Primary Prevention of Harms Related to Substance Use:

Promising Practices

Centre for Addiction and Mental Health

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Table of Contents

What is primary prevention?

Prevention is a concept from the field of public health, referring to the development and application of measures to prevent disease.[1] Prevention measures are divided into three categories: primary, secondary, and tertiary. The World Health Organization defines these three types of prevention as follows: [1(p5)]

- *Primary* prevention is directed towards lowering the prevalence of risk factors common to a range of diseases in order to prevent the initial occurrence of a disorder, for example through behaviour change advice. It may also include actions that inhibit environmental, economic and social conditions known to increase these risks.

- *Secondary* prevention is directed towards early detection of existing disease with a view to arresting or delaying the progression of the disease and its effects, for example through screening and other early detection programs such as routine health checks.

- *Tertiary* prevention generally refers to disease management strategies and/or rehabilitation intended to avoid or reduce the risk of deterioration or complications from established disease, for example through patient education and physical therapy.

All three types of prevention are important. This document will focus on primary prevention. In a nutshell, **primary prevention is a public health strategy meant to prevent health harms *before they occur***. In the context of substance use, primary prevention seeks to prevent health harms from substance use by reducing associated risk factors and strengthening protective factors.

Why is it important?

"Substance use" refers to the consumption of psychoactive substances (drugs) like alcohol, cannabis, cocaine, opioids, psychedelics, and tobacco / nicotine. A majority of adults, and many adolescents, use substances in some form (see Figure 1 for substance use among Ontario high-school students).[2]

Figure 1: Past-year substance use among Ontario high-school students, 2023 [2*]

	Total	Males	Females		G7	G8	G9	G10	G11	G12	
Grades 7–12											
Alcohol	35.6	32.7	38.6	*	6.9	14.6	25.1	43.0	48.1	60.7	*
Prescription Opioid Pain Relievers (NM)	21.8	18.0	25.8	*	22.5	22.2	22.5	20.2	21.4	21.9	
Cannabis	17.6	14.8	20.7	*	s	5.4	8.9	21.8	25.7	34.0	*
Vapes/Electronic Cigarettes	13.4	9.4	17.7	*	s	5.0	9.1	16.7	19.1	21.8	*
Cough/Cold Medication (NM)	9.6	10.4	8.7		13.4	13.6	8.6	9.2	7.9	6.8	*
Tobacco Cigarettes	3.2	3.0	3.5		s	s	1.4	2.8	6.1	6.5	*
Waterpipes (Hookahs)	2.1	2.3	1.9		s	s	s	2.9	3.4	3.0	*
ADHD Drugs (NM)	1.9	2.1	1.6		s	1.9	1.8	2.1	2.1	2.0	
Smokeless (Chewing) Tobacco	1.7	2.3	0.9	*	s	s	s	s	s	2.9	*
Grades 9–12[††]											
Mushrooms (Psilocybin) or Mescaline	3.4	3.8	3.0		--	--	1.3	3.4	3.6	5.1	*
Tranquillizers/Sedatives (NM)	1.7	1.2	2.1		--	--	1.6	1.5	s	1.8	
Cocaine	1.0	1.1	0.8		--	--	s	s	s	0.8	
LSD	0.9	1.1	0.7		--	--	s	s	s	1.0	
Ecstasy (MDMA)	0.6	0.5	0.7		--	--	s	s	s	0.7	
Any NM Use of a Prescription Drug	22.9	18.7	27.2	*	--	--	23.4	21.7	23.2	23.2	
Any Drug Use	29.3	27.3	31.4	*	--	--	28.9	29.4	28.9	29.9	

* statistically significant difference (p<.05), not controlling for other factors; s=estimate suppressed due to unreliability; estimate for alcohol excludes "a sip"; estimates for tobacco cigarettes and vapes/electronic cigarettes exclude smoking a few puffs; NM=nonmedical use, without a doctor's prescription; "Any NM Use of a Prescription Drug" is a composite measure defined as past year nonmedical use of opioids, Attention-Deficit/ Hyperactivity Disorder (ADHD) drugs, or tranquillizers/ sedatives; "Any Drug Use" is a composite measure defined as past year use of any one of 11 drugs (excludes alcohol, tobacco/ nicotine, and cannabis); methamphetamine, heroin, and fentanyl are not shown due to suppressed estimates.

Not all substance use is harmful, and reasons for use differ. However, there are significant impacts. The annual direct costs of substance use (healthcare, lost productivity, criminal justice, etc.) in Canada are estimated to be over $49 billion.[3]

More importantly, there are at least 74,000 substance-attributable deaths in Canada every year — over 200 deaths per day.[3] The drug poisoning crisis took more than 8,000 lives in 2023 alone.[4] Young people are especially affected: in some parts of the country, drug poisonings are the leading cause of death for people aged 10 to 24.[5]

Current strategies to address the harms of substance use generally have four dimensions or "pillars": prevention, treatment, harm reduction, and enforcement. This approach is illustrated in Figure 2, which is a visual representation of Canada's current drug strategy. In the case of the drug poisoning crisis, government responses have mostly emphasized treatment and harm reduction. Such measures are essential, but to date, they have not slowed this crisis.

Legal drugs too are associated with significant harms: alcohol and tobacco account for about 63% of substance-attributable costs and 85% of substance-attributable deaths.[3] Here too, young people are affected. The human brain continues to develop up until about age 25, and use of substances like alcohol and cannabis during that time — especially in early adolescence — is linked to deficits in neurodevelopment and a range of negative outcomes such as low levels of educational attainment, higher likelihood of developing substance use disorder, and increased risk of developing mental health problems.[6] For these

reasons, delaying the onset of substance use, or reducing frequency or intensity of use, are common goals of primary prevention efforts.

Figure 2: A four-pillar approach to substance use [7]

PREVENTION	TREATMENT	HARM REDUCTION	ENFORCE-MENT
Preventing problematic drug and substance use	Supporting innovative approaches to treatment and rehabilitation	Supporting measures that reduce the negative consequences of drug and substance use	Addressing illicit drug production, supply and distribution

SUPPORTED BY A STRONG EVIDENCE BASE
To better identify trends, target interventions, monitor impacts and support evidence-based decisions

An important concept in public health is that of "upstream" versus "downstream" interventions. This concept was developed in the 1970s through the metaphor of a health worker who comes across people drowning in a river and, while rushing to treat them, begins to wonder why people are falling into the river in the first place.[8] It has gained broad acceptance in the public health field as a way to differentiate between interventions focused on immediate health issues at an individual or clinical level (downstream) and those aiming to tackle the underlying social, economic, and environmental factors contributing to health issues in the first place (upstream). It also is featured in CAMH's strategic plan for 2024–2030: the second of three strategic directions is to "Get upstream to prevent and change the course of mental illness."

In the context of substance use, treatment and harm reduction are downstream interventions.[*] They are essential components of a public health response to

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[*] Harm reduction is generally considered a form of tertiary prevention because it aims to reduce or mitigate harm that has already occurred or is expected to occur. In practice, there are harm reduction measures spanning the three types of prevention outlined above. For example naloxone distribution programs aim to reverse overdoses, which seems a clear example of tertiary prevention; at the other end of the spectrum, drug checking services might be framed as a form of primary prevention since they are intended to prevent harms from occurring at all. Harm reduction services are an essential part of any comprehensive drug strategy, but for the purposes of this discussion we will consider them to be in the tertiary prevention category, and thus out of scope.

substance-related harms. Still, there is a need to look upstream and design interventions intended to prevent harm from occurring in the first place.

In Canada, as in other high-income countries, primary prevention measures have historically had different objectives and levels of intervention. These include:[9]

- discouraging substance use through prohibition and criminal sanctions,

- reducing people's interest in substances / substance use through behavioural interventions, and

- limiting the accessibility of substances through regulations (e.g. on physical availability, price, and advertising / promotion).

The first type of intervention — prohibition and the criminalization of substance use — exacerbates the health harms associated with it and additionally creates social harms.[10,11]

The two other types of intervention correspond to the examples in the World Health Organization definition of primary prevention given above: 1) behavioural interventions, and 2) actions that inhibit environmental, economic and social conditions known to increase the risks of substance-related harm. This document will focus on those two types of primary prevention, with a particular emphasis on young people (up to 25 years of age).

Behavioural interventions

Behavioural interventions are designed to influence or modify individuals' attitudes and knowledge, and ultimately their behaviour. In the context of substance use (and young people specifically), the aim may be to encourage people to refrain from substance use, delay it, or shift to less risky types or patterns of use. The interventions themselves can have different types and settings.

- *Type*: Behavioural interventions can be aimed at an entire population (universal), or at those considered to be at risk (selective).

- *Setting*: Behavioural interventions can be offered in educational settings (K–12, college, university) or elsewhere in the community (workplaces, community centres, places of worship, etc.), or may be delivered via mass media or social media.

The interventions themselves can also vary a great deal. The most common forms are:

- Health education (providing information about risks and alternatives)

- Skills training (aimed at improving coping skills, life skills, or psychosocial development generally)

- Psychotherapeutic approaches, e.g. cognitive-behavioural interventions (CBT), motivational interviewing (MI)

Interventions can be offered in an individual or group context, and the group might be peers or family. Many of these interventions can also be technology-enabled; for example they might be offered virtually or via apps, chatbots, etc. Some explicitly address substance use, while others focus instead on broader life skills.

This variation makes behavioural interventions somewhat challenging to concisely define. It may be helpful to give hypothetical examples of interventions that combine the elements described above:

- A mass media campaign (TV commercials, ads online and on social media) conveying the harms of a specific substance, or substances in general, and encouraging people to refrain from using

- School-based skills training, which may or may not be part of curriculum, aiming to give young people insight into how they manage stress and how they respond to peer influences

- Community-based after-school programming (e.g. athletic or cultural activities) intended to give young people alternatives to using substances, either directly by giving them something else to do, or indirectly by strengthening their resilience and their relationships

- Family-based interventions designed to improve caregiver/child attachment and communication (and perhaps also parenting skills generally)

What works and what doesn't

Summarizing the effectiveness of different primary prevention interventions and programs is difficult. Not all programs have been evaluated; for those that have, evaluations vary a great deal in quality. Programs also differ in their desired outcomes. For example, a program may be aiming to achieve changes in attitude (e.g. perception of substances) or behaviour (e.g. no use, less use, or less risky use). Still, we can draw broad conclusions about the effectiveness of certain approaches. The following summary is drawn from two reports synthesizing the findings of over 100 systematic reviews.[9,12]

First, what does not work. On its own, health education — the provision of information about substances, in a classroom or media setting — is among the less effective harm prevention strategies when it comes to addictive substances and behaviours.[9,12–14] Education in the form of messaging that tries to persuade young people to refrain from substance use is particularly ineffective. For example, the Drug Abuse Resistance Education (DARE) Program, in which police officers visit schools and warn students not to use substances, was one of the most popular prevention programs in North America in the 1980s and 1990s. Of 14 evaluations of the program, only one found any evidence of a reduction in participants' substance use.[15] The provision of accurate health information by credible sources can play a supportive role in a broader strategy, as we will discuss later. But health education on its own is not considered an effective or sufficient primary prevention measure.

Now, what does work? Perhaps counterintuitively, interventions that specifically address substance use tend to be less effective than "generic" ones that focus instead on young people's skills, psychosocial development, and relationships.[16]

- For school-based interventions, evaluations have found reductions in initiation (tobacco), frequency and quantity of use (alcohol), and prevalence (illegal drugs). These interventions are especially effective when they include skills training (for example social competence and self-regulation) and/or CBT.

- For community-based interventions, evaluations have found reductions in initiation (tobacco, alcohol, illegal drugs). These interventions are especially effective when they include skills training for young people (for example social competence and self-regulation), and also for parents (for example training that improves parenting skills and parent-child relationships).

Below we describe two well-known primary prevention programs that have been evaluated and have shown good results. This is intended as illustration rather than endorsement.

Examples of promising practices

The Icelandic Prevention Model

The Icelandic Model for Primary Prevention of Substance Use, or Icelandic Prevention Model (IPM), has become well known as an example of a whole-community approach to prevention. Developed in the 1990s, its goal is to delay the onset of substance use and prevent early use. It is universal in the sense that it is aimed at an entire population — young people — rather than focusing on a subgroup of people deemed to be at higher risk. It is premised on the notion that "society is the patient," and the prescribed treatment is enhancing connections between young people and their families, peers, schools, and communities.[17]

This model is guided by five principles:[18]

1) *Enhance the social environment*. The IPM aims to address young people's initiation of substance use by altering the social environment, addressing underlying causes, and prioritizing community-wide intervention.

2) *Emphasize community action*. Focusing on neighborhoods, the IPM uses schools as hubs, with the goal of strengthening community connections and supporting child and adolescent health.

3) *Engage stakeholders through data.* The IPM relies on quick processing and dissemination of local data (community characteristics, substance use patterns, etc.) to inform decision-making.

4) *Employ an integrated team approach*. The IPM brings together researchers, policy makers, clinicians, and community members, in what is called a "team-science-to-practice approach."

5) *Match the solution to the scope of the problem*. Recognizing the complex causes of substance use, the IPM emphasizes a long-term approach, with realistic timelines and a long-term commitment (and funding).

Ultimately the IPM seeks to address the social context of substance use. It aims to reduce risk factors — and strengthen protective factors — in order to prevent harms and promote mental health.

Figure 3: Domains of community risk and protective factors in the Icelandic Prevention Model [18(p64)]
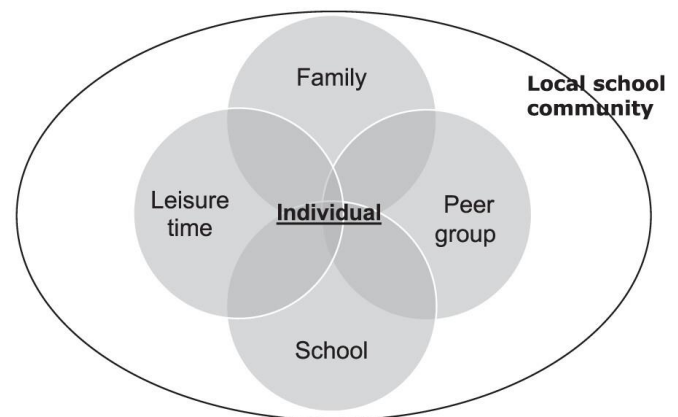
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The IPM has been extensively evaluated in Iceland, with municipalities that have consistently participated in the model since 1997 being compared to those outside the formal model. Evaluations showed significant differences in trends between the groups over time in terms of smoking and alcohol use, partying habits, parental supervision, and involvement in organized sports.[19] In addition, according to the model's creators, Iceland has become a European leader in reducing substance use since the model was implemented, with significant reductions in alcohol, cannabis, and tobacco use. Among the highlights (these data are from 2016):[18]

- The percentage of 10th-grade students in

Iceland who had ever smoked tobacco was 16%, compared to 46% in the rest of Europe

- Current alcohol use was 9% in Iceland, compared to 48% in the rest of Europe

- Lifetime cannabis use was 5% in Iceland, compared to 16% in the rest of Europe

Although this model is rooted in well accepted prevention principles and has been prominent in public discussions about preventing substance-related harms, much remains unknown about its core elements and their contribution to lowering the onset of substance use among youth.[20,21] Concerns have been raised about its transferability in particular, given that Iceland is a small country with a relatively homogeneous society.[21] But a few Canadian communities (for example Thunder Bay and Lanark County in Ontario) have recently started IPM pilot projects, and in 2023 the federal government announced a Youth Substance Use Prevention Program to support the implementation of IPM programs across Canada.[22]* The effectiveness of these programs will be evaluated, which should provide valuable insight into the impact they may have in preventing or reducing harms related to substance use.

PreVenture

PreVenture was developed in the 2010s in Québec. Its goal is to promote mental health and delay substance use. Unlike the IPM, it is a selective (not universal) intervention: it is aimed at adolescents aged 12 to 18 who are deemed to be at risk of harms from substance use. Also unlike the IPM, PreVenture is geared towards individual-level risk factors for early substance use rather than social or environmental factors.

PreVenture is premised on the notion that individual

differences in personality play a role in young people's substance use. It is designed to target four specific "personality risk factors": impulsivity, anxiety / sensitivity, hopelessness, and sensation-seeking.[23] It consists of two 90-minute sessions or workshops, which are run by trained facilitators and can be incorporated into school curriculum and be delivered in person or online. These sessions are designed to enhance protective factors: participants gain coping skills to deal with challenges, learn how to set long-term goals, and harness their personality traits towards achieving those goals.[24]

Figure 4: Factors addressed by the PreVenture program

Risk factor(s) addressed

- Individual and peers: early initiation of drug/alcohol use
- Individual and peers: sensation-seeking

Protective factor(s) addressed

- Individual and peers: coping skills
- Individual and peers: positive self-concept and self-efficacy

This image is reproduced from the European Union Drugs Agency [25]

There is a growing evidence base supporting the effectiveness of PreVenture. Evaluations in several countries, including several randomized control trials, have found:

- For alcohol, reduced frequency of use, lower odds of harm, delayed initiation [26,27]

- For illegal substances, reduced frequency of use, lower number of substances used [28]

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* The federal government has also promoted school-based prevention through its *Blueprint for Action*, which is intended to provide guidance to school communities wishing to strengthen their efforts to prevent substance-related harms among youth.[16]

- For tobacco, lower odds of use, lower intentions to use in the future [29]

- For substances generally, lower probability of developing a substance use disorder [30]

The program seems to have lasting effects, with some of these changes observed several years after participants have taken the sessions.

PreVenture has limitations as well. Barriers to implementing the program may include a lack of facilitators with the necessary skills (for example CBT) and a high cost of training and implementation.[25]

Other programs

In closing, we can mention two other examples of behavioural interventions that have shown good results.

Life Skills Training. In this program, teachers or trained facilitators deliver curriculum that includes misconceptions about substances, skills training (decision-making and problem-solving skills as well as social skills), and stress and anxiety management. A majority of evaluations have shown a reduction in substance use (alcohol, cannabis, illegal substances, tobacco) among its participants, and these may last up to 14.5 years after taking the program.[15]

Strengthening Families. This program is designed specifically for families facing challenges. Parents / caregivers and children participate in sessions both together and separately. Training includes parenting skills, children's social skills, and family life skills. The program has been found effective at preventing alcohol and cannabis use in the US and some Latin American countries, but not in Europe — raising questions about its transferability.[31]

While the programs described above are very different, they all have one important element in common: they focus on the antecedents of, and risk factors for, substance use. The majority also address protective factors, seeking to impart and enhance life skills (especially coping and decision-making) and to foster connections, whether at the community level, with peers, or with family.

Regulatory interventions

Regulatory interventions are intended to address the social and economic environment in which psychoactive substances are acquired and consumed. Unlike behavioural interventions, these measures are not directly aimed at the people using (or considering using) substances, but rather at the substances themselves and the environmental factors known to increase the risk of harm. There is a very strong evidence base in this area.

What works and what doesn't

The population-level drivers of legal substance-related harm are well known. Extensive research across the globe has demonstrated that the ease with which a substance can be obtained — where, when and by whom — has an impact on levels of consumption; in turn, consumption levels correlate with harm at the population level.[11,32]

Substance availability has many dimensions. For the purposes of this discussion, it includes the following: the price of a substance, the number and location of outlets where it can be sold and/or consumed, the hours of sale and service at those outlets, and the rules around whether and how the substance can be advertised and promoted. All of these elements are linked to patterns of consumption and harm. Using alcohol as an example:[33(pp8-9,13)]

- *Price*: Decreases in the price of alcohol are associated with increases in alcohol-attributable morbidity and mortality, lower

life expectancy and an increase in impaired driving and related injuries and fatalities.

- *Location (outlet density)*: The number of outlets selling alcohol in a specific geographic area or

  per capita is often referred to as outlet density. Studies have found associations between increases in outlet density and higher rates of consumption by youth, property crime, injuries, violent crime, assault, homicides and impaired-driving fatalities.

- *Hours of sale*: Extending the hours when alcohol is sold (for both on- and off-premise consumption) is associated with increases in motor vehicle accidents, assaults, violent crime and hospitalizations. Extensions of as little as one to two hours have been observed to result in these harms.

- *Advertising / promotion*: Exposure to alcohol marketing and sponsorship is associated with earlier initiation to drinking; it is also associated with increased consumption and harm — especially among young people. A 10% increase in alcohol advertising expenditure has been observed to result in a 0.3% increase in alcohol consumption.

Similar trends have been observed for tobacco — and for cannabis, where it is legal.[34,35] Overall, it is clear that increasing the accessibility and visibility of psychoactive substances, whether through lower prices, more physical availability, or advertising and promotion, leads to significant increases in harm to people and society. Young people are especially susceptible.

As part of its Global Action Plan for the Prevention and Control of Non-Communicable Diseases, the World Health Organization (WHO) developed a series of recommendations for policymakers.[36] Alcohol and tobacco were among the four "behavioural risk factors" for which it made recommendations, and the most important interventions were dubbed "best buys" — the policies deemed "the most cost-effective and feasible for implementation."[36,37] The best buys were:

- Raising prices (alcohol and tobacco)

- Restricting advertising (alcohol and tobacco)

- Controlling availability (alcohol)

- Requiring that products be sold in plain packaging with health warnings on labels (tobacco)

These policies, more detailed examples of which are in Figure 5, have all been found to reduce alcohol-and tobacco-related harms, and here too, there is emerging evidence that this is the case for cannabis.

Figure 5: Examples of effective regulatory interventions

Public health options	Examples of public health strategies and interventions	Theoretical assumptions and broad policy goals	Industry strategies addressed
Pricing and taxation policies	Alcohol excise taxes; minimum price; bans on price discounts and promotions; additional taxation on youth-oriented beverages	Increasing economic cost of alcohol relative to other commodities and to available income will reduce demand for alcohol by decreasing affordability of alcohol	Use of price promotions to increase sales and to promote higher amounts of drinking
Regulating physical availability	Restrictions on time, place, and density of alcohol outlets; minimum legal purchase age; government monopoly of retail sales	Reducing supply by restricting physical availability will increase effort to obtain alcohol, and thereby reduce total volume consumed as well as alcohol-related problems	The greater the number of places where alcohol products can be sold and consumed, the greater the profits from increased sales
Regulating alcohol marketing	Total ban; partial ban; age restriction on access to alcohol industry websites	Reducing exposure to marketing which normalizes drinking and links it with social aspirations will slow recruitment of young drinkers and reduce heavier drinking	Alcohol promotion stimulates brand loyalty and sales

This image is reproduced from Babor et al. [32(p94)]

As already discussed, young people, with their still-developing brains, are more vulnerable to the harms of substance use and thus more susceptible to being

negatively impacted by policies that reduce the price of legal substances or increase their availability or visibility. Conversely, young people are among those most likely to benefit from regulatory interventions.

We also know what regulatory interventions do not work. The industries that produce and distribute legal substances like alcohol, cannabis, and tobacco often resist regulations that would restrict how these substances can be sold or advertised, deploying strategies that include lobbying, legal challenges, and attempting to undermine science.[38,39] Instead, the industry tends to recommend measures that are focused on individuals: for example, marketing campaigns to promote "responsible consumption." This strategy benefits the industry as it shifts focus away from inherently risky substances and the marketing practices that seek to promote them. It enables a narrative according to which the responsibility for preventing substance use harms is on individuals, and they are to blame if harm occurs. These measures are ostensibly intended to reduce substance-related harms but are unlikely to do so, and may in fact do the opposite.[32]

By definition, the regulatory levers described above are not available for illegal substances. Whether some currently illegal substances would benefit from regulation is a matter of debate, and is outside of the scope of this paper.

Examples of promising practices

There are far more real-life examples of government regulation of psychoactive substances causing harm than having a positive impact. However, we can offer two examples of jurisdictions that recently implemented evidence-informed regulation and have seen benefits as a result.

Alcohol in Lithuania

Eastern Europe has traditionally had high levels of alcohol consumption and related harm. But over the past decade, there are numerous examples of Eastern European countries implementing effective alcohol control policies, with Lithuania the most dramatic example.[40]

Between 2015 and 2018, Lithuania implemented a series of alcohol policy measures including significant price increases, a ban on advertising, and restrictions on availability. The latter included increases to the legal minimum age (from 18 to 20) and reduced hours for retail sales. Together, these measures significantly reduced alcohol consumption, and are estimated to have prevented more than 1,000 deaths per year — a 3.2% decline in overall mortality.[41]

These regulatory interventions were also found to be associated with a significant reduction in total mortality rates in people aged 18 to 22.[42] In particular, the increased minimum age was linked to a reduction in total mortality rates among youth aged 18–19, although researchers were unable to demonstrate causality given the concurrent policy changes, especially the increase in price.[42] Either way, the full package of regulatory interventions reduced total mortality among young adults.

Finally, these measures reduced alcohol consumption per capita — which is the best predictor of alcohol-related harms — by around 0.8 litres.[43,44] Young people seem to be consuming less alcohol in general: while 13% of Lithuanian adolescents reported being alcohol abstainers in 2015, that figure increased to 21% by 2019.[45]

Lithuania's example reaffirms the life-saving potential of evidence-based alcohol policy. The measures it deployed are not difficult to implement from a technical standpoint, but can be challenging in terms of political will and public acceptance.

Cannabis in Québec

There is a strong and growing body of evidence showing that regular cannabis use in adolescence can seriously harm the developing brain. Regular cannabis use at an early age is associated with low levels of educational attainment, diminished life satisfaction, higher likelihood of developing cannabis use disorder, and increased risk of developing mental health problems.[46] Several studies have suggested that cannabis use before the age of 18 increases the risk of developing psychosis. More recently, a study found that cannabis use during adolescence (ages 12–19) was associated with over 11 times greater risk of psychotic disorder.[47] High-potency cannabis — that is, cannabis with a high concentration of tetrahydrocannabinol (THC), the main psychoactive component of cannabis — places users at higher risk of mental health problems than low-potency cannabis. This is especially pertinent since cannabis potency has greatly increased over time. Dried cannabis averaged around 3% in the 1980s and approximately 15% in the late 2010s.[48] Today, most dried cannabis legally sold in Ontario contains more than 20% THC, in addition to concentrates and extracts that are often well over 90% THC. Unfortunately, many Canadian adolescents and young adults are unaware of these risks[49,50] (see Figure 6).

Beginning in 2014, CAMH advocated for an evidence-informed model of cannabis legalization and regulation. Among its recommendations for the retail system were the following:[51]

1) *Establish a government monopoly on sales.* Control board entities with a social responsibility mandate provide an effective means of controlling consumption and reducing harm.

2) *Limit availability*. Place caps on retail density and limits on hours of sale.

3) *Curtail higher-risk products and formulations*. This would include higher-potency formulations and products designed to appeal to youth.

4) *Curb demand through pricing*. Pricing policy should curb demand for cannabis. It should also encourage use of lower-harm products over higher-harm products.

5) *Prohibit marketing, advertising, and sponsorship*. Products should be sold in plain packaging with warnings about risks of use.

6) *Clearly display product information*. In particular, products should be tested and labelled for THC and CBD (cannabidiol) content.

When the federal government legalized cannabis in 2018, it included strict regulations on advertising and promotion as well as packaging and labelling (recommendations 5 and 6 above). However, it left most aspects of the retail system to provinces and territories to regulate. As a result, there is a patchwork of regulations across the country. At one end of the spectrum, Alberta set a minimum age of 18 and has more than 700 privately-owned retail outlets for a population of about 4.4 million. At the other, Québec set a minimum age of 21 and has just over 100 government-owned retail outlets for a population of about 8.5 million.

Québec is one of a few provinces and territories with a government monopoly on sales, which by its nature tends to keep availability lower than private retail systems (recommendations 1 and 2 above). It is the only province that has meaningfully curtailed higher-risk products and formulations (recommendation 3). Although the federal government has banned the sale of products that might appeal to children, most provinces allow the sales of cannabis edibles in the form of sweets or confectionery (like gummies), dessert, or chocolate. Québec is unique in prohibiting those types of cannabis edibles. The province has also placed a cap on potency — products over 30% THC are not allowed.[52]

The cannabis industry opposes such regulations,

arguing that they simply push people to the illicit market.[53] However, there is no evidence that this is occurring in Québec, where legal stores' market share is similar to that of other provinces, and people seem broadly satisfied with the cannabis retail market.[54]

With less than a decade having passed since legalization, research that compares cannabis exposure and cannabis-related health outcomes across Canadian provinces is sparse. However, we can make a few observations based on research to date. People in Québec are less exposed to cannabis advertising than people elsewhere in Canada.[54] And while the province has seen modest increases in cannabis use since legalization, they are smaller than increases seen elsewhere in the country, and cannabis use remains lower in Québec than in any other province or territory.[54] Similarly, while cannabis use may have increased modestly among young people across the country, that increase was much lower in Québec, especially among people aged 18–20.[55]

Discussion

There is a range of behavioural interventions that can help reduce or prevent harms related to substance use. It would be beneficial for governments to fund a variety of such interventions — universal and selective, community-based and individual-focused — with an emphasis on programs that have been evaluated and are supported by evidence.

Figure 6: Raising awareness of the risks of substance use

Young Canadians may not be aware of the risks of cannabis use, and lower risk perception may be associated with increased use. Since cannabis was legalized in Canada, research has found:

- Some adolescents believe cannabis poses no risk at all to mental health, and some believe it to be useful for managing physical and mental health problems.[54–56]

- While enhancing public awareness of the health risks of cannabis was an objective of the Cannabis Act, the majority of young Canadians report having seen no educational campaigns or health messaging around cannabis harms.[56]

- Young people who have seen cannabis-related health messaging are more likely to be aware of health risks.[54]

- In provinces where the cannabis retail system is more commercialized due to looser regulations, this commercialization may be contributing to perceptions among young people that cannabis is low-risk.[56]

In this context, there is a need to increase public awareness of the risks of cannabis use. While health education alone is not an effective prevention strategy, clear and accessible information from trusted sources can allow people to make more informed decisions about their use. This information can be provided in school curriculum and through public education campaigns in all forms of media.

This is not only the case for cannabis. For example, this type of health education could serve as a counterpoint to the widespread marketing that promotes and glamourizes alcohol.[32] It could also be used to raise awareness of the risks of non-medical use of prescription medications or illegal drugs generally. However, such campaigns must be carefully designed, as some have had the unintended effect of making young people more curious about substance use.[9]

However, even these evaluated and evidence-informed behavioural interventions may meet with limited success unless they are supported by regulatory interventions. For example, it would be difficult to disentangle the success of the Icelandic Prevention Model from the alcohol policy environment in which it exists: Iceland has relatively rigorous alcohol regulations, with a government monopoly on sales, controls on physical availability and a minimum age of 20, for example. In a discussion of the potential transferability of the IPM, observers have noted that Iceland's strong national alcohol policy is a crucial, possibly necessary precondition of its claimed success.[21] Several provinces are in the process of expanding the availability and accessibility of alcohol, and such policies run counter to the goals of primary prevention and may in fact impede them.

A 2016 report synthesized the findings of previous systematic reviews of interventions intended to prevent substance-related harms among young people. It included both behavioural interventions and regulatory ones. Of all the interventions it examined, researchers concluded that only two had a "large meaningful benefit" at the population level in reducing negative outcomes from alcohol and tobacco use: raising the price, and banning or strictly regulating marketing.[9] Clearly, for primary prevention to work, governments must commit to implementing both behavioural and regulatory interventions with a proven track record of reducing substance-related harms.

Conclusion

Current strategies to address the harms of substance use generally have four dimensions or "pillars": prevention, treatment, harm reduction, and enforcement. Government efforts to address these harms tend to emphasize treatment and harm reduction. While these are essential components of a public health response to substance-related harms, there is a need to look upstream and design interventions intended to prevent harm from occurring in the first place. Primary prevention is a public health strategy meant to do exactly that. In the context of substance use, primary prevention seeks to prevent health harms from substance use by reducing associated risk factors and strengthening protective factors.

Evidence-based primary prevention strategies have been identified. There are behavioural interventions that have been shown to encourage young people to refrain from substance use, delay it, or shift to less risky types or patterns of use. These evidence-based interventions will be more effective when the social and economic environment in which psychoactive substances are acquired and consumed is carefully regulated — again, with measures informed by the evidence. We hope that this paper, and the promising practices it describes, will spur conversations about how we can prevent substance-related harm from occurring in the first place.

About CAMH

The Centre for Addiction and Mental Health (CAMH) is Canada's largest mental health teaching hospital and one of the world's leading research centres in its field. CAMH is fully affiliated with the University of Toronto and is a Pan American Health Organization / World Health Organization Collaborating Centre.

With a dedicated staff of more than 4,500 physicians, clinicians, researchers, educators, and support staff, CAMH offers outstanding clinical care to more than 38,000 patients each year. The organization conducts groundbreaking research, provides expert training to health care professionals and scientists, develops innovative health promotion and prevention strategies, and advocates on public policy issues at all levels of government.

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