


SPECIAL ARTICLE

Introducing the evidence-based population health tool of the Lower-Risk Cannabis Use Guidelines to Brazil

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Cannabis is the most commonly used illegal drug, and is associated with well-documented adverse health outcomes, both acute and chronic. Cannabis use prevalence in Brazil is lower than in high-use regions in the Americas (e.g., North America), but concentrated among young people. Frameworks for cannabis control are increasingly shifting towards public health-oriented principles, with some countries undertaking respective policy reforms. These frameworks require a continuum of population-level interventions (e.g., prevention and treatment) including targeted prevention of adverse health outcomes among users. In this context, and based on examples from other health fields, an international expert group developed the evidence-based Lower-Risk Cannabis Use Guidelines (LRCUG), originally for Canada, including a set of 10 recommendations based on systematic data reviews and expert consensus methods. The LRCUG form a scientific population-health prevention tool to reduce adverse public health impacts for broad application among cannabis users. In Canada, the LRCUG have been formally endorsed and are supported by leading national health organizations and government authorities within the continuum of cannabis interventions. As the LRCUG are being internationalized, this paper introduces the LRCUG's concept and content – including their original recommendations translated into Portuguese – to the Brazilian context as an evidence-based population-level intervention tool for uptake, dissemination, and discussion. Sociocultural adaptation may be required for meaningful implementation.

Keywords: Brazil; cannabis; health; policy; prevention; public health

Cannabis is the most commonly used illicit drug globally, with more than 200 million current users (estimated for 2010).¹ In the Americas, cannabis use rates and associated burden of disease (i.e., dependence) are highest in the North America region, where, in 2010, there were an estimated 32 million users (or 11% of the adult population), including < 2 million users (or 0.6% of the population) with dependence, translating into 276,000 disability adjusted life years (DALYs), mostly in the age group 15-29 years.^{2,3} These indicators are lower overall in Latin America (7-8 million users, or 3% of the adult population), with the highest continental levels in the Southern Cone region (e.g., Argentina, Chile, Uruguay), with 169,000 individuals with dependence (0.28% of the population) and 26,000 related DALYs.^{2,3} For Brazil, recent epidemiological data are limited, yet indicate that 2-3% of the general adult population and approximately 5-14% of secondary and post-secondary

students engage in current cannabis use.⁴⁻⁶ Survey data suggest that about one in three current cannabis users in Brazil qualify for dependence.⁷

While for decades, cannabis control has been predominantly prohibition-based in countries across the Americas, there has been a gradual but persistent shift in an increasing number of jurisdictions towards liberalization and a more public health-oriented policy approach in recent years.⁸⁻¹¹ Canada, the majority of the United States, Argentina, Chile, and Colombia are but a few jurisdictions which have implemented law-based medical cannabis use and access programs, as far back as almost 20 years ago.¹²⁻¹⁴ In Argentina, Mexico, and Jamaica, personal (non-medical) cannabis use is decriminalized; some jurisdictions, such as Jamaica, even permit limited personal growth. Finally, several U.S. states (various years since 2012), Uruguay (2013), and Canada (2018) have formally

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moved toward legalization of non-medical cannabis use and supply policy frameworks, within which recreational cannabis use and distribution is legally regulated.

Cannabis is a psychoactive compound with a well-documented variety of associated acute and chronic health risks (for a series of seminal reviews, see e.g.¹⁵⁻¹⁸). While the overall cannabis-attributable disease burden is lower than that of licit drugs like alcohol or tobacco, also because instances of direct cannabis-related mortality are rare, morbidity outcome risks exist in different domains.^{2,19} For example, cannabis use acutely impairs cognition, memory, and psychomotor control, and can lead to hallucinations or psychotic symptoms.^{15,20} Acute cannabis impairment is associated with an about twofold increase in risk of fatal or nonfatal motor-vehicle accident involvement, a risk further amplified when alcohol is involved.^{21,22}

There are associations with adverse mental health outcomes, including (approximately twofold) risks with schizophrenia and depression; however, the directional and causal nature of these is complex.^{15,23,24} Cannabis (marijuana) smoking is associated with pulmonary-bronchial problems, and may contribute to lung cancer.²⁵ Cannabis use can result in use disorder (e.g., dependence); while older epidemiological data estimated that less than one in ten cannabis users will develop dependence, more recent population-level data have found rates as high as 25-30%.^{26,27} Furthermore, cannabis use may negatively impact reproductive outcomes (e.g., newborn health) and cardiovascular health, as well as reduce social and educational attainment or performance among young people.²⁸⁻³⁰ The latter risks have been linked to possible adverse effects of intensive cannabis use on brain structure and functioning, though concrete evidence is limited or mixed.^{31,32}

While the above cannabis policy changes remain controversial, they indicate and are embedded within a liberalizing trend footed on overall increasingly public health-oriented thinking in psychoactive substance control options and strategies.³³⁻³⁵ Liberalization in itself, however, does little to help or improve public health outcomes, and the impacts of legalization policies on public health remain uncertain and will not be known definitively for some time.^{11,36,37} However, liberalization creates policy environments that provide the opportunity to implement measures and approaches to prevent or reduce adverse consequences associated with substance use that would otherwise be impossible in contexts of illegality. One such primary element or tool are regulations – for example, focusing on drug product quality or strength, access and availability, or pricing and taxing, all of which are standards established in alcohol and tobacco control and provided for legal cannabis use and distribution schemes.³⁸⁻⁴⁰

A population health approach to cannabis control and interventions moves away from a binary approach defined by “abstinence/good vs. use/bad” to a more refined approach in which general prevention has its place, yet where equal emphasis is put on reducing risks and harms among users along a continuum of interventions, targeted prevention, and treatment.⁴¹⁻⁴³ Next to system-level regulation, however, evidence consistently shows that individual substance use behaviors, and corresponding

choice-making by users, substantially influence related health – and, on the population level, public health – outcomes. Hence, informing and influencing individual users to make choices to lower substance use-related health risks, based on scientific evidence, constitutes an integral component for a public health approach.⁴⁴ Similar behavioral choice tools or approaches have been established in other areas of health, for example, through evidence-based guidelines for nutritional, occupational, cardiovascular, or sexual health.⁴⁵⁻⁴⁸ In the psychoactive substance use field, the prime example of such evidence-based tools are Low-Risk-Drinking Guidelines, which have been implemented – mainly in North America – as a population health tool towards reducing risky alcohol use and related harms.^{49,50}

Such targeted prevention is categorically easier, but also necessary to achieve public health goals, when the activity in question – here, specifically cannabis use – is legal rather than illegal.⁵¹ The overall prevalence of cannabis use (up to 25-40% of individuals aged 15-25 years^{52,53}), combined with its impending (and now current) legality in Canada, provided the primary impetus to develop an evidence-based, targeted health-risk reduction tool for those making the choice to use cannabis. This initiative was concretely boosted by initial evidence indicating various predictors of cannabis-related health harms as “modifiable” through user behavior or choices. On this basis, a multi-national team of preeminent addiction and health science experts conducted systematic data reviews (2016-2017) on cannabis use and health, focusing on user-modifiable factors for reduced adverse health outcomes. The resulting evidence was reviewed and quality-graded, and a set of 10 recommendations on how cannabis users may most effectively reduce the risks for associated health harms was developed by expert group consensus. The resulting Lower-Risk Cannabis Use Guidelines (LRCUG⁵⁴; see the Recommendations in English and Portuguese in Box 1) were initially published and launched in June 2017. Since then, the LRCUG have been formally endorsed by nationally leading addictions and health agencies in Canada, including the Canadian Centre on Substance Use and Addiction, the Canadian Council of Chief Medical Officers of Health, the Canadian Medical Association, the Canadian Mental Health Association, the Canadian Pharmacists Association, the Canadian Public Health Association, the Canadian Society of Addiction Medicine, the Centre for Addiction and Mental Health, and the Mental Health Commission of Canada. Furthermore, various practical “knowledge translation” products – for example, graphic-design posters for public display, brochures for users (including young people) and an evidence summary for health professionals – have since been developed, electronically and in hard copy, and distributed widely.^{55,56} In parallel, efforts towards international versions of the LRCUG have been developed. For example, an adapted and official version of the LRCUG for Uruguay – where non-medical cannabis use and supply are legal and regulated⁵⁷ – has been formally launched by the national drug control and cannabis regulation agencies.

While non-medical cannabis use is currently not legally permitted in Brazil⁵⁸ – and we do not seek to take explicit

Box 1 Recommendations of the Lower-Risk Cannabis Use Guidelines (LRCUG)

Recommendation 1: The most effective way to avoid any risks of cannabis use is to abstain from use. Those who decide to use need to recognize that they incur risks of a variety of – acute and long-term – adverse health and social outcomes. These risks will vary in their likelihood and severity with user characteristics, use patterns, and product qualities, and so may not be the same from user to user or use episode to another. **[Evidence Grade: None required]**

Recommendation 2: Early initiation of cannabis use (i.e., most clearly that which begins before age 16 years) is associated with multiple subsequent adverse health and social effects in young adult life. These effects are particularly pronounced in early-onset users who also engage in intensive and frequent use. This may be in part because frequent cannabis use affects the developing brain. Prevention messages should emphasize that, the later cannabis use is initiated, the lower the risks will be for adverse effects on the user's general health and welfare throughout later life. **[Evidence Grade: Substantial]**

Recommendation 3: High THC-content products are generally associated with higher risks of various (acute and chronic) mental and behavioral problem outcomes. Users should know the nature and composition of the cannabis products that they use, and ideally use cannabis products with low THC content. Given the evidence of CBD's attenuating effects on some THC-related outcomes, it is advisable to use cannabis containing high CBD:THC ratios. **[Evidence Grade: Substantial]**

Recommendation 4: Recent reviews on synthetic cannabinoids indicate markedly more acute and severe adverse health effects from the use of these products (including instances of death). The use of these products should be avoided. **[Evidence Grade: Limited]**

Recommendation 5: Regular inhalation of combusted cannabis adversely affects respiratory health outcomes. While alternative delivery methods come with their own risks, it is generally preferable to avoid routes of administration that involve smoking combusted cannabis material (e.g., by using vaporizers or edibles). Use of edibles eliminates respiratory risks, but the delayed onset of psychoactive effect may result in the use of larger than intended doses and subsequently increased (mainly acute, e.g., from impairment) adverse effects. **[Evidence Grade: Substantial]**

Recommendation 6: Users should avoid practices such as “deep inhalation,” breath-holding, or the Valsalva maneuver to increase psychoactive ingredient absorption when smoking cannabis, as these practices disproportionately increase the intake of toxic material into the pulmonary system. **[Evidence Grade: Limited]**

Recommendation 7: Frequent or intensive (e.g., daily or near-daily) cannabis use is strongly associated with higher risks of experiencing adverse health and social outcomes related to cannabis use. Users should be aware and vigilant to keep their own cannabis use – and that of friends, peers, or fellow users – occasional (e.g., use only on 1 day/week, weekend use only, etc.) at most. **[Evidence Grade: Substantial]**

Recomendação 1: A maneira mais eficaz de evitar qualquer dano relativo ao uso de cannabis é se abster do uso. Aqueles que decidam usar devem reconhecer que estão propensos a uma variedade de riscos de saúde e sociais, os quais podem ser tanto agudos como de longa duração. Estes riscos variam em probabilidade e gravidade, de acordo com as características do usuário, padrões de uso e qualidade do produto. Portanto, podem não ser os mesmos de usuário para usuário ou entre um episódio e outro. **[Grau de Evidência: Não exigido]**

Recomendação 2: O início precoce do uso da cannabis (isto é, mais especificamente o uso que se inicia antes dos 16 anos) está associado a múltiplos efeitos adversos tanto de saúde quanto sociais na vida adulta jovem. Esses efeitos são particularmente pronunciados entre usuários de início precoce que também adotam um padrão de consumo intensivo e frequente. Isto pode ser causado, em parte, porque o uso frequente de cannabis afeta o cérebro em desenvolvimento. As mensagens de prevenção devem enfatizar que, quanto mais tarde for iniciado o uso da cannabis, menores serão os riscos de efeitos adversos para saúde e bem-estar geral do usuário ao longo de sua vida. **[Grau de Evidência: Substantial]**

Recomendação 3: Os produtos com alto teor de THC estão geralmente associados a maiores riscos de diversos problemas (agudos e crônicos) mentais e comportamentais. Os usuários devem conhecer a natureza e a composição dos produtos de cannabis que utilizam e, idealmente, utilizar produtos de cannabis com baixo teor de THC. Dada a evidência dos efeitos atenuantes do CBD em alguns desfechos relacionados ao THC, é aconselhável o uso de cannabis que contenha uma maior proporção de CBD para THC. **[Grau de Evidência: Substantial]**

Recomendação 4: Revisões recentes sobre canabinoides sintéticos indicam efeitos adversos à saúde acentuadamente mais graves e agudos relacionados ao uso desses produtos (incluindo casos de morte). O uso desses produtos deve ser evitado. **[Grau de Evidência: Limitado]**

Recomendação 5: A inalação regular de fumaça da combustão de cannabis afeta adversamente a saúde respiratória. Embora os métodos alternativos de consumo possuam seus próprios riscos, é geralmente preferível evitar vias de administração que envolvam inalar a fumaça da combustão de cannabis (por exemplo, utilizando vaporizadores ou comestíveis). O uso de comestíveis elimina os riscos respiratórios, mas o início tardio do efeito psicoativo pode influenciar o consumo de doses maiores do que as pretendidas e, conseqüentemente, aumentar os efeitos adversos (principalmente agudos, por exemplo, devidos a alterações sensoriais). **[Grau de Evidência: Substantial]**

Recomendação 6: Os usuários devem evitar práticas como “inalação profunda”, retenção da respiração ou a manobra de Valsalva utilizadas para aumentar a absorção de ingredientes psicoativos ao fumar cannabis, pois essas práticas aumentam desproporcionalmente a exposição do sistema pulmonar a produtos tóxicos. **[Grau de Evidência: Limitado]**

Recomendação 7: O uso frequente ou intensivo (por exemplo, diário ou quase diário) de cannabis está fortemente associado a riscos mais elevados de desfechos adversos de saúde e sociais relacionados com o consumo de cannabis. Os usuários devem estar atentos e vigilantes para que seu uso de cannabis – e o de seus amigos, pares ou colegas usuários – permaneça, no máximo, ocasional (por exemplo, usar apenas 1 dia por semana, somente no fim de semana, etc.). **[Grau de Evidência: Substantial]**

Continued on next page

Box 1 Continued

Recommendation 8: Driving while impaired from cannabis is associated with an increased risk of involvement in motor-vehicle accidents. It is recommended that users categorically refrain from driving (or operating other machinery or mobility devices) for at least 6 hours after using cannabis. This wait time may need to be longer, depending on the user and the properties of the specific cannabis product used. Besides these behavioral recommendations, users are bound by locally applicable legal limits concerning cannabis impairment and driving. The use of both cannabis and alcohol results in multiply increased impairment and risks for driving, and categorically should be avoided. **[Evidence Grade: Substantial]**

Recommendation 9: There are some populations at probable higher risk for cannabis-related adverse effects who should refrain from using cannabis. These include individuals with predisposition for, or a first-degree family history of, psychosis and substance use disorders, as well as pregnant women (primarily to avoid adverse effects on the fetus or newborn). These recommendations, in part, are based on precautionary principles. **[Evidence Grade: Substantial]**

Recommendation 10: While data are sparse, it is likely that the combination of some of the risk behaviors listed above will magnify the risk of adverse outcomes from cannabis use. For example, early-onset use involving frequent use of high-potency cannabis is likely to disproportionately increase the risks of experiencing acute or chronic problems. The combination of these high-risk patterns of use should be avoided by the user and a focus for prevention. **[Evidence Grade: Limited]**

Recomendação 8: Dirigir veículos sob o efeito da cânabís está associado a um risco aumentado de envolvimento em acidentes de trânsito. Recomenda-se que usuários evitem sempre dirigir veículos (ou operar máquinas) pelo menos por seis horas após o uso de cânabís. Esse tempo de espera pode precisar ser maior, dependendo de características do usuário e das propriedades específicas do produto de cânabís usado. Além destas recomendações comportamentais, os usuários devem observar as legislações locais e limites relacionados à direção sob efeito de cânabís. O uso combinado de cânabís e álcool potencializa as alterações sensoriais, aumentando os riscos para a direção de veículos, devendo sempre ser evitado. **[Grau de Evidência: Substancial]**

Recomendação 9: Existem algumas populações que possuem um risco potencialmente maior de experienciar efeitos adversos e que devem abster-se do uso de cânabís. Estas incluem indivíduos com predisposição para (ou histórico de familiares de primeiro grau com) transtornos psicóticos e dependência química, assim como mulheres grávidas (principalmente para evitar efeitos adversos ao feto ou recém-nascido). Essas recomendações, em parte, são baseadas em princípios de precaução. **[Grau de Evidência: Substancial]**

Recomendação 10: Embora os dados sejam escassos, é provável que a combinação de alguns dos fatores de riscos comportamentais descritos acima aumente a possibilidade de ocorrerem efeitos adversos relacionados ao uso de cânabís. Por exemplo, o uso precoce envolvendo uso frequente de cânabís de alta potência provavelmente aumentará os riscos do usuário sofrer problemas agudos ou crônicos. A combinação desses padrões de uso de alto risco deve ser evitada pelo usuário, e deve haver um foco na prevenção. **[Grau de Evidência: Limitado]**

Reproduced and translated from Fischer et al.⁵⁴ with permission from Sheridan Content Solutions, The Sheridan Press, on behalf of The American Public Health Association. *This sentence included a wording error in the original publication of the LRCUG (in the American Journal of Public Health) which has been corrected here.

positions here on specific policy reform options for consideration – it nevertheless is a common activity, particularly among young adults. Different evidence-based options along the continuum of interventions are required to most effectively reduce the burden of cannabis-related health harms in the Brazilian population. Given these circumstances, it is appropriate and useful to present and make available the LRCUG to the context of health-oriented interventions and policy development for cannabis use in Brazil. While further culture- and setting-specific adaptation may be beneficial, the LRCUG (as is the case in other jurisdictions) may serve as a science-based information and discussion tool regarding health risks associated with cannabis use as well as a concrete, evidence-based targeted prevention tool to reduce risks for acute and chronic adverse health outcomes among cannabis users.

Prevention and other types of interventions for substance use typically require adaptation for the specific contexts for which they are intended; such adaptation has to strike a sensible balance between consideration of subjective sociocultural realities and fidelity to the intervention's original spirit and content.^{56,57} For adaptive consideration of the LRCUG for Brazil, it first needs to be restated that – unlike in countries such as Canada or Uruguay – cannabis use remains illegal in Brazil; hence, behaviors and issues addressed in the LRCUG, while with

the intention of protecting individual and public health, may involve matters of illegality, which naturally renders direct implementation and utilization challenging. Furthermore, there are distinct features of cannabis-related behaviors relevant for adaptive consideration. For example, most cannabis use in Brazil occurs through smoking of combusted cannabis products, most of which involves products of unknown or low quality.^{58,59} “Safer” alternatives for use methods considered by the LRCUG, like non-smoked products, are typically not available, and vaporizers or e-cigarette devices themselves are even illegal in Brazil, and therefore face additional barriers for utilization in practice.^{60,61} Moreover, the distinct practice of (smoked) use of cocaine-based products combined with cannabis is common among some Brazilian sub-populations, especially marginalized and impoverished individuals.⁶²⁻⁶⁴ While this typically occurs for “harm-reducing” effects (e.g., to mitigate acute withdrawal or mental health problems), distinct associated risks will require special consideration. Similarly, alcohol use and its consequential harms are prevalent among the Brazilian general population,^{65,66} and the distinct risks and harms from combined use of alcohol with cannabis may also warrant specific consideration towards the objectives of lower health risks. Finally, illegal drugs are associated with an extensively high toll of violence (including homicides) in Brazil; although this predominantly relates to

producers and traffickers, including organized crime, and mostly involves psychostimulants,⁶⁷⁻⁷⁰ the prevention of violence-related harms for cannabis users (e.g., in the context of exposure to illegal markets) may need to form an explicit consideration in adaptation of the LRCUG for the particular sociocultural contexts of Brazil.

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Disclosure

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