinks) are a public health concern (Kaminer, 2010). The US Federal Trade Commission (FTC) had stated that there was a misperception that caffeinated alcohol beverages were safe for consumption since they were widely sold and available.

Key informants interviewed also made similar comments. Given that liquor stores in Atlantic Canada are provincially owned and operated crown corporations, there is often a perception that products, including caffeinated alcohol beverages, sold in these stores are automatically considered safe.

"I think the general population has a very naive view of paternalist Government and tend to say 'well, they wouldn't allow on the market if they weren't safe. I think this is an area where the regulators are completely asleep at the wheel"

"[People think] we wouldn't allow it if it wasn't safe [to be] sold in liquor stores."

(Key Informant Interviews)

Caffeinated Alcohol Beverages in Atlantic Canada

Product	Caffeine Source	Alcohol	Cost
Mojo Alternative Alcoholic Beverage + Guarana	Guarana	7% alc/vol	\$2.99-\$3.35 (per 330 ml bottle)
Rockstar + Vodka	Guarana	6.9% alc/vol	\$3.99-\$4.47 (per 473 ml bottle)
Rev Energy	Guarana	7% alc/vol	\$3.79-\$4.10 (per 473 ml)

Myths & Misperceptions

The myths and misperceptions surrounding the effect of alcohol and caffeine may be a contributing factor to the popularity of caffeinated alcoholic beverages (and/or the combination of alcohol and high caffeine energy drinks), particularly among youth and young adults.

Common myths and misperceptions regarding caffeinated alcoholic beverages (and/or the combination of alcohol and high caffeine energy drinks) include (Kaminer, 2010; Rohsenow & Howland, 2007):

- They serve as a remedy or can reverse the negative sedative effects of alcohol intoxication (this may stem from the myth surrounding the use of coffee to cure a hangover- Weldy, 2010)
- They increase motor control, thus allowing one to drive more safely
- They increase visual reaction time
- They will alter breath alcohol concentrations (caffeine has no effect on the metabolism of alcohol by the liver and thus does not reduce breath alcohol concentrations - Ferreira et al., 2006)

Caffeinated-alcoholic beverages (and/or the combination of alcohol and high caffeine energy drinks) leads to the "wide-awake-and-drunk" phenomenon

- Ferreira, 2006

The Impact of Consumption of Caffeinated-Alcoholic Beverages (and/or the Combination of Alcohol and High Caffeine Energy Drinks)

Prevalence of Consumption

Caffeinated-alcoholic beverages (and/or the combination of alcohol and high caffeine energy drinks) are particularly popular among young adults (17 to 30 years of age) with nearly a quarter having consumed a combination of alcohol and high caffeine energy drinks in the last month (O'Brien, 2008). A study of university students from Halifax (Nova Scotia) found that 67% deliberately mixed alcohol with energy drinks and 19% had done so in the previous week (Price et al., 2010). Other studies have found that, of those that mixed energy drinks and alcohol, close to half used more than three energy drinks per occasion (Malinauskas et al., 2007).

Drinking Practices & Drink Behaviour

Emerging research is revealing the impact of caffeinated-alcoholic beverages (and/or the combination of alcohol and high caffeine energy drinks) on drinking practices and behaviours. As previously noted, the co-administration of energy drinks and alcohol is particularly popular among youth and young adults as they are regularly consumed by 31% of 12-17 year olds and 34% of 18-24 year olds (Mintel International Group).

A single energy drink reduces the subjective feeling of alcohol intoxication (e.g., headache, weakness, dry mouth, impairment of motor control) without reducing actual alcohol-related impairment (Ferreira et al., 2006; Rohsenow & Howland, 2007). This correlation is of concern as research suggests that this may lead people to consume more alcohol than they would otherwise. For example:

- Price et al. (2010) found in a sample of university students from Halifax (Nova Scotia) that they drank significantly more alcohol when it was co-administered with energy drinks.
- O'Brien et al. (2008) found that college students who drink energy drinks were twice as likely to drink to a state of intoxication compared to those who consume alcohol alone.
- Thombs et al. (2010) found that those who co-administer alcohol and energy drinks were three times more likely to binge drink compared to those who consume alcohol alone.

Key informants also highlighted and expressed concern regarding the interactions between alcohol and caffeine noting the increased perceived sobriety in consuming these products despite actually being intoxicated. Perceptions of feeling less intoxicated means that people tend to drink more (e.g., binge drinking behaviour) than they normally would if they were consuming alcohol alone.

"When alcohol and caffeine are mixed, the combination masks the depressant effects of alcohol."

- Ferreira et al., 2010

"New, emerging research suggests a possible link between weekly or daily energy drink consumption and increased risk for alcohol dependence."

- Arria et al., 2011

"There seems to be a tendency for people to report feeling more sober when they mix [caffeine] with alcohol as well as for them to increase the amount of alcohol they ingested."

"[There is] evidence that mixing energy drinks with alcohol was a fairly common practice and that people would engage in binge drinking types of behaviours more frequently when they would mix alcohol with the energy drinks."

"People are mixing stimulants and alcohol, because stimulants seem to dampen the subjective sense of drowsiness, and they can [therefore] continue to drink longer and drink higher doses of alcohol."

"The products are designed for binge drinking. That's what their intended use is."

(Key Informant Interviews)

Injury & Risk Behaviour

Studies suggest that there is a higher dis-inhibiting effect in the combination of alcohol and caffeine compared to alcohol alone, which may increase risk behaviour and injury. For example, Arria et al. (2011) found that alcohol consumption in combination with energy drinks may reduce drinker's awareness of their level of intoxication/impairment and thus lead them to misjudge their ability to operate a motor vehicle safely. Contrary to popular belief, the addition of caffeine to alcohol does not enhance driving or sustained attention/reaction time performance relative to alcohol alone. Thombs et al. (2010) also found that bar patrons who consumed alcohol mixed with energy drinks were four times more likely to intend to drive upon leaving the bar. In a double-blind, placebo controlled study, Curry et al. (2009) found that combined consumption of alcohol and energy drinks impact neurophysiological status particularly in visuo-spatial/constructional and language performance scores. In other words, the physiological affects of combinations of alcohol and caffeine put one at greater risk for alcohol-related injuries.

Overall, evidence suggests that those who combine alcohol and energy drinks are more likely to (O'Brien, 2008; Donkin & Birks, 2007; Ferreira et al., 2006):

- Be **injured/physically hurt**
- Require **medical treatment**
- Ride with an **intoxicated driver**
- Increase their potential for **alcohol poisoning**
- Be victims or perpetrators of **aggressive sexual behaviour**
- Be involved in **violent** offending and victimization

Similarly, key informants identified the association between caffeinated-alcoholic beverages (and/or the combination of alcohol and high caffeine energy drinks) and increased risk behaviour and injuries. Key informants noted that the intoxication masking effects of these drinks often translates into people engaging in risk behaviours which may result in injury (e.g., falls, drowning, motor vehicle collisions, violence/fights, sexual assault, etc.). It was also noted that at high levels of alcohol intoxication, most people fall asleep or pass out; however, consumption of caffeinated-alcoholic beverages (and/or the combination of alcohol and high caffeine energy drinks) means people are more intoxicated and awake longer and thus more likely to engage in risk behaviours which could result in injury.

US News Headlines

"Former York Man, Sons Killed in Florida Crash- Hit by Driver Who Ingested 4 Four Lokos" – York Daily Record

"Found Near Stabbing Scene, Four Loko Worthy of Concern"
– State College

"Alcoholic Energy Drinks, Not Date-Rape Drugs, Linked to Roslyn Party Hospitalizations" – Washington State Office of the Attorney General

"Maryland Family Blames Four Loko Alcoholic Energy Drink for Daughter's Driving Death" – Fox News

"Drinks that Mix Alcohol and Caffeine Linked to Hospitalizations"
– NY Times

"...[there's] a tendency to report feeling more sober. The problem with this sense of clarity of mind is individuals who mix energy drinks with alcohol perform just as poorly as individuals who are just taking alcohol alone. [For example] people report feeling more sober, but they are just as impaired and so they were just as likely to get into an [motor vehicle collision] in driver simulation tests."

"... the drinker thinks they're not impaired when they actually are. [So do] drinking these products lead people to take bigger risks, they're awake and drunk – as opposed to asleep and drunk. To the extent that they're awake, they're more able to do [dangerous] things than they would be if they were asleep."

(Key Informant Interviews)

Lessons Learned from the United States

"We're really fortunate to have strong advocates among regulators - the National Alcohol Beverage Control Administrators. In this country we have two kinds of alcohol control: some controlled jurisdictions where the liquor is sold only by the State and others where the State licenses the sale of alcohol to private individuals. We have regulators who are not part of Attorney General (AG) offices, [we have] other non-profit organizations in the United States ...we can't deny their importance in pushing the envelope on safety. For example, the Marin Institute is very vocal and pushed the envelope ahead. Our State Alcohol and Drug Program, Department of Alcohol and Drug Program was interested in this issue and created a website on alcoholic energy drinks, which had articles and the science [to share] that information to the people around the country. ...[You need the support of] your health leaders, public health experts [as well as] credible scientists that can convince and bring on board the other professionals. ...experts needed to convey the significance of the literature and the data, I think that was really crucial."

(Key informant Interview)

It was noted by a couple of key informants that causal data between caffeinated-alcoholic beverages (and/or the combination of alcohol and high caffeine energy drinks) and injury/risk behaviours is only starting to emerge and thus, more research is needed in this area. However, the majority of informants strongly emphasize that it may be unwise to wait for this body of literature to develop as available correlational studies provide enough cause for immediate concern regarding these products. Further, it was suggested that collecting and compiling data and evidence should not fall solely on those working in academia but also from Public Health agencies as well as collaboration with advocacy organizations to ensure the issue remains prominent and heard by regulators and governments.

"...there's just not enough concrete evidence to say whether or not this is just correlated. So is it that energy drink users are more hazardous individuals in general or is there a causal link between mixing alcohol and energy drinks that make them more likely to get into problems? ... A lot of the information we have is correlational, so we have to be cautious, but also concerned."

"To me it's one of those things, do we wait to get the full evidence or do we just make some, I would say common sense policy decisions that just would say, [alcohol and caffeine] just isn't a good idea. Let's put some restraints on it as soon as we can."

(Key Informant Interviews)

Marketing of Caffeinated-Alcoholic Beverages (and/or the Combination of Alcohol & High Caffeine Energy Drinks)

Some experts suggest that the popularity of caffeinated alcoholic beverages among youth and young adults is due to the marketing strategies associated with these products. Some believe the alcohol industry is employing marketing tactics to specifically appeal to a younger audience (Simons, 2007; CMAJ, 2011):

- Marketing via youth friendly/popular media/mechanisms such as websites, Youtube, Facebook, etc.
- Making use of youth directed graphics (e.g., connected with extreme sports, clubs/parties, etc.) in product marketing
- Creating brand confusion with non-alcoholic energy drink counterparts

- Pricing caffeinated energy drinks below non-alcoholic versions (premixed alcohol energy drinks are more cost effective to purchase than alcohol and energy drinks separately)
- Marketing as alcoholic drinks that use energy drinks simply as an ingredient (e.g., Red Bull + Vodka)
- Youth-oriented packaging including large, colorful cans and bottles
- Masking the taste alcohol with “kid friendly” sweet, fruit flavor options

Imaging, claims, flavors and packaging used by pre-mixed caffeinated alcohol beverages available in liquor stores in Atlantic Canada

Product	Image	Claims	Flavors	Packaging
Mojo Alternative Alcoholic Beverage + Guarana		<ul style="list-style-type: none"> - “At 7% + guarana, Mojo is not your mother’s cooler” - “Guarana... contains 2.5 more caffeine than the coffee bean itself!” 	<ul style="list-style-type: none"> - Tropic fruit - Fruit punch - Strawberry & kiwi - Dragon fruit - Green apple 	<ul style="list-style-type: none"> - “Mojo comes in 330ml plastic bottles that are easy to hold with no breakage when you’re out tearing it up on the dance floor.” - “It can be bought individually or in 4-packs... it’s up to you”
Rockstar + Vodka		<ul style="list-style-type: none"> - “The bold taste you expect from Original Rockstar only we’ve turned up the volume by adding 6.9% premium vodka” 	<ul style="list-style-type: none"> - Original - Mango Orange 	<ul style="list-style-type: none"> - n/a
Rev Energy		<ul style="list-style-type: none"> - n/a 	<ul style="list-style-type: none"> - Original Rev - Rev Factor (cranberry & pomegranate) - Rev LoW (raspberry & citrus) 	<ul style="list-style-type: none"> - “New larger size – same great taste: Now enjoy original Rev in a single serve 473ml bottle” - “Rev comes in plastic bottles that are easy to hold with zero breakage when you’re out tearing it up on the dance floor”

Some key informants highlighted similarities to the marketing tactics used by tobacco companies to “target” a younger demographic such as sponsorship of youth/young adult events, etc.

“The marketing companies are doing pretty much the same thing that tobacco companies did 30 years ago. They’re targeting young population, they sponsor sporting events, and different types of concerts and types of events that appeal to youth.”

-Key Informant Interview

Key informants expressed concern regarding the marketing of caffeinated-alcohol beverages. As is documented in the literature, key informants highlighted marketing efforts which tend to favor young audiences such as advertising in youth-centric media, youth-friendly packaging (and packaging similar to non-alcoholic versions of energy drinks), product affordability, etc. Due to these youth focused marketing practices and the use of non-traditional mechanisms (e.g., online, etc.), many key informants felt that adults including parents, regulators, law enforcement and health care providers are generally unaware that these products are available and are being consumed by youth and young adults.

“There’s no doubt in my mind who [these products are] targeted to. [The industry will] deny this but, it’s very targeted to young people, teenagers and young adults. ...That’s part of the issue, people my age aren’t really on Facebook. [Adults] are not aware of those marketing pieces.”

“Sparks, marketed by Miller in [the US] was advertised in a magazine called ‘Blender’, which is a youth-oriented magazine. A magazine where young people are disproportionately in the reading audience; so that’s the indicator of marketing orientation. The packaging is certainly juvenile; it’s not something you’d find at a trendy [adult] establishments. [Pricing at] \$7.24; the alcohol content of about 20 beers for \$7 – it’s a pretty “good” deal.”

“Monster, Red Bull and other brands; put them side-by-side with the alcoholic version ...the color scheme, the patterns on the packaging are so similar, impossible to tell them apart unless you looked up close and then you might see it had percent alcohol”.

“...unless you are below a certain age, [adults] don’t even know about the existence of these products because they are not the subject of normal mass media ... for the demographic of 21-27 it is really all internet. It is web-based marketing, it is sponsorship of events on or near, as close as possible to college campuses”.

“It’s very targeted marketing to youth binge drinkers. The product itself is sweet, high alcohol, cheap- it hits all the keys [for youth]. You can get drunk for not too much money, it’s a product that goes down easy- it caters to youth tastes. It’s not a product that those 40 or older will be attracted to.”

“There are many signs that products are being targeted to young people. [For example] how they are mimicking the soft drinks –trying to capitalize on the popularity of the non-alcoholic energy drinks and using many of the same kind of marketing tools. Whether it was mimicking the packaging or using viral marketingusing social media, who’s online most of the time – the young people. ... adults had no clue what these products were because they weren’t being marketed through the usual, more traditional advertising channel that adults would view, like T.V. ”

“They don’t use traditional marketing- it’s all viral digital marketing, like getting the user groups going on Facebook and other social media which turned it in to a cult product and it’s all under the radar of parents, regulator and law enforcement.”

(Key Informant Interviews)

Strategies & Recommendations to Address Caffeinated Alcohol Beverages (and/or the Combination of Alcohol & High Caffeine Energy Drinks)

Regulations, Legislations & Bans

In the US, prior to the November 2010 FDA warning letters to manufacturers of caffeinated alcoholic beverages, work had been done by individual States to address this issue to ban their sales. In 2008, 13 State Attorneys General and the San Francisco City Attorney negotiated settlements with two caffeinated alcohol beverage producers who agreed to remove all stimulants from their products (California Department of Alcohol and Drug Programs). In 2008, a settlement was also reached between the Anheuser-Busch Company and State Attorneys in 11 states to stop the manufacture and sale of caffeinated alcohol beverages (State of Idaho- Attorney General, 2008).

As previously noted, “Health Canada has not approved the sale of any pre-mixed alcoholic energy drinks for sale”. However, Canadian rules allow caffeine in alcoholic beverages if derived from such natural sources (e.g., guarana). Provincial liquor commissions/boards in Canada have the authority to implement and regulate natural sourced caffeine in alcoholic drinks. For example, the Liquor Control Board of Ontario does not permit more than 30 milligrams of naturally occurring caffeine per service in alcoholic drinks. Generally, individual provinces have done little in the way of banning or creating legislation to address the sale of caffeinated alcohol beverages. However, after the US FDA’s actions, Canadian leaders such as Federal Health Minister Leona Aglukkaq are suggesting that there is a need to close legal loopholes associated with alcoholic beverages with naturally derived sources of caffeine.

When asked what recommendations key informants had to address this issue, a consistent, clearly identified suggestion was the banning of pre-mixed caffeinated alcohol beverages. Key informants felt that immediate action is needed to address and close legal loopholes which permit these products to be on the market. It was noted that addressing the legal loophole is not meant to ban products such as coffee liqueurs but rather address products in which there is the intentional addition of high concentrations of a stimulant for marketable purposes (regardless of the source of the stimulant).

Many provinces allow the “naturally sourced caffeine” legal loophole as it allows for the sale of chocolate or coffee based liqueurs.

“ [Addressing the] loopholes. ... The ones that have been the real concern, it’s not a matter of a by-product of a flavouring in a small amount, it is the intentional addition of caffeine as caffeine where it is part of the profile of the beverage.”

“The first thing for Canada, you’ve got to get the caffeine out of them, you got to get the premixed drinks off the shelves.”

“...[we’re looking at] should we be allowing the sale of alcohol products that have caffeine added to them in Nova Scotia.”

(Key Informant Interviews)

Further, key informants felt that a strategy was needed to address the mixing of energy drinks and alcohol. Key informants from the US also highlighted work to incorporate education regarding the potential dangers of mixing alcohol and energy drinks into the curriculum of bartender's training. It was also recommended that this issue be addressed via a ban on the sale of energy drinks in licensed establishments which serve alcohol as well as at liquor stores. Although key informants recognized that people could still easily buy energy drinks at grocery stores, etc. and mix them with alcohol, it was believed that limiting access to energy drinks in bars, clubs, pubs, etc. would be a positive first step to curbing access and thus the ability to mix alcohol and energy drinks in these venues. Key informants felt this recommendation might help curb energy drink and alcohol mixing in bars among young adults of legal drinking age but this would have little impact on underage drinkers co-administering these products. Therefore, it was suggested (and is being explored by Nova Scotia and Prince Edward Island) that provinces consider banning the sale of energy drinks to those under the age of 19.

"The one thing that I'm hopeful will happen is that the energy drinks will be banned in establishments that serve alcohol. That's a real problem right now, so you go into some of these nightclubs, they don't mix the drinks for the individual but they'll sell you a can of Red Bull and a shot of vodka. [A ban would make] it more difficult for consumers to engage in this potentially risky behaviour. ...there's no reason why a bar should be selling someone a Red Bull and a vodka on the same tab."

"I think that a good step would be to ban the sale of products that are deemed unsafe by Health Canada to be mixed with alcohol ... [so] removing the energy drinks from establishments that sell alcohol."

"Should we be allowing the sale of energy drinks where alcohol is being sold? When you look at an energy drink product, it clearly says on the label, 'should not be used with alcohol'. Some bars have these shooters set up where you can buy a can of Red Bull and a shooter of Tequila. [A ban, I would] put that forward as a policy recommendation for Government to consider."

"In terms of the bars, we're working on getting into their responsible beverage service programs and curriculum and adding a section on alcohol and caffeine mixing."

"I can see restricting the sale [of energy drinks] to youth on the basis of recommended standards of what are appropriate levels of caffeine for youth to be consuming, Health Canada has recommendations about how much caffeine a child should be taking, if these products are outside of the range of what's considered safe, I can see some rationale of restricting them. "

(Key Informant Interviews)

Alcohol Strength

Key informants from the US caution that simply removing the caffeine from these products is not a "cure all" for this issue. It was noted that in the US, these products are sold in oversized cans/bottles and contain very high levels of alcohol (in some cases the equivalent of five cans of beer in a single serving).

It was believed that people drink these high alcohol concentration products believing them to be “safer” with the caffeine removed. The risk of over consumption, and binge drinking and injury continues to be a problematic issue associated with these products.

States such as Montana have worked to re-classify caffeinated alcoholic beverages products as “liquor” (rather than current classifications as beer) which places limits on the locations where these products can be sold.

-Montana Code Annotated

“They’ve removed the caffeine but still have close to five standard serving-sized drinks. ... So we have a new problem on our hands which is what we call the ‘super-sized alco-pop’. We used to worry about alco-pops that came in 12 ounce bottles and now we’re worried about 23 and a half ounce cans.”

“They’ve now re-formulated [these products and removed the caffeine], it’s no longer ‘black-out in a can’, now it’s ‘binge in a can’, because it’s in the same size packages with the high alcohol content. People think that now the caffeine is gone, that it’s not dangerous anymore.”

“An issue I would suggest for you folks in Canada to try to address- if you’re going look at what’s happening with alcoholic energy drinks, also [also look at] the supersize issue. [In the US] last year it was alcoholic energy drinks, this year it’s supersize “Binge In A Can”.

(Key Informant Interviews)

Marketing & Messaging

Several key informants noted that the marketing of these products needs to be examined as it is believed to be a large contributing factor to the drinks’ popularity among youth and young adults. Key informants felt that work to address youth directed marketing and alcohol related harms in general could be applied to caffeinated alcohol beverages (and/or the combination of alcohol and high caffeine energy drinks). However, key informants caution that messaging which highlights the negative effects of these drinks may actually encourage youth/young adults to choose them. For example, it was noted that education regarding the intoxication masking effects of these products may be perceived by youth/young adults as a method allowing them stay awake longer and increase their ability to consumer more alcohol.

“The marketing is so targeted to young people... Four Loko and Joose have created a cult product. Word got out that these products are dangerous and that’s part of their marketing. They are targeting an audience that’s looking for a risky product.”

(Key Informant Interview)

The screenshot shows a Facebook profile for 'Get Your Mojo Going...'. The page includes a cover photo of four colorful cans of Mojo drinks. The 'Basic Info' section lists the name, category (Common Interest - Food & Drink), and a description: 'A group dedicated to MOJO, the Alternative Alcoholic Beverage and for all the MOJO lovers out there. At 7% alc/vol + Guarana, MOJO is not your mom's cooler.' It also lists five flavors: Star Fruit, Dragon Fruit, Tropic Fruit, Fruit Punch, and Green Apple. The 'Contact Info' section provides an email address (info@drinkmojo.ca), a website (http://www.drinkmojo.ca), and an office location (Blue Splice Beverages). The 'Recent News' section includes a post from August 2007 about launching Mojo in Ontario and another about a beer fest.

Online Alcohol Marketing

“Despite Facebook’s Alcohol Advertising Guidelines requiring age restrictions on alcohol ads, pages and applications, content promoting alcohol and dangerous drinking on Facebook is accessible to users of every age.”

- The Journal of Global Drug Policy & Practice

Public Awareness

Although key informants recognized that policy changes have a greater impact than public education, it was believed that some public awareness building is needed regarding caffeinated alcohol beverages (and/or the combination of alcohol and high caffeine energy drinks). Given the general lack of awareness of the availability of these products among adults, it was felt that some basic awareness strategies were required to highlight the issues and concerns associated with these products.

"There's certainly some room within the general population to recognize that mixing caffeine with alcohol is not going to make you more sober, it might make you feel more alert, but you're going to perform just as poorly. "

"We found that most adults didn't even know that these beverages were alcoholic. ... Most adults did not know that these products existed and that they contained alcohol. So they certainly didn't know about the dangers of [these products]. We are hearing from a number of people, [like] parents who found a beverage like this in their kids bedroom, and didn't realize that it contained alcohol."

(Key Informant Interviews)

Some States are working to make labelling mandatory (fully disclose amounts of caffeine and other ingredients).

Ordinances have been enacted requiring some California retailers to post signs warning of the risks of caffeinated alcohol beverages.

*- City of Thousand Oaks, CA.
Ordinance*

Warnings & Product Labelling

A few key informants spoke of the use of warning signs in licensed establishments cautioning of the dangers of mixing alcohol and energy drinks. However, it was believed that warning signs would have little effect and key informants favoured previously described changes such as banning the sale of energy drinks where alcohol is served. Further, a few key informants felt that labelling energy drinks with warnings against mixing with alcohol was positive, but once again, this would not have the same impact as policy changes. It was believed that labelling is particularly ineffective in the case of these products as younger audiences tend not to read labels. There were also expressed concerns that warning labels could simply entice the consumption of the products among youth.

"[Bar tenders] can mix it in the U.S. and they only thing that we're doing about that, at least one jurisdiction is having warning sign ordinances requiring that establishments put up a warning sign wherever caffeine and alcohol are being mixed."

"We started seeing bigger type, 'contains alcohol'. ... [but] labelling is a very ineffective way of changing youth [behaviour], they're not going to read the label."

(Key Informant Interviews)

WARNING:

Consuming energy drinks that contain or are mixed with alcohol may mask the signs of impairment and

**INCREASE YOUR RISKS
OF INJURY**

Health Care Provider & Other Professionals' Awareness

All key informants indicated that awareness of the risks associated with caffeinated alcohol beverages (and/or the combination of alcohol and high caffeine energy drinks) among health care providers was low. It was recommended that addressing this issue would require similar approaches as is used for alcohol in general, including screening and brief intervention training. It was also noted that other professionals such as educators and law enforcement are equally unaware of the availability and dangers of these products and thus, general awareness building is required to educate professionals about these products and the risks/issues surrounding them. It was noted that increased media/publicity surrounding these products has aided in increasing awareness among professionals and the general adult public.

"I don't think most health care professionals are aware of the rapidly changing products that are on the market. They certainly would be familiar with over-dosing on alcohol in general, but I doubt that most are aware of something like caffeine and alcohol induced products which are pretty new. "

"When we started this work, we would have audiences of law enforcement, parents, educators, that had never heard of these products. Many thought these products were just energy drinks. In the last 6 months there has been a big spike in awareness as a result of the publicity."

(Key Informant Interviews)

Based on the findings of the environmental scan, the following are some suggested recommendations to address caffeinated alcohol beverages (and/or the combination of alcohol and high caffeine energy drinks) on rates of injury and patterns of hazardous consumption:

Tier 1 Recommendations: Greatest potential impact informed by the literature

- Support and advocate for actions to **address/close legal loopholes** which permit the sale of alcoholic products with high levels of naturally sourced caffeine.
- Advocate for provincial liquor commissions to set **limits on how much naturally derived caffeine is permitted** in pre-mixed alcohol beverages.
- **Remove energy drinks** from being sold in provincial liquor stores.
- Actively **monitor alcohol content** of caffeinated alcohol beverages to ensure they do not include excessive/high levels of alcohol in a single serving (also monitor serving sizes).
- Support work underway provincially to restrict the sale of energy drinks to those under the age of 19 years.
- Support appropriate **drink prices** and restrictions on discount drinks of caffeinated alcohol beverages (and/or the combination of alcohol and high caffeine energy drinks).

Tier 2 Recommendations: Effective only after, or in concurrence with the first tier recommendations

- Explore inclusion of the dangers of combining alcohol and high caffeine energy drinks into **bartender's training/curriculum**.
- Develop **public education campaigns** as a support to policy change that are targeted at adults (e.g., parents, injury prevention practitioners, health care providers, law enforcement, educators, etc.) to build awareness of the availability of these products and the risks associated with their consumption. Public education campaigns are integral to building public support for policy change by stimulating dialogue and debate on what should be done. Posting **warning signs** in licensed establishments which sell energy drinks and alcohol to discourage the mixing of these products, targets the bar environment and could be an effective mechanism to promote debate.
- Develop a **media advocacy strategy** to promote public debate and support for policy interventions. The focus of a media advocacy strategy is on policy, rather than educating the public about risks and seeking individual behaviour change.

- Although increased awareness does not necessarily lead to changed behaviour, particularly among youth/young adults, the development of **strategic messaging** regarding these products should be supported. Messaging should focus less on effects such as the increase in levels of intoxication associated with consumption of these products, etc. (which might actually appeal to youth/young adults) but rather undesirable risks and harms such as sexual assault, violence, etc.
- Develop campaigns that educate youth and inform adults on the **marketing and advertising practices** used to entice consumption of these products (e.g., targeted online viral advertising, packaging designed to appeal to younger audiences, etc.).

Call for Further Research

- Support **ongoing research** examining the effects of caffeinated alcohol beverages (and/or the combination of alcohol and high caffeine energy drinks) on rates of injury and patterns of hazardous consumption to continue to build evidence in this area.

The preceding report presents the findings of an environmental scan conducted to explore the impact of caffeinated alcohol beverages (and/or the combination of alcohol and high caffeine energy drinks) on rates of injury and patterns of hazardous consumption. Although these products are relatively new to the marketplace and the associated research is still in its early stages, the evidence and expert opinions of key informants highlight the serious safety concerns linked to caffeinated alcohol beverages (and/or the combination of alcohol and high caffeine energy drinks). The literature and experts consulted as part of this environmental scan suggest that a proactive approach is needed to address this issue (rather than a reactive approach as research continues to emerge regarding the harms and risk of injury associated with these products).

The marketing of these products is heavily directed towards younger audiences and promotes an unhealthy/unsafe culture of alcohol consumption. These products have emerged quickly and under the radar of many stakeholders (e.g., regulators, health care professionals, law enforcement, educators, parents, etc.) such that basic public education regarding the availability of these products and associated harms/concerns is needed. This issue has recently received a great deal of attention in light of actions by the US FDA to curb the sale and consumption of products which they have deemed “unsafe”. Key experts, particularly from the US, felt that Canada is at an advantage and is well positioned to address this issue given the government ownership and operation of much of the liquor sold. It is incumbent upon governments of Atlantic Canada to take action on this issue, particularly tightening regulatory controls which permit the sale of these products.

A Call to Action

“The available research suggests that alcoholic energy drinks create a dangerous mix. ...Action is needed from both the alcohol industry and from governments at all levels. Alcoholic beverage producers should discontinue the production of alcoholic energy drinks pending further scientific study that demonstrates the products’ safety, particularly for young people. The federal government should conduct investigations into the marketing of these products, conduct research to determine any link to both short- and long-term health problems, particularly young people, and initiate a public information campaign to alert consumers, parents and law enforcement to the risk associated with mixing alcohol and energy drinks. State and local governments should not wait for federal action and should initiate their own investigation, research and public information campaigns. Community groups, parents, law enforcement agencies, and citizens also need to take action, calling for industry marketing reforms and government action.”

- Simon & Mosher, 2007

Arria, A.M., et al (2011). Energy drink consumption and increased risk of alcohol dependence. *Alcoholism: Clinical & Experimental Research*; 35(2), 1-11.

Agriculture and Agri-Food Canada (2008). Market Brief: The Canadian Energy Drink Market. *Agri-Food Trade Service*
California Department of Alcohol and Drug Programs. Alcoholic energy drinks. Available at:
http://www.adp.ca.gov/youth/aed_index.shtml

Canadian Medical Association Journal [CMAJ] (2011). United States Food and Drug Administration signals crackdown on caffeinated alcohol drinks. *CMAJ*, 183(1); E47-E48.

City of Thousand Oaks, CA. Ordinance No. 1528-NS, enacted November 17, 2009.

Curry K, Stasio MJ (2009). The effects of energy drinks alone and with alcohol on neuropsychological functioning. *Hum Psychopharmacol*; 24(6):473-81.

Donkin S., & Birks, D.J. (2007). Victims and offenders of night-time economy violence. London: UCL Jill Dando
Institute of Crime Science

Ferreira S.E., De Mello M.T., Pompela S., et al. (2006). Effects of energy drink ingestion on alcohol intoxication. *Alcohol ClinExp Res*; 30:598-605.

Howland et al. (2011). The acute effects of caffeinated versus non-caffeinated alcohol beverage on driving performance and attention/reaction time. *Addiction*, 106(2); 335-341.

Kaminer, Y. (2010). Problematic Use of Energy Drinks by Adolescents. *Child & Adolescent Psychiatric Clinics of North America*; 19(3), 643-650.

MacDonald, N., Stanbrook, M. & Hebert, P (2010). "Caffeinating" children & youth. *CMAJ*

Malinauskas, B.M., Aeby, V.G., et al. (2007). A survey of energy drink consumption patterns among college students. *Nutr J*, 6; 35.

Mintel International Group Ltd. (2007) Energy drinks. Chicago, IL: Mintel International Group Ltd
Montana Code Annotated § 16-1-106 (8).

Mosher, J. (2010). Caffeinated Alcohol Beverages: State, local and college actions to restrict or ban their availability. *Alcohol Policy Consultations*

O'Brien MC, McCoy TP, Rhodes SD, et al. (2008). Caffeinated cocktails: energy drink consumption, high-risk drinking, and alcohol related consequences among college students. *Acad Emerg Med*;15(5):453-460.

Price, S.R., Hilchey, C.A., Darredeaux, C., Fulton, H.G, & Barrett, S. (2010), Energy drink co-administration is associated with increased reported alcohol ingestion. *Drug and Alcohol Review*, 29; 331-333.

Rohsenow, D.J. & Howland, J. (2007). Caffeinated alcohol beverages: Attractive misunderstood danger for young adults. *Brown University Center for Alcohol & Addiction Studies*.

Shanken Communications, Inc. (2009). The U.S. beer market: impact databank review and forecast, p. 533. New York, NY: M. *Shanken Communications, Inc.*

Simon M. & Mosher J. (2007). Alcohol, energy drinks, and youth: A dangerous mix. San Rafael, CA: *Marin Institute*.
State of Idaho Office of Attorney General Lawrence Wasden (2008).

Thombs DL, O'Mara RJ, Tsukamoto M, Rossheim Me, Weiler RM, Merves ML, Goldberger BA.(2010). Event-level analyses of energy drink consumption and alcohol intoxication in bar patrons. *Addictive Behaviors*, 35;325-330.

US Federal Trade Commission (FTC) (2010). FTC sends warning letters to marketers of caffeinated alcohol drinks.

Weldy, D.L. (2010). Risk of alcohol energy drinks for youth. *JABFM*, 23(4); 555-558