NCT
Neumología y Cirugía de Tórax

REVIEW ARTICLE

The protection of public health in the regulation of cannabis: a narrative review

La protección de la salud pública en la regulación del cannabis: una revisión narrativa

*Andrea Hernández-Pérez[1], Robinson Robles-Hernández[1], Jennifer Osio-Echánove[1], Leonor García-Gómez[1], Sebastián Rodríguez-Llamazares[2], Ireri Thirión-Romero[1], Raúl Martín-del-Campo[3], and Rogelio Pérez-Padilla[1]**

[1]Instituto Nacional de Enfermedades Respiratorias Ismael Cosío Villegas, Mexico City, Mexico; [2]Division of Respirology and Sleep Medicine, Department of Medicine, Queen's University, Ontario, Canadá; [3]Junta Internacional de Fiscalización de Estupefacientes, United Nations Organization, Vienna, Austria

Abstract

Several countries have legalized the supply of cannabis or considering doing so. There are important regulatory and control issues that need to be analyzed from a public health angle. This review provides a framework for writing about the health effects of cannabis use and public policy changes around the world that may lead to legislation that protects public health. A rapid narrative review was carried out with Cochrane methodology and the GRADE system between October 2021 and February 2024. Among the results that stand out are the varied models of legislation, with contributions in terms of consumption, it was observed that legalization generally generates an increase of consumption. The Framework Convention on Tobacco Control of the World Health Organization can be considered a regulatory model, that integrates consumption surveillance, protection from exposure, offering treatment, warning of the risks associated with its consumption, establishing prohibitions on advertising, promotion, and sponsorship, as well as apply taxes to the product that discourage its use. In addition, cannabis legislation should consider impairments of vehicle driving, and before all, must prioritize public health and well-being considering strengths and weaknesses of different legislations in countries.

Keywords: *Cannabis. Legislation. Regulation. Public health. Review.*

Resumen

Varios países han legalizado el acceso a cannabis o están considerando hacerlo. Desde la salud pública existen cuestiones regulatorias y de control importantes que se requiere considerar, motivo de la presente revisión rápida narrativa, con metodología Cochrane y sistema GRADE, realizada de octubre de 2021 a febrero de 2024. Dentro de los resultados destacan, por un lado, los variados modelos de legislación existentes, y por otro, que en general suelen conllevar un incremento del consumo. Desde el punto de vista respiratorio, se puede considerar como modelo de regulación el Convenio Marco para el Control del Tabaco de la Organización Mundial de la Salud, que integra la vigilancia del consumo, la protección de la

***Correspondence:**
Rogelio Pérez-Padilla
E-mail: perezpad@gmail.com

Date of reception: 15-11-2024
Date of acceptance: 12-12-2024
DOI: 10.24875/NCTE.M26000004

Available online: 03-02-2026
Neumol Cir Torax (Eng). 2025;84(1):15-23
www.revistanct.org.mx

exposición, ofrecer tratamiento, advertir de los riesgos asociados con su consumo, establecer prohibiciones sobre publicidad, promoción y patrocinio, así como aplicar impuestos al producto que desincentiven su uso. La legislación sobre el cannabis debe considerar, además, limitaciones para la conducción de vehículos y maquinaria, y ante todo priorizar el bienestar y la salud pública tomando como ejemplo las fortalezas y las debilidades de diversas legislaciones.

Palabras clave: *Cannabis. Legislación. Regulación. Salud pública. Revisión.*

Introduction

Disorders caused by drug use represent a considerable burden for individuals and society[1]. The World Drug Report states that between 2010 and 2022, the number of people who use drugs increased by 23%. Problems caused by drugs and dependence on them are preventable and treatable. With more than 209 million users, representing 4% of the world's population, cannabis is the most widely used illegal drug worldwide[2]. Thirteen million people have developed dependence, and among users of psychoactive substances, after alcohol, it is the most frequent reason for seeking treatment[3,4].

In the United States of America, the proportion of young adults who reported cannabis consumption in 2021 reached 43%, a significant increase from 29% in 2011. Consumption in the past month was reported by 29% of young adults in 2021, compared with 17% in 2011. Daily consumption also increased significantly duringthis period, reported by 11% of young adults compared with 6% previously[5].

In Mexico, according to data from the National Survey on Drug, Alcohol and Tobacco Consumption 2016-2017, cannabis remains the illegal substance with the highest consumption among the adult population, with a prevalence of 12.8%, representing a historic increase of 4.8% compared with 2008[6], and is comparable to the trend observed in other countries[7].

The main cannabinoids with psychoactive properties, namely, tetrahydrocannabinol (THC) with its isomers and stereochemical variants, are included in Schedule I of the Convention on Psychotropic Substances for having the capacity to produce a state of dependence and to constitute a public and social problem. Article 4, paragraph (c), of the 1961 Convention, as amended, limits the use of cannabis to medical and scientific purposes. According to the Convention, cannabinoids can be evaluated in controlled clinical trials to assess the benefits and harms of their use in medicine. The legalization of non-medical use is an evident violation of the Conventions and cannot be considered covered by flexibility, since such instances do not allow any exception to the limitation in question[8,9]. Recently, the United Nations Commission on Narcotic Drugs recognized the medical potential of cannabis, but only for the use of purified derivatives with pharmaceutical quality and standard medical-grade evidence of efficacy and safety; this does not apply to smoking cannabis, cannabis concentrates, or artisanal derivatives[10].

It is of considerable concern that the concentration of the most powerful psychoactive component of cannabis, THC, has been progressively increasing. The World Report[11] states that in the last 20 years, the potency of cannabis products has nearly quadrupled in the United States of America. The percentage of Δ9-THC increased from approximately 4% in 1995 to 16% in 2019. However, the percentage of adolescents who perceive cannabis as harmful has decreased by 40% during the same period, and a lower perception of the risks associated with drug use has been related to an increase in consumption rates.

Given this view, it is expected that increasing its availability and losing its illegal status will lead to an increase in its use[12], both exploratory and permanent.

Best public health practices should guide how to regulate cannabis effectively and minimize negative health impacts. That is, regulation should prioritize public health over other objectives, including industry profits, state tax revenues, and business development, which while valid bases for government action in general, can lead to harmful outcomes in the regulation of potentially harmful substances[13]. The public health approach should learn from the successes and failures of national and international regulatory frameworks for cannabis and other substances, especially tobacco. Valuable lessons can be taken from the history of tobacco control and legislation; it is documented that the tobacco industry designed its product to be increasingly addictive and issued misleading messages, creating variants supposedly promoted as reduced risk that ultimately were not[14,15].

Due to tobacco industry interference with public health policies, the World Health Organization (WHO) Framework Convention on Tobacco Control includes Article 5.3, which urges governments to take measures

to exclude the tobacco industry from policymaking[16]. It is especially concerning that the tobacco industry shows interest in the cannabis and electronic cigarette business, as these are also being used to inhale THC from high-concentration liquids, which increase the risk of addiction and toxicity[17,18]. Given the danger that tobacco companies may enter the cannabis market, their acquisition of shares in the cannabis business has been prohibited in the United States of America[19].

Although existing literature may be limited in answering how legalization and regulation will affect cannabis use and associated outcomes, it does offer significant information on how we should evaluate the effects of changes in public policy.

This narrative review aims to describe tools for legislation that protect public health in relation to cannabis, reviewing the health effects of its consumption and the impact of changes in global policy.

Method

The recommendations of the Cochrane Group for Rapid Reviews[20] were followed. An exhaustive search on cannabis and its legislation was conducted from October 2021 to February 2024, using material available in English and Spanish in the PubMed, MEDLINE, Embase, PsycINFO, and CENTRAL (Cochrane Controlled Register of Trials) databases, governmental websites, and databases from Public Health Departments and the International Narcotics Control Board (INCB). The following terms were used for the search: [marijuana OR cannabis], [legalization OR public health OR policy], and [problematic use OR risky use OR health]. Other potentially relevant studies were searched by screening reference lists and citations of included studies. All authors reviewed and analyzed them using the GRADE (Grading of Recommendations Assessment, Development and Evaluation) system and discussed the articles to provide recommendations. We present the following article according to the narrative review reporting checklist[21].

Health effects

Cannabis has immediate harmful effects when under the influence of its components when smoked, which is the most common route, and additionally can manifest negative health effects in the medium and long term[22].

Acute harmful effects

During acute cannabis intoxication, people may exhibit rapid deterioration in attention and reaction time[23]. These effects can affect the ability to drive automobiles and machinery, causing traffic and workplace accidents[24]. Episodic consumption also increases the frequency of coronary events and the risk of cardiovascular diseases in young subjects, who generally have a low baseline risk[25].

During this intoxication, there may be psychotic responses. Daily cannabis consumption has been associated with an increased risk of psychotic disorder compared to people who had never consumed it (odds ratio [OR]: 3.2; 95% confidence interval [95% CI]: 2.2-4.1), especially for daily usage of high-potency cannabis (OR: 4.8; 95% CI: 2.5-6.3)[26]. Heavy cannabis consumption increases the risk of psychotic states in a dose-response relationship[27]. Emergency department visits in the United States of America for cannabis intoxications have been progressively increasing in parallel with the increase in THC concentration in cannabis leaves[28].

Chronic harmful effects, medium and long term

Cannabis consumption can be problematic in at least one-third of users, a condition called “cannabis use disorder.” Cannabis withdrawal syndrome has also been documented, which includes alterations in mood, increased perceived stress, and irritability[29,30]. These disorders are more common in subjects who consumed habitually or significantly during adolescence, appearing more frequently than in those who started consumption as adults, so it has been suggested that the initiation of use should not be permitted until age 24[30,31].

People with cannabis addiction have an increased risk of serious problems in attention, memory, and learning[32]. In addition to acute emotional disorders related to withdrawal, such as irritability and anxiety[33], prolonged cannabis consumption is associated with affective dysregulation. A systematic review found an association between cannabis consumption in adolescence and the risk of developing depression (OR: 1.37; 95% CI: 1.16-1.62; I^2: 0%), suicidal ideation (OR: 1.50; 95% CI: 1.11-2.03; I^2: 0%), and suicide attempt (OR: 3.46; 95% CI: 1.53-7.84; I^2: 61.3%). The high prevalence of adolescents who consume cannabis could generate a large number of young people who develop depression and suicidal tendencies related to this consumption[34].

Respiratory effects

Cannabis smoke, a product of plant combustion, is very similar in composition to tobacco, if we leave aside the addictive alkaloids specific to each and the possible flavorings, substances added to manufactured cigarettes, and chemicals used in cultivation. Cannabis smokers have reported more susceptibility to respiratory infections, wheezing, difficulty breathing, altered pulmonary function tests, cough, phlegm production, bronchodilation, and other respiratory symptoms[35]. These symptoms are explained by irritation of the airways and lungs, which affects mucociliary movement, an important defense against respiratory infections.

A case-control study identified that cannabis smokers presented more severe chronic respiratory symptoms, including wheezing, difficulty breathing, altered pulmonary function tests, cough, phlegm production, and bronchodilation[36]. It has also been described that they can develop bullous lung disease with a higher incidence of tension pneumothorax than tobacco smokers and non-smokers, experiencing prolonged postoperative stays and a higher incidence of pneumothorax recurrence after the operation. The risk of chronic respiratory symptoms and bullous lung disease in cannabis smokers has been reported to be dose-related[37-40].

Despite this, several known effects of tobacco have been difficult to demonstrate in pure cannabis users, and clarifying cannabis's role is complicated by the fact that many people consume both cannabis and tobacco. While cannabis is capable of producing chronic bronchitis and changes in bronchial lining cells similar to those observed in tobacco smokers, it has been difficult to demonstrate chronic obstructive pulmonary disease, emphysema, and accelerated decline in lung function in cannabis users who do not smoke tobacco[35,41].

Smoking cannabis does not help treat asthma, as disseminated in many pro-cannabis forums; on the contrary, it can worsen cases and exacerbate crises[35], despite Δ9-THC having bronchodilator properties.

Prolonged cannabis consumption may increase the risk of testicular cancer, but in general, the relationship between cannabis use and the development of certain types of cancer remains unclear[42,43], which is striking because cannabis smoke contains known carcinogens. Lung cancer has not been consistently associated with pure cannabis users, but its frequent combination with tobacco (whether simultaneous or sequential) makes cannabis users a high-risk group.

Results of cannabis legislation policy in various countries

Legislation has progressed more rapidly than the acquisition of knowledge about its risks, especially at the population level. In fact, several national legislation proposals have been developed without taking advantage of experience in cannabis regulation or legalization in other countries. Table 1 lists the main considerations, foundations, and results obtained after cannabis legislation for recreational use in various countries.

Evaluating the changes caused by legalization, regulation, and decriminalization of cannabis use has been a challenge, due in part to heterogeneity in the forms and principles on which evaluation by various involved entities is based.

Many of the public health impacts related to cannabis legalization, including increases in its consumption, occurred initially in Canada and the states of Washington and Colorado, prior to the issuance of laws that allowed the existence of a legal industry that produced, promoted, and sold cannabis products, because in these places the commercialization of smoked cannabis as medicine was permitted. The promotion of smoked cannabis as medicine led to an explosion in the number of patients who consumed it, in addition to normalizing its consumption and, therefore, increasing consumption prevalence and related health consequences.

Both the WHO and the INCB have insisted that smoked cannabis should not be prescribed as medicine. If necessary, and after appropriate clinical trials and fulfilling regulatory requirements requested of any new medication, standardized medications regulated by government public health and health risk agencies should be prescribed, which may contain cannabinoids such as cannabidiol or THC[1-3].

Considerations for health protection

Given limited information, the best procedure is to prioritize protection and exercise caution. We present legislative versions with experiences in the Netherlands, the United States of America, Uruguay, Canada, Luxembourg, and Malta[44-59], which include and integrate best public health practices and can be considered at a minimum level:

– Make maximum use of available information and experience from various existing legislations (Table 1). While acquiring one's own information is required, many of the consequences of a legislative scheme

Table 1. Main points of international cannabis legislation (legalization and regulation)

Country (year)	Considerations and foundations	Results obtained
Netherlands (1976)[44,45]	– The policy objective is to reduce drug demand, drug supply, and risks to users, those around them, and society – In 1990, coffee shops authorized to sell and consume cannabis in quantities of no more than 5 g per person per day were created, strictly regulated; they control the quantity and conditions under which they are sold and consumed, without advertising drugs – Minors under 18 years old do not have access to coffee shops or purchases	– These establishments have given rise to the sale of other drugs and increased sale of designer drugs – Low rates of human immunodeficiency virus among people who use drugs and comparatively low cannabis consumption among young people – Fewer arrests for minor drug-related offenses – Increase in illicit substance trafficking in the past year[45]
USA (1996) Private sector participation[46]	– Recreational use (2012) legal, modeled on alcohol regulations – Medical use (1996); in some states consumption is permitted for medical use, including products with regulated THC concentrations[47]	– In Washington, perceived risk of cannabis consumption in adolescents decreased and consumption increased after legalization of recreational use[48,49]; lower perception of harm risk with its use in adolescents[52] – Emergence of risks from unintentional cannabis exposure in children[50] – Legalization of recreational cannabis in the USA was associated with a 15% increase in fatal motor vehicle collisions and a 16% relative increase in associated deaths, without conclusive differences between the first year and subsequent years after legalization[51] – The findings reported in the World Drug Report (2022)11 indicate: general increase in cannabis consumption with a reduction in the gender gap; increase in the proportion of people with psychiatric disorders associated with regular cannabis consumption and in consumption among pregnant women even before, during, and after pregnancy, compared to those in states that have not legalized it – A "simultaneous quadruple confluence" of increased prevalence of use, increased intensity (frequency and quantities) of use, increased THC content of cannabis products, and increased hospitalizations for acute intoxications or cannabis use disorders – So far, legalization has not displaced illegal markets; it remains attractive for different reasons, including price, quality, and accessibility
Uruguay (2013) Greater state control[53]	– Includes recreational use – Central state commission with sales monopoly and control of production, packaging, distribution, sale, promotion, and profit distribution – Government authorities have declared that Uruguay's capacity for monitoring systems of public health impact is very limited – Home plant cultivation authorized, as well as clubs where members can acquire cannabis – Sale only in approved places, or commission sales points, with defined locations and characteristics, and health messages; they can sell in pharmacies in packages with content and without promotion (neutral) – Maximum weekly sale of 10 g per person – Marked THC content, with preferential prices for low THC, less addictive – Driving under the influence of cannabis is prohibited; the limit for driving under the influence of cannabis has been set at a serum THC level of 10 ng/ml	– Consumption among adolescents increased between 2009 and 2018, being the group most impacted by legalization[54] – Thanks to market restrictions imposed by the state monopoly, THC content and the range of cannabis products have remained stable[8] – An association is reported with an immediate 52.4% increase (95% CI: 11.6-93.3; p = 0.012) in the fatality rate of light vehicle drivers; however, no significant change was observed in the mortality rate of motorcyclists. In Montevideo, legislation was associated with an absolute increase in the mortality rate of light motor vehicle drivers by 0.06 (95% CI: 0.01-0.11; p = 0.025), but no significant associations were observed in rural settings[55] – The illegal market continues; it is estimated that only half of the cannabis consumed in the country is of legal origin

(Continued)

Table 1. Main points of international cannabis legislation (legalization and regulation) *(continued)*

Country (year)	Considerations and foundations	Results obtained
Canada (2018)[56]	– Legalization and regulation of the use, production, and sale of cannabis for non-medical purposes – Minimum age for consumption and legal purchase: 18 years in Alberta, 21 years in Quebec, and 19 years in all other provinces – Restrict places of use and prohibit advertising – Regulate the legal availability of a variety of commercially produced cannabis products through retail systems – Define provisions for limited home cultivation and a personal possession limit (30 g) of cannabis in most provinces – Driving vehicles under the influence of cannabis is prohibited based on defined limits – Provisions vary for each province	– Legalization was associated with a 26% increase in the prevalence of current cannabis consumption, with confidence intervals of 23.1% to 29.1% ($p = 0.01$)[57] – According to the World Drug Report (2022)[11], there has been an increase in consultations for mental disorders associated with consumption; there has been a clear diversification of cannabis products, with very potent products such as concentrates and edibles entering the market after legalization, and the average THC level in cannabis has increased after legalization – Coexistence of the illegal cannabis market
Luxembourg (2021)[58]	– Legalization and regulated use for recreational purposes – Public possessions no greater than 3 g – Sale of seeds and derived products is regulated by the state – Cultivation is permitted for people over 18 years of age for personal consumption, no more than four plants inside their home – Retail sale and commercialization are prohibited	– Increase in market dispute by Canadian companies – Recent legislation, with pending evaluation of short, medium, and long-term impact
Malta (2021)[59]	– Legalization for recreational purposes – It is legal to carry up to 7 g of cannabis – It is legal to establish cannabis associations – Crops between 7 g per day and 50 g per month – It is prohibited to smoke cannabis in public – Each household can grow four plants – Only for those over 21 years old	– Recent legislation, with pending evaluation of short, medium, and long-term impact

95% CI: 95% confidence interval; THC: tetrahydrocannabinol.

can be learned from experiences in other countries and can be contrasted with the strength of institutions in countries that are close to regulating commercialization.

– Above all, marketing aimed at increasing sales must be prohibited, and efforts must be made to prevent the participation of the powerful tobacco and alcohol industries to the greatest extent possible.
– A cannabis legislation model should consider the cost-effective measures included in the WHO Framework Convention on Tobacco Control[16], known as MPOWER (Monitor, Protect, Offer, Warn, Enforce and Raise taxes):
  • Monitor cannabis use, its effect on comprehensive health, and monitoring of compliance with control policies.
  • Protect from exposure by completely prohibiting promotion of its use, advertising, promotion, and sponsorship, which would ensure that public health interests are prioritized over commercial ones.
  • Offer evidence-based treatments for cessation, which requires developing care centers with trained professionals before any legislation.
  • Warn about health risks on packaging, and ensure it is neutral to avoid making it attractive and incentivizing consumption, including detailed description of content and its risks.
  • Enforce by applying taxes to cannabis products to have a disincentive effect, especially on adolescents, with the plan that they are progressively updated. In the case of tobacco, this measure has immediate effects and provides economic resources that can be applied to prevention or addiction treatment.
  • Raise taxes: Protect the population from second-hand cannabis smoke; it is important to avoid its use in public and especially to prohibit smoking cannabis in places where smoking tobacco is prohibited.
– Establish measures to prevent traffic and workplace accidents derived from acute intoxication from cannabis

consumption. A program such as "Drive without alcohol" should be expanded to "Drive without alcohol and without cannabis" to identify individuals who exhibit impairments in attention and reaction times through a sensorimotor skills test, corroborated by a THC detection test in saliva that detects recent use, in addition to behavioral tests of psychomotor performance.

– Ensure that access to cannabis and its products is restricted to those over 24 years of age, with auditable and verifiable measures, such as obtaining a copy or photo of an identity document and verifying age in establishments with a health license. This implies incorporating all procedures that have been implemented in other regions, as well as clearly establishing which will be the competent bodies for commercialization oversight and attributing powers to them that improve law enforcement.
– Develop and strengthen prevention and intervention programs aimed primarily at adolescents, but also at adults. These programs should generate comprehensive family prevention actions with training for parents, children, and the family collectively. Allocate budget to programs that promote the acquisition of social skills such as social influence approaches, budget for prevention campaigns in mass media, health centers, schools, and workplaces. Also create preventive programs focused on the adult population, highlighting the risks associated with substance use and addressing the low perception of risk. Evidence-based preventive interventions need to encompass the entire prevention chain, from universal and selective prevention to indicated prevention. Promoting education about "safer" routes of cannabis administration will become critical, and it will be essential to control cannabis-related deterioration and reduction in use.
– Consider education about the potential risks of mixing cannabis with alcohol or other drugs, as their effects could be drastically intensified.
– Establish public policy reinforcement mechanisms to optimize treatment, rehabilitation, and social reintegration of people with problematic use of psychoactive cannabis, without subjecting them to criminalization or discrimination for any reason. Treatments should be free and universally accessible, and should contemplate attention to vulnerable populations, multiculturalism, gender issues, and age.
– Raise awareness among health professionals about the health risks associated with cannabis consumption and train them to provide brief advice and treatment.
– Limit the potency of cannabis products. The THC content of cannabis plants and derived products, including vaping liquids, must be identified and limits must be placed on the permitted concentration, in order to reduce the risk of addiction and acute intoxication. For example, in the United Kingdom, a concentration exceeding 2 ng/mL is considered to represent a driving risk. The increase in THC concentration makes the product more addictive and produces more acute intoxications that include psychotic-type reactions.
– An additional way to discourage the use of THC, especially at high concentrations, is to establish a tax rate that increases proportionally to the THC concentration of plants and vaping liquids (which currently have a prohibition legislative framework).

Conclusions

Cannabis has been the most widely used illicit drug worldwide, making it essential to educate the public about the consequences associated with its use. It is by no means an innocuous and risk-free substance, as is sometimes suggested. Chronic use leads to addiction and carries the risk of developing mental disorders such as depression and schizophrenia, and if smoked, entails the risk of lung damage. Regulations governing its sale and acquisition must be carefully elaborated.

A policy that includes a centralized state commission with monopoly may be advantageous, since in countries where this was adopted, no significant increase in consumption has been observed. Likewise, it is important to monitor, control, and warn about the concentrations of psychotropic compounds in cannabis-derived products. The MPOWER model for tobacco control can be incorporated into cannabis legislation that prioritizes public health and population well-being. It is essential to be clear about the results that have been obtained with different legislations in other countries to avoid the risk of fostering addiction and increasing healthcare expenses in both the short and long term.

Funding

No funding was received.

Conflicts of interest

The authors declare they have no conflicts of interest.

Ethical considerations

Protection of people and animals. The authors declare that no experiments were conducted on humans or animals for this research.

Confidentiality, informed consent, and ethical approval. The study does not involve personal patient data or require ethical approval. SAGER guidelines do not apply.

Declaration on the use of artificial intelligence. The authors declare that they did not use any type of generative artificial intelligence for the writing of this manuscript.

References

1. Organización Panamericana de la Salud. Abuso de sustancias. OPS/OMS; 2024. Disponible en: https://www.paho.org/es/temas/abuso-sustancias.
2. United Nations Office on Drugs and Crime. 2023. Available from: https://www.unodc.org/unodc/en/index.html.
3. World Health Organization. Cannabis. WHO; 2022. Available from: https://www.who.int/teams/control-of-neglected-tropical-diseases/yaws/diagnosis-and-treatment/alcohol-drugs-and-addictive-behaviour.
4. Degenhardt L, Ferrari AJ, Hall WD. The global epidemiology and disease burden of cannabis use and dependence. En: Preedy VR, editor. Handbook of cannabis and related pathologies. Biology, pharmacology, diagnosis, and treatment. Elsevier; 2017. p. 89-100. Available from: https://www.sciencedirect.com/science/article/pii/B9780128007563000119.
5. National Institute on Drug Abuse. 2022. Marijuana and hallucinogen use among young adults reached all time-high in 2021. Available from: https://nida.nih.gov/news-events/news-releases/2022/08/marijuana-andhallucinogen-use-among-young-adults-reached-all-time-high-in-2021.
6. Instituto Nacional de Salud Pública. Encuesta Nacional de Consumo de Drogas, Alcohol y Tabaco, ENCODAT 2016-2017. Available from: http://www.gob.mx/salud%7Cconadic/acciones-y-programas/encuesta-nacional-de-consumo-de-drogas-alcohol-y-tabaco-encodat-2016-2017-136758.
7. Manthey J, Freeman TP, Kilian C, López-Pelayo H, Rehm J. Public health monitoring of cannabis use in Europe: prevalence of use, cannabis potency, and treatment rates. Lancet Reg Health Eur. 2021;(10):100227.
8. International Narcotics Control Board. Annual report 2018. Available from: https://www.incb.org/incb/en/publications/annual-reports/annualreport-2018.html.
9. International Narcotics Control Board. Annual Report 2021. Available from: https://www.incb.org/incb/en/publications/annual-reports/annualreport-2021.html.
10. United Nations. UN News 2023. Available from: https://news.un.org/en/
11. United Nations. Informe Mundial sobre las Drogas 2022. Available from: https://www.unodc.org/res/wdr2022/MS/WDR22_Booklet_1_spanish.pdf.
12. Salloum NC, Krauss MJ, Agrawal A, Bierut LJ, Grucza RA. A reciprocal effects analysis of cannabis use and perceptions of risk. Addiction. 2018;113:1077-85.
13. Orenstein DG, Glantz SA. Cannabis legalization in state legislatures: public health opportunity and risk. Marquette Law Rev. 2020;103:1313-400.
14. Lawrence F. Big Tobacco, war and politics. Nature; 2019. Available from: https://www.nature.com/articles/d41586-019-02991-w.
15. Weishaar H, Collin J, Smith K, Grüning T, Mandal S, Gilmore A. Global health governance and the commercial sector: a documentary analysis of tobacco company strategies to influence the WHO Framework Convention on Tobacco Control. PLoS Med. 2012;9:e1001249.
16. Organización Mundial de la Salud. Convenio Marco de la OMS para el Control del Tabaco. CMCT OMS; 2003. Available from: https://iris.who.int/bitstream/handle/10665/42813/9243591010.pdf.
17. National Institute on Drug Abuse. ¿Cuáles son los factores de riesgo y cuáles son los factores de protección? 2022. Available from: https://www.drugabuse.gov/es/publicaciones/como-prevenir-el-uso-de-drogas/capitulo-1-los-factores-de-riesgo-y-los-factores-de-proteccion/cuales-son-los-fa.
18. Werner AK, Koumans EH, Chatham-Stephens K, Salvatore PP, Armatas C, Byers P, et al. Hospitalizations and deaths associated with EVALI. N Engl J Med. 2020;382:1589-98.
19. Big Tobacco is coming for legal marijuana. The Boston Globe. 2021. Available from: https://www.bostonglobe.com/2021/04/08/opinion/big-tobacco-is-coming-legal-marijuana/.
20. Cochrane Methods Rapid Reviews. Available from: https://methods.cochrane.org/rapidreviews/.
21. Green BN, Johnson CD, Adams A. Writing narrative literature reviews for peer-reviewed journals: secrets of the trade. J Chiropr Med. 2006;5:101-17.
22. Martinasek MP, McGrogan JB, Maysonet A. A systematic review of the respiratory effects of inhalational marijuana. Respir Care. 2016;61:1543-51.
23. Volkow ND, Baler RD, Compton WM, Weiss SR. Adverse health effects of AQ3 marijuana use. N Engl J Med. 2014;370:2219-27.
24. Hartman RL, Brown TL, Milavetz G, Spurgin A, Pierce RS, Gorelick DA, et al. Cannabis effects on driving lateral control with and without alcohol. Drug Alcohol Depend. 2015;154:25-37.
25. Patel RS, Kamil SH, Bachu R, Patel RS, Kamil SH, Bachu R, Adikey A, Ravat V, Kaur M, et al. Marijuana use and acute myocardial infarction: a systematic review of published cases in the literature. Trends Cardiovasc Med. 2020;30:298-307.
26. Di Forti M, Quattrone D, Freeman TP, Tripoli G, Gayer-Anderson C, Quigley H, et al. The contribution of cannabis use to variation in the incidence of psychotic disorder across Europe (EU-GEI): a multicentre case-control study. Lancet Psychiatry. 2019;6:427-36.
27. Marconi A, Di Forti M, Lewis CM, Murray RM, Vassos E. Meta-analysis of the association between the level of cannabis use and risk of psychosis. Schizophr Bull. 2016;42:1262-9.
28. Hall W, Lynskey M, Hall W, Lynskey M. Assessing the public health impacts of legalizing recreational cannabis use: the US experience. World Psychiatry. 2020;19:179-86.
29. Fuster D, Zuluaga P, Muga R. Trastorno por uso de sustancias: epidemiología, complicaciones médicas y tratamiento. Med Clin (Barc). 2024;162:431-8.
30. López-Quintero C, Pérez de los Cobos J, Hasin DS, Okuda M, Wang S, Grant BF, et al. Probability and predictors of transition from first use to dependence on nicotine, alcohol, cannabis, and cocaine: results of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). Drug Alcohol Depend. 2011;115:120-30.
31. Zehra A, Burns J, Liu CK, Manza P, Wiers CE, Volkow ND, et al. Cannabis addiction and the brain: a review. J Neuroimmune Pharmacol. 2018;13:438-52.
32. Davis JP, Smith DC, Morphew JW, Lei X, Zhang S. Cannabis withdrawal, posttreatment abstinence, and days to first cannabis use among emerging adults in substance use treatment: a prospective study. J Drug Issues. 2016;46:64-83.
33. Heitzeg MM, Cope LM, Martz ME, Hardee JE, Zucker RA. Brain activation to negative stimuli mediates a relationship between adolescent marijuana use and later emotional functioning. Dev Cogn Neurosci. 2015;16:71-83.
34. Gobbi G, Atkin T, Zytynski T, Wang S, Askari S, Boruff J, et al. Association of cannabis use in adolescence and risk of depression, anxiety, and suicidality in young adulthood: a systematic review and meta-analysis. JAMA Psychiatry. 2019;76:426-34.
35. Khoj L, Zagà V, Amram DL, Hosein K, Pistone G, Bisconti M, et al. Effects of cannabis smoking on the respiratory system: a state-of-the-art review. Respir Med. 2024;221:107494.
36. Stefani A, Aramini B, Baraldi C, Pellesi L, Della Casa G, Morandi U, et al. Secondary spontaneous pneumothorax and bullous lung disease in cannabis and tobacco smokers: a case-control study. PLoS One. 2020;15:e0230419.
37. Tan C, Hatam N, Treasure T. Bullous disease of the lung and cannabis smoking: insufficient evidence for a causative link. J R Soc Med. 2006;99:77-80.
38. Ribeiro LI, Ind PW. Effect of cannabis smoking on lung function and respiratory symptoms: a structured literature review. NPJ Prim Care Respir Med. 2016;26:16071.
39. Centers for Disease Control and Prevention. Cannabis health effects. Available from: https://www.cdc.gov/cannabis/health-effects/?CDC_AAref_Val=https://www.cdc.gov/marijuana/health-effects/index.html.
40. Tashkin DP, Roth MD. Pulmonary effects of inhaled cannabis smoke. Am J Drug Alcohol Abuse. 2019;45:596-609.
41. National Academies of Sciences, Engineering, and Medicine, Health and Medicine Division, Board on Population Health and Public Health Practice, Committee on the Health Effects of Marijuana: An Evidence Review and Research Agenda. The health effects of cannabis and cannabinoids: the current state of evidence and recommendations for research. Washington (DC): National Academies Press (US); 2017. Available from: http://www.ncbi.nlm.nih.gov/books/NBK423845/.
42. Ghasemiesfe M, Barrow B, Leonard S, Keyhani S, Korenstein D. Association between marijuana use and risk of cancer: a systematic review and meta-analysis. JAMA New Open. 2020;3:e1921065.

43. Huang YHJ, Zhang ZF, Tashkin DP, Feng B, Straif K, Hashibe M. An epidemiologic review of marijuana and cancer: an update. Cancer Epidemiol Biomarkers Prev. 2015;24:15-31.
44. Government of the Netherlands. Toleration policy regarding soft drugs and coffee shops - drugs. Ministerie van Algemene Zaken; 2013. Available from: https://www.government.nl/topics/drugs/toleration-policy-regardingsoft-drugs-and-coffee-shops.
45. Open Society Foundations. Coffee shops and compromise: separated illicit drug markets in the Netherlands. Available from: https://www.opensocietyfoundations.org/publications/coffee-shops-and-compromise-separated-illicit-drug-markets-netherlands.
46. Pardo B. Cannabis policy reforms in the Americas: a comparative analysis of Colorado, Washington, and Uruguay. Int J Drug Policy. 2014;25:727-35.
47. U.S. Food & Drug Administration. FDA regulation of cannabis and cannabis-derived products, including cannabidiol (CBD). FDA; 2024. Available from: https://www.fda.gov/news-events/public-health-focus/fdaregulation-cannabis-and-cannabis-derived-products-including-cannabidiol-cbd.
48. United Nations. Office on Drugs and Crime. World Drug Report 2021. Available from: www.unodc.org/unodc/en/data-and-analysis/wdr2021.html.
49. Cerdá M, Wall M, Feng T, Keyes KM, Sarvet A, Schulenberg J, et al. Association of state recreational marijuana laws with adolescent marijuana use. JAMA Pediatr. 2017;171:142-9.
50. Wang GS, Heard K, Roosevelt G. The unintended consequences of marijuana legalization. J Pediatr. 2017;190:12-3.
51. Windle SB, Eisenberg MJ, Reynier P, Cabaussel J, Thombs BD, Grad R, et al. Association between legalization of recreational cannabis and fatal motor vehicle collisions in the United States: an ecologic study. CMAJ Open. 2021;9:E233-41.
52. Sarvet AL, Wall MM, Keyes KM, Cerdá M, Schulenberg JE, O'Malley PM, et al. Recent rapid decrease in adolescents' perception that marijuana is harmful, but no concurrent increase in use. Drug Alcohol Depend. 2018;186:68-74.
53. Junta Nacional de Drogas. Decreto 79/016 Modificación de la reglamentación de la Ley 19.172 relativo a la regulación y control del cannabis. Available from: https://www.gub.uy/junta-nacional-drogas/institucional/normativa/decreto-79016-modificacion-reglamentacion-ley-19172-relativo-regulacion.
54. Laqueur H, Rivera-Aguirre A, Shev A, Castillo-Carniglia A, Rudolph KE, Ramírez J, et al. The impact of cannabis legalization in Uruguay on adolescent cannabis use. Int J Drug Policy. 2020;80:102748.
55. Nazif-Munoz JI, Oulhote Y, Ouimet MC. The association between legalization of cannabis use and traffic deaths in Uruguay. Addiction. 2020;115:1697-706.
56. Canadian Centre on Substance Use and Addiction. Policy and Regulations (Cannabis). Available from: https://www.ccsa.ca/policy-and-regulationscannabis.
57. Hawley P, Gobbo M, Afghari N. The impact of legalization of access to recreational cannabis on Canadian medical users with cancer. BMC Health Serv Res. 2020;20:977.
58. Le Gouvernement Du Grand-Duché de Luxembourg. Loi du 27 avril 2001 modifiant la loi modifiée du 19 février 1973 concernant la vente de substances médicamenteuses et la lutte contre la toxicomanie. Legilux. Available from: https://legilux.public.lu/eli/etat/leg/loi/2001/04/27/n1/jo.
59. Times Malta. Cannabis bill approved in parliament, in first for Europe. Available from: https://timesofmalta.com/articles/view/cannabis-bill-approved-in-parliament-in-first-for-europe.921310.