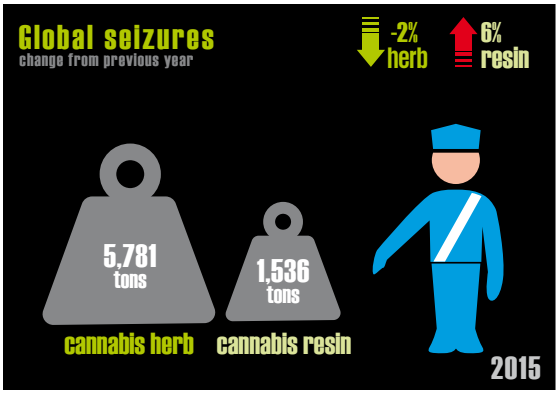
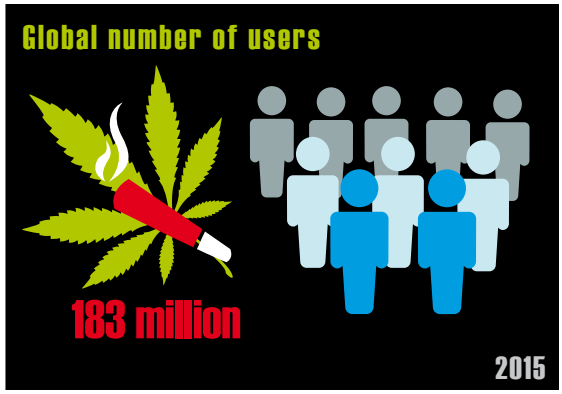
C. THE CANNABIS MARKET





Note: Data refer to 2015. Estimates of illicit cultivation, production and eradication of cannabis and prevalence of cannabis use are available in the annex of booklet 2.

Cannabis production remains a global phenomenon

Cannabis plant cultivation — either through direct indicators (cultivation or eradication of cannabis plants) or indirect indicators (seizures of cannabis plants, domestic cannabis production being indicated as the source of seizures, etc.) — was reported on the territory of 135 countries in the period 2010-2015, covering 92 per cent of the world population. Given the absence of systematic measurements, however, the extent and trends in cannabis cultivation and production are difficult to assess. Most indirect indicators come from law enforcement authorities and, to a certain extent, reflect their priorities and resources.[47]

Morocco remains the country most reported by Member States as the source of cannabis resin, followed by Afghanistan and, to a lesser extent, Lebanon, India and Pakistan. In contrast to trafficking in cannabis resin, which is not only intraregional but also interregional (notably, trafficking from North Africa to Europe), trafficking in cannabis herb continues to be largely intraregional. Thus, it is more useful to identify the countries most frequently reported at the regional level as countries of origin over the period 2010-2015 (see box).

47 For more details, see *World Drug Report 2015*, box on "Interpreting drug seizures", p. 27.

Countries most frequently reported as countries of origin of cannabis herb, by region/subregion, 2010-2015

- The most often reported source country for transnational shipments in North America was Mexico, followed by Canada. Although this does not mean that Mexico is the largest producer of cannabis in North America. Significant amounts of cannabis herb are produced in the United States, though mostly for domestic consumption and not for export.
- In South America, the Caribbean and Central America, the most frequently reported source countries of cannabis herb were Colombia and Paraguay, followed by Jamaica.
- In Africa, the most frequently reported source countries were Nigeria, Mozambique, Ghana and Swaziland, although it is difficult to identify specific countries in Africa, because a number of other countries were also reported.
- In Asia, the most frequently identified source country was Afghanistan, followed by Kyrgyzstan, Myanmar, the Lao People's Democratic Republic, Lebanon, India and Nepal.
- In Europe, the two most frequently mentioned source countries for cross-border trafficking of cannabis herb were the Netherlands and Albania.

Source: UNODC, based on responses to the annual report questionnaire.

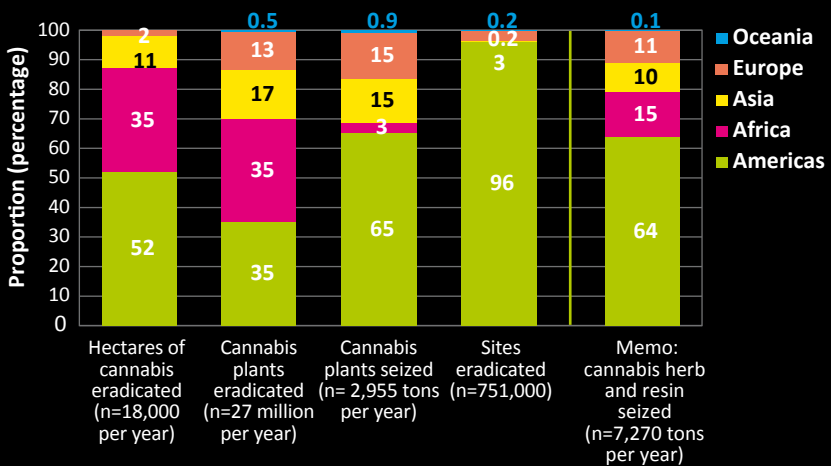
Eradication as an indicator of cannabis production

Measuring the extent of eradication is challenging because some countries report eradication in terms of hectares, while others report in terms of numbers of cannabis plants eradicated, weight of cannabis plants seized or number of cannabis cultivation sites eradicated. This makes comparisons of eradication difficult.

The largest areas of eradicated cannabis cultivation over the period 2010-2015 were reported by Mexico, followed by Morocco and Nigeria. The largest numbers of cannabis cultivation sites eradicated were reported by the United States, followed by Ukraine, the Netherlands and the Russian Federation. The largest numbers of cannabis plants eradicated were reported by Nigeria, followed by the United States, the Philippines and Paraguay. Finally, the largest quantities of cannabis plants seized were reported by Bolivia (Plurinational State of) and Peru, followed by Jamaica.

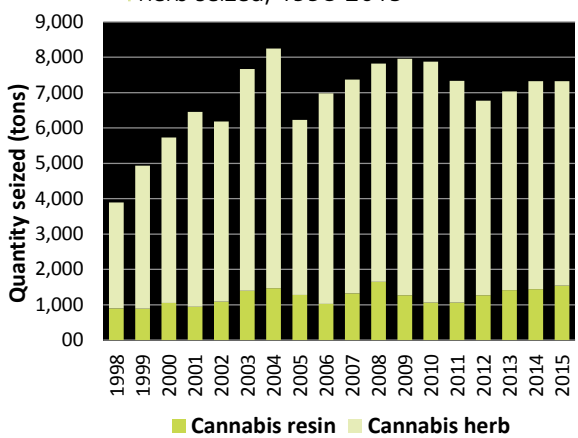
The combination of the various indicators suggests that the world's largest areas of cannabis cultivation subjected to eradication over the period 2010-2015 were located in the Americas. This may indicate the global predominance of that region in cannabis cultivation, but may also point to the extent to which law enforcement authorities have been prioritizing the eradication of cannabis cultivation, which could also have played a role. The second largest area of cannabis cultivation eradicated was in Africa, followed by Asia and Europe, then Oceania. The average distribution of cannabis eradication turns out to be quite similar to that of overall cannabis herb and resin seizures reported at the global level over the period 2010-2015. Patterns of cultivation may differ from patterns of law enforcement operations targeting cannabis cultivation; in Africa, in particular, where law enforcement capabilities are quite modest, the importance of cannabis cultivation may be greater than that indicated by the extent of eradication and seizures.

Available indicators of the distribution of eradication of cannabis production, by region, 2010-2015



Source: UNODC calculations, based on responses to the annual report questionnaire.

FIG. 22 | Global quantities of cannabis resin and herb seized, 1998-2015

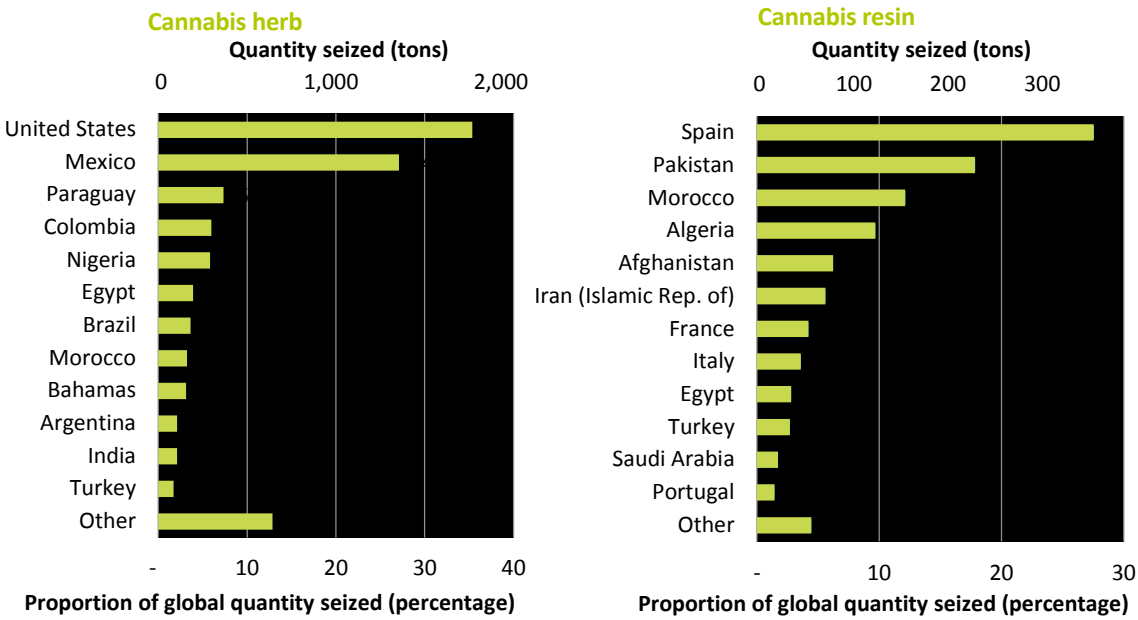


Source: UNODC, based on responses to the annual report questionnaire.

Cannabis trafficking

Based on quantities intercepted, the trafficking of cannabis seems to have stabilized at a high level in the past decade (compared with the level in the late 1990s). Over the period 2010-2015, quantities of herbal cannabis seized were more than four times those of cannabis resin, with some 6,000 tons of cannabis herb and 1,300 tons of cannabis resin intercepted annually. In 2015, the largest cannabis herb seizures worldwide were reported by Mexico, followed by the United States, Nigeria, Paraguay and Egypt; the largest cannabis resin seizures were reported by Spain, Pakistan and Morocco, followed by Afghanistan and Algeria.

FIG. 23 Global quantities of cannabis seized, annual average, by product and by country, 2010-2015



Source: UNODC, based on responses to the annual report questionnaire.

The Americas, followed by Africa, continue to report the majority of cannabis herb seizures

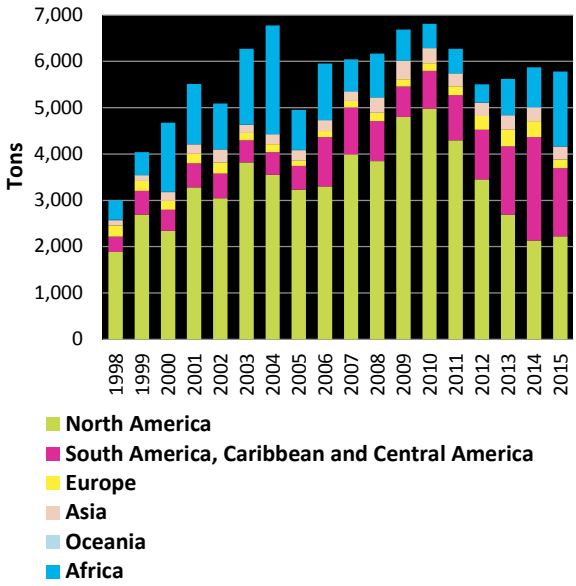
In 2015, almost two thirds (64 per cent) of the total quantity of cannabis herb seized worldwide was seized in the Americas, most notably in Mexico, followed by the United States, Paraguay and Brazil. Accounting for more than a quarter (28 per cent) of the global total, the second largest seizures of cannabis herb were reported in Africa, mostly in Nigeria, Egypt and Morocco. Asia accounted for 5 per cent of the total quantity of cannabis herb intercepted worldwide in 2015, most of which was seized by India, followed by Bangladesh, Kazakhstan, Indonesia and Thailand; 3 per cent of the total was seized in Europe, mostly by Turkey, followed by the United Kingdom, the Russian Federation, Spain and the Netherlands; and 0.1 per cent of the total was seized in Oceania, mostly in Australia.

The subregion reporting the largest quantity of cannabis herb seized in 2015 remained North America (39 per cent of global seizures). Following a peak in 2010, however, seizures of cannabis herb in North America declined by 55 per cent up to 2015 (despite rising levels of cannabis consumption), reflecting a possible fall in cannabis production in Mexico,[48] as well as an overall reduction in the priority given to cannabis interdiction as the cultivation, production, trade and consumption of cannabis has become legal in several jurisdictions in the United States in recent years.

By contrast, cannabis herb seizures more than doubled over the period 2010-2015 in Africa and South America. Meanwhile, cannabis herb seizures

48 This is in line with a decline in cannabis eradication reported by Mexico and, more importantly, with falling cannabis herb seizures along the Mexico-United States border over the period 2010-2015. While seizures of most drugs along that border have increased in recent years, cannabis herb seizures, in terms of both quantities and number of seizure cases, fell significantly between 2010 and 2015. Quantities of cannabis herb seized along the Mexico-United States border fell from more than 1,300 tons in 2010 to 900 tons in 2015 (United States Drug Enforcement Administration, *2016 National Drug Threat Assessment,* p. 135). Note that none of the states bordering Mexico had legalized cannabis over the period 2010-2015 and that cannabis continues to be prohibited at the federal level in the United States, which suggests that reduced seizures along the Mexico-United States border may have been the result of lower trafficking flows of cannabis herb from Mexico to the United States.

FIG. 24 | Quantities of cannabis herb seized, by region/subregion, 1998-2015



Sources: UNODC, responses to the annual report questionnaire; and government reports.

remained relatively stable in Asia and in Europe, with increases and decreases of less than 15 per cent. The main sources of cannabis herb in Europe are within the region itself, most notably the Netherlands and Albania, although the European Police Office (Europol) has also identified Czechia as an important distribution hub for cannabis herb trafficked to neighbouring countries.[49]

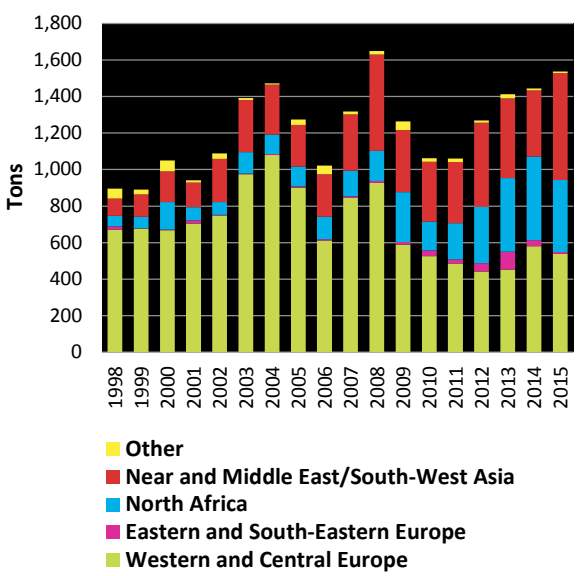
The largest quantities of cannabis resin intercepted continue to be reported in West and Central Europe, the Near and Middle East/South-West Asia and North Africa

In most years of the past two decades, the largest seizures of cannabis resin have been reported in Western and Central Europe. In 2015, however, at 38 per cent of the global total, the largest amount of seizures of cannabis resin took place in the Near and Middle East/South-West Asia, most notably in Pakistan, Afghanistan and Iran (Islamic Republic of). The next largest seizures of cannabis resin took place in Western and Central Europe (35 per cent; with seizures mostly reported by Spain, followed by Italy and France), while 26 per cent of the global total was seized by countries in North Africa (most notably Morocco, followed by Algeria and Egypt).

In contrast to the slight decline in seizures of cannabis herb worldwide over the period 2010-2015, cannabis resin seizures actually increased, reflecting a twofold increase in interceptions in North Africa and substantial increases (78 per cent) in the Near and Middle East/South-West Asia. The opposite was observed in Europe, however, where the overall quantity of cannabis resin seized, as a proportion of the global total, declined from 77 per cent in 1998 to 53 per cent in 2010 and 35 per cent in 2015. This decline primarily reflects the falling market share of cannabis resin in the European cannabis market as cannabis herb, mostly from domestic European production, has been gaining in popularity.

Cannabis resin mainly continues to be smuggled from Morocco to Europe and to other countries in North Africa, as well as from Afghanistan to neighbouring countries, particularly Pakistan and the Islamic Republic of Iran. It also seems that cannabis resin produced in Lebanon supplies markets in other

FIG. 25 | Quantities of cannabis resin seized, by selected subregion, 1998-2015



Sources: UNODC, responses to the annual report questionnaire; and government reports.

49 Europol, *SOCTA 2017: European Union Serious and Organized Crime Threat Assessment*, p. 36.

countries in the Near and Middle East, most notably the Syrian Arab Republic, Jordan and Israel, as well as markets in Egypt, Cyprus and Turkey.

In addition to ongoing direct shipments of cannabis resin from Morocco to Spain and subsequent shipments by land to France, Italy and the Netherlands, for further distribution to other European countries, Europol has reported an emerging trafficking route from Morocco to Libya (either by sea or by land) and then on to Italy. Although both UNODC and Europol data estimate that most of the cannabis resin found in Europe continues to originate in Morocco, it seems that Afghan cannabis resin is also trafficked to Europe, often using Albania as a first distribution hub.[50]

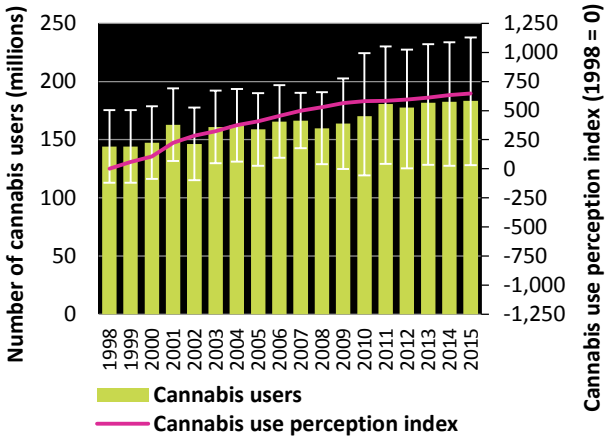
Cannabis use has remained quite stable at the global level in recent years, despite indications that it continues to increase in Africa and Asia

Equivalent to an estimated 183 million annual users in 2015 (range: 128-238 million), roughly 3.8 per cent of the global population (2.7-4.9 per cent) used cannabis in the past year. This proportion has not changed over the past decade and is only slightly higher than the prevalence of cannabis use estimated for 1998 (3.4 per cent). Nonetheless, as the world population has grown, so has the number of cannabis users (by 28 per cent since 1998). Analysis of the perception of changes in drug use, as reported by Member States, also suggests an increase in the number of cannabis users, although the increase appears to have slowed down since 2010. Cannabis use in Africa and in Asia, however, are perceived to have continued to increase relatively rapidly in the past five years.

Cannabis use continues to increase in North America

Data on the prevalence of cannabis use and expert perceptions suggest that cannabis use has been rising over the past decade in the Americas. UNODC estimates for the Americas show an increase from 37.6 million people (or 6.5 per cent of the population aged 15-64 years) who used cannabis in 2005[51] to 49.2 million (or 7.5 per cent of the population aged 15-64 years) in 2015. The rise in cannabis use appears to have been most pronounced in the United States, where, following some marginal declines in the prevalence of cannabis use between 2002 and 2007, the annual prevalence of cannabis use increased (by 34 per cent) to 13.5 per cent of the population aged 12 years and older over the period 2007-2015. This resulted in an overall increase of 43 per cent in the number of past-year cannabis

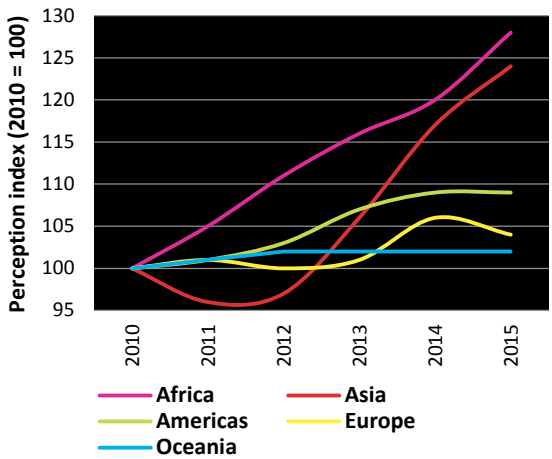
FIG. 26 Estimated number of cannabis users and cannabis use perception index, 1998-2015



Source: UNODC calculations based on responses to the annual reports questionnaire.

Note: For details of the calculation methods, see the online methodology section of the present report.

FIG. 27 Cannabis use perception index, by region, 2010-2015



Source: UNODC, responses to the annual report questionnaire.

50 Ibid., pp. 35 and 36.

51 *World Drug Report 2007* (United Nations publications, Sales No. E.07.XI.5), p. 114.

users, and of 54 per cent in the number of past-month users.[52] The major expansion in cannabis use across the United States has been the increase in regular and heavy cannabis users: the prevalence of daily or nearly daily use of cannabis among adults almost doubled from 1.9 per cent in 2002 to 3.5 per cent in 2015, and the number of daily or near-daily cannabis users grew by 67 per cent over the period 2007-2015.

Since 2002, the major increase in past-month cannabis use has been observed among those aged 26 years and older. An increase in the number of new initiates has also been seen among the older age groups, especially those aged 26 years and older.

The high prevalence and frequency of cannabis use observed among adults in the United States has been associated with those who perceive no risk of harm from cannabis smoking; with those from lower socioeconomic groups with no more than a high school diploma, without health insurance, and in part-time employment; those who are unable to work due to disability; those who are unemployed; and those who consider that the state in which they reside permits the medical use of cannabis.[53,54] Moreover, those who are daily or near-daily adult cannabis users without a college degree spend an average of almost 9 per cent of their household income on cannabis, while median past-month cannabis users spend on cannabis nearly the same amount as a person who smokes one pack of cigarettes a day spends on cigarettes for more details about cannabis use in the United States, see the following section.[55]

In Oceania, cannabis use in Australia increased slightly between 2007 and 2013, from an annual prevalence of 9.1 per cent to 10.2 per cent of the population age 14 years and older, although that was still significantly below the level reported in 1998 (17.9 per cent).

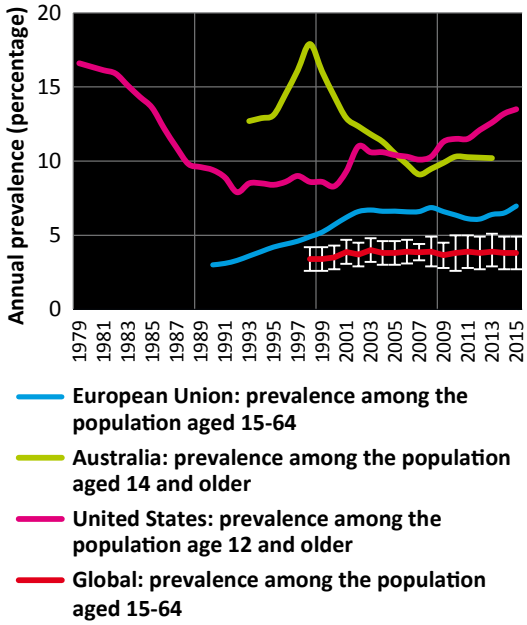
52 For more details, see subsequent discussion in this chapter.

53 Wilson M. Compton and others, "Marijuana use and use disorders in adults in the USA, 2002-14: analysis of annual cross sectional surveys", Lancet Psychiatry, vol. 3, No. 10 (2016), pp. 954-964.

54 Steven S. Davenport and Jonathan P. Caulkins, "Evolution of the United States marijuana market in the decade of liberalization before full legalization", *Journal of Drug Issues*, vol. 46, No. 4 (2016).

55 Ibid.

FIG. 28 Annual cannabis prevalence rates in the United States, the European Union, Australia, and at the global level, 1979-2015



Sources: UNODC, responses to the annual report questionnaire; SAMHSA, EMCDDA and the Australian Institute of Health and Welfare.

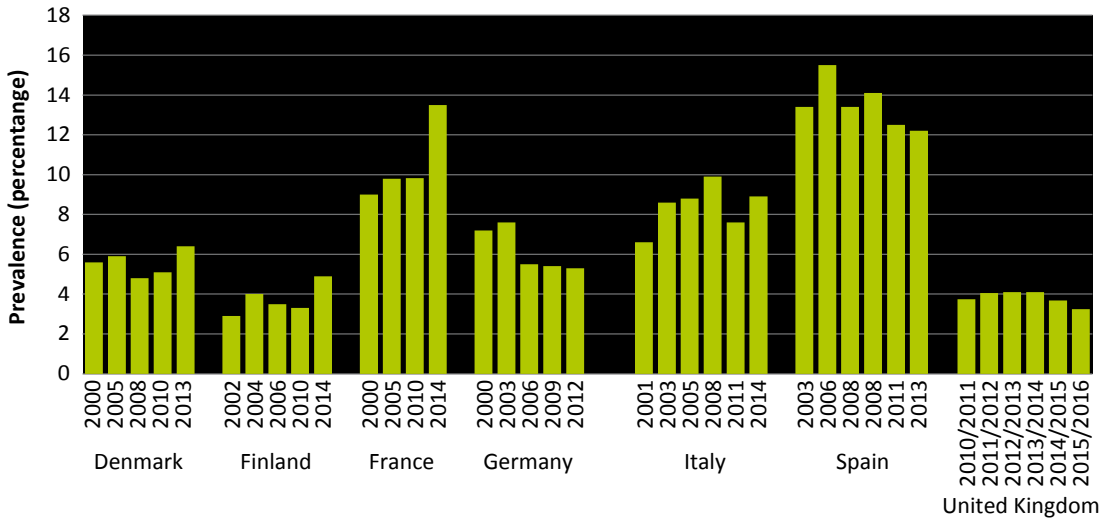
Cannabis use trends in Europe

The average past-year prevalence of cannabis use among the general population (aged 15-64 years) has remained stable over the past decade in the European Union member States, at around 6.6 per cent. However, at an annual prevalence of 13.3 per cent, cannabis use remains much higher among young people aged 15-34 years.[56] Around 3 million adults (1 per cent) in the European Union member States are estimated to be daily or near daily cannabis users, 70 per cent of whom are between 15 and 34 year of age and mostly male.

In the three countries with a high-prevalence of cannabis use, Germany, Spain and the United Kingdom (England and Wales), cannabis use has remained stable, while Denmark and France have experienced an increase in cannabis use. Many countries in Europe with historically low prevalence

56 EMCDDA, *European Drug Report: Trends and Developments 2016*, (2016 Luxembourg, Publications Office of the European Union, 2016).

FIG. 29 Trends in past-month use of cannabis among adults (aged 15-64 years) in selected high-prevalence countries



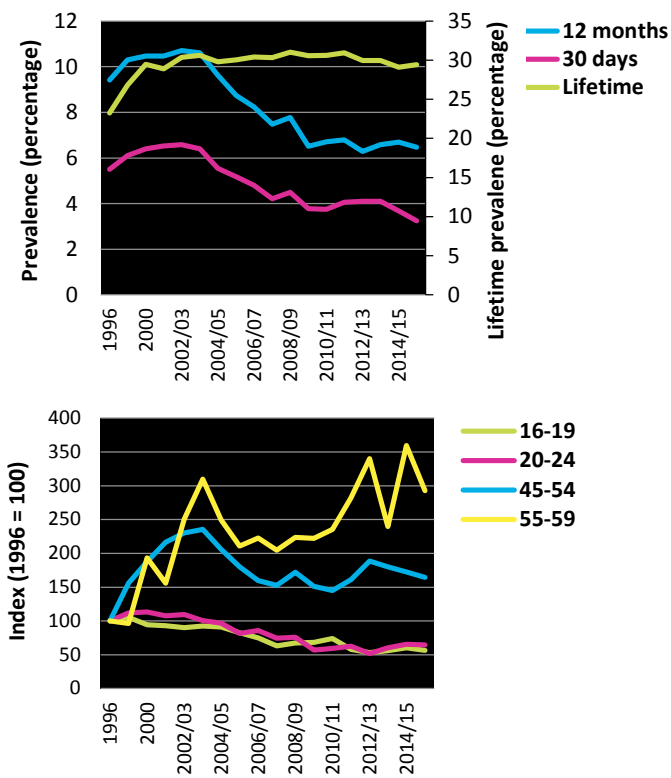
Source: EMCDDA, Statistical Bulletin, 2016.
Note: The data for the United Kingdom are from England and Wales only.

of cannabis use, such as Finland, have reported an increase in cannabis use in recent years and are now high-prevalence countries. Other countries in Europe that have shown an increase in past-year cannabis use in recent years include Bulgaria, Czechia and Sweden.[57]

Decreasing trend in cannabis use in England and Wales

Cannabis use in England and Wales has significantly declined over the past two decades. Although the annual prevalence of cannabis use remained stable between 2009/10 and 2015/16, at around 6.5 per cent of the adult population, the past-month prevalence of cannabis use decreased by 14 per cent over the same period. In 2015/16, less than half (47 per cent) of past-month cannabis users reported that they used the drug less than once a week, while only 14 per cent said they used cannabis daily or almost daily.[58]

FIG. 30 Trends in cannabis use in England and Wales, by age groups, 1996-2015/16



Source: Deborah Lader, ed., *Drug Misuse: Findings from the 2015/16 Crime Survey for England and Wales*, 2nd ed., Statistical Bulletin 07/16, (London, Home Office, 2016).

57 Ibid.

58 Deborah Lader, ed., *Drug Misuse: Findings from the 2015/16 Crime Survey for England and Wales*, 2nd ed., Statistical Bulletin 07/16 (London, Home Office, 2016).

Cannabis use is higher among younger age groups than older age groups, but it is increasing among older age groups

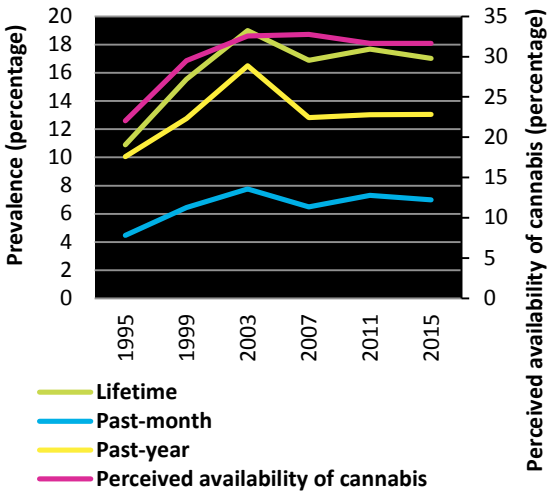
In England and Wales, there is a higher rate of cannabis use among young adults aged 16-19 years and those aged 20-24 years than among the older age groups, although both past-year and past-month prevalence have decreased significantly among young adults since 1996. Higher levels of cannabis use in the past-year were also reported among those adults who consumed alcohol three or more days a week in the past month, were unemployed or economically inactive, had a lower perception of risk of harm, as well as among those who visited nightclubs or bars/pubs on four or more occasions in the past month. While overall cannabis use is low among the older age groups (45-54 years and 55-59 years), there has been a significant increase among those age groups since 1996. Reflecting the ageing cohort of cannabis users that reported relatively higher cannabis use in the past, the past-year prevalence of cannabis use among 45-54 and 55-59 year olds has increased significantly: from 1.4 per cent and 0.5 per cent, respectively, in 1996, to 2.3 per cent and 1.5 per cent in 2015/16.[59]

Cannabis use among 15-16 year olds has declined in Europe

In 2015, the annual prevalence and past-month prevalence of cannabis use among 15-16 year olds in Europe was reported to be 13 per cent and 7 per cent, respectively;[60] on average, that age group had used cannabis 8 or 9 times in the past 12 months. Lifetime prevalence of cannabis use among adolescents varies from country to country, ranging from 37 per cent in Czechia and 31 per cent in France to 7 per cent in both Sweden and Norway. Contrary to the trends in the adult population, a decrease in the prevalence of cannabis use among adolescents was observed in Czechia, Denmark, Finland and France.

In Europe, a number of factors may play a significant role in determining the varying trends between countries in cannabis use among young people.[61] The perceived availability of cannabis and number of cannabis-using friends are positively related to cannabis use behaviours, while there is a negative correlation between perceived risk of harm in using cannabis and its actual use. The association between perceived cannabis use among peers and cannabis use among adolescents is stronger in European countries where access to cannabis is perceived to be difficult. The influence of the immediate social situation seems to be more strongly associated with cannabis use among 15-16 year olds than are distal influences related to the broader social environment.[62]

FIG. 31 Trends in cannabis use among 15-16 years old in Europe



Source: ESAPD Report 2015.

Increase in treatment of cannabis use disorders among young adults in Europe

In Europe, there was a 50 per cent increase from 2006 to 2014 in the number of first-time entrants for treatment of cannabis use disorders. The vast majority (86 per cent) of people entering treatment primarily for cannabis use disorders were aged 34 years or younger, with the mean age being 25

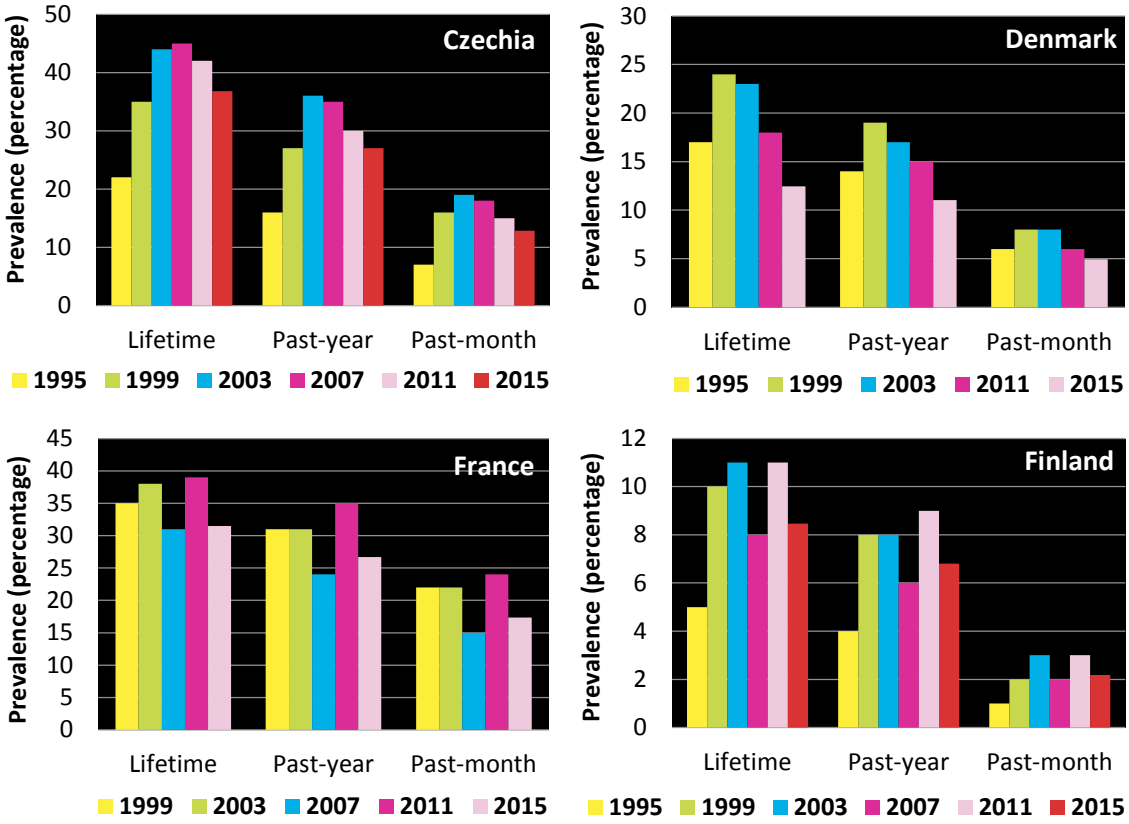
59 Ibid.

60 EMCDDA and European School Survey Project on Alcohol and Other Drugs, *ESPAD Report 2015: Results from the European School Survey Projects on Alcohol and other Drugs* (Lisbon, 2016).

61 Daniela Piontek and others, "Individual and country-level effects of cannabis-related perceptions on cannabis use: a multilevel study among adolescents in 32 European countries", *Journal of Adolescent Health*, vol. 52, No. 4 (2013), pp. 473 -479.

62 Ibid.

FIG. 32 | Trends in cannabis use among 15-16 year olds in selected countries



Source: ESAPD Report 2015.

years.[63] This increase in treatment of cannabis use disorders can be attributed to the availability of more harmful and higher-potency cannabis products — which are in turn associated with an increase in the severity of dependence and disorders — as well as to an increase in the availability of treatment and referral practices.[64, 65, 66, 67]

63 EMCDDA, "Perspectives on drugs: characteristics of frequent and high-risk cannabis users" (Lisbon, 2013).

64 T. P. Freeman and A. R. Winstock, "Examining the profile of high-potency cannabis and its association with severity of cannabis dependence", *Psychological Medicine*, vol. 45, No. 15 (2015), pp. 3181-3189.

65 EMCDDA, *European Drug Report: Trends and Developments 2016.*

66 Jonathan Schettino and others, *Treatment of Cannabis-related Disorders in Europe,* EMCDDA Insights Series No. 17 (Luxembourg, Publications Office of the European Union, 2015).

67 See *World Drug Report 2016.*

Developments in measures regulating recreational cannabis use in the United States and Uruguay

This section reviews trends in cannabis use in the United States, where there has been state-level legalization of cannabis cultivation and sale for recreational use in some states and for medical use of cannabis in others. The *World Drug Report 2016* looked at the outcome of cannabis legislation in terms of developments in public health, public safety, criminal justice and cannabis markets. This section presents some further developments in cannabis legislation in the United States and, in particular, reviews the extent of exposure of the adult and youth populations to cannabis, as well as the interplay between the use of cannabis for recreational and medical purposes. The section also provides a brief update on the status of implementation of cannabis regulation in Uruguay.

Preferences and patterns of use of plant-based cannabis and synthetic cannabinoids

The emergence of synthetic cannabinoid receptor agonist sold under names such as "Spice" and "K2", as new psychoactive substances, was first reported in 2004 and they have since been increasingly reported in different parts of the world. Synthetic cannabinoids comprise different products with chemical structures dissimilar to tetrahydrocannabinol (THC) (the principle psychoactive constituent of natural cannabis).

Effects of synthetic cannabinoid receptor agonists

There is growing recognition and reporting of the harm associated with intoxication with synthetic cannabinoids, which results in emergency room visits. The symptoms include tachycardia, psychosis, agitation, anxiety, breathing difficulties and seizures. The literature also shows that the use of synthetic cannabinoids has unpredictable negative psychological and physiological effects. Intoxication with some forms of synthetic cannabinoids can have severe effects; for instance, in an outbreak in New York, people reported experiencing "zombie-like" severe depressant effects after intoxication with the synthetic cannabinoid AMB-FUBINACA.

Experiences of cannabis users

The self-reported experiences of cannabis users who had recently used synthetic and natural cannabis show that almost all recent synthetic cannabinoid users reported that they had used natural cannabis, which they preferred over synthetic cannabinoids and used for a greater number of days. The use of synthetic cannabinoids is associated with more overall negative effects than the use of natural cannabis, including greater effects on the lungs, hangover effects and a greater level of anxiety and paranoia, as reported by users. Among those cannabis users, natural cannabis was considered to produce more memory impairment than synthetic cannabinoids, and was perceived to be more addictive. Natural cannabis was, however, considered a more consistent product than synthetic cannabinoids.

Overall, synthetic cannabinoids represent a diverse group of potent psychoactive compounds that are considered a substitute for natural cannabis but may result in acute intoxication and have long-term negative effects on health. Many cannabis users, such as those in prison settings, may substitute cannabis with synthetic cannabinoids to avoid sanctions (for details, see booklet 4 of this report). However, it cannot be concluded that the untoward or undesirable effects of synthetic cannabinoid receptor agonists will limit their uptake or use.

Sources:

Adam R. Winstock and Monica J. Barrat, "Synthetic cannabis: A comparison of patterns of use and effect profile with natural cannabis in a large global sample", *Drug and Alcohol Dependence*, Volume 131, Issues 1–2, 1 July 2013, Pages 106-111.

Adam R. Winstock and Monica J. Barrat, "The 12-month prevalence and nature of adverse experiences resulting in emergency medical presentations associated with the use of synthetic cannabinoid products", Human Psychopharmacology: Clinical and Experimental, July 2013, Volume 28, Issue 4, Pages 390-393.

Tracy L. Brewer and Margie Collins, "A review of clinical manifestations in adolescent and young adults after use of synthetic cannabinoids", *Journal for specialists in Pedriatic Nursing*, April 2014, Volume 19, Issue 2, p 119-126.

Axel J Adams and others, "'Zombie' Outbreak Caused by the Synthetic Cannabinoid AMB-FUBINACA in New York", *New England Journal of Medicine*, 2017; 376:235-242 January 19, 2017 DOI: 10.1056/NEJMoa1610300.

Recent developments in the United States

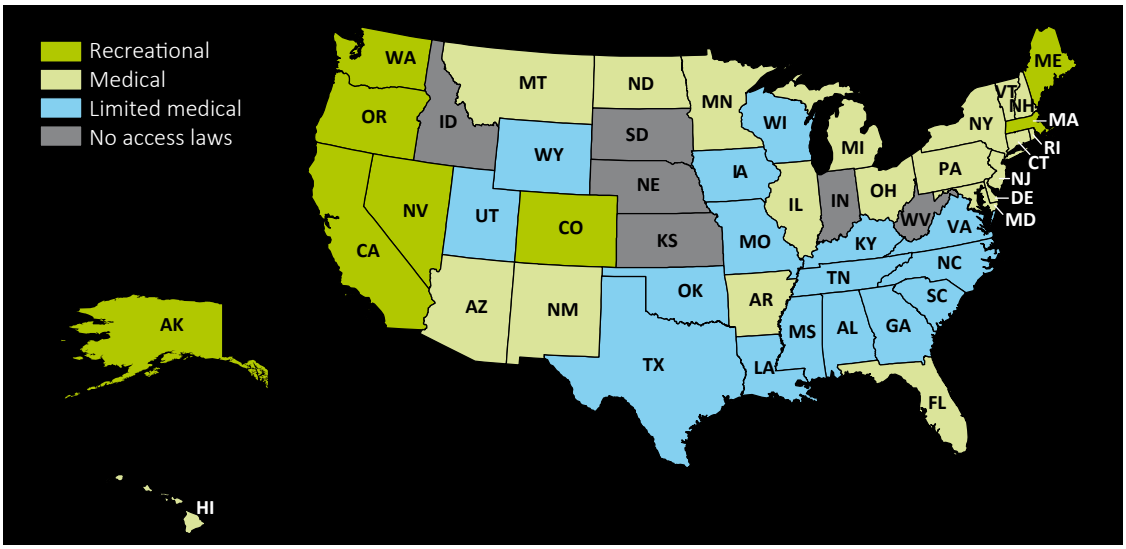
In 2016, voters in California, Maine, Massachusetts and Nevada voted to allow the legalization of cannabis for recreational use in their jurisdictions, while voters in one state rejected the proposition to legalize cannabis cultivation and use. The approved measures allow adults aged 21 years and older in those four states to possess cannabis for personal use and to grow cannabis plants at home. The total number of state-level jurisdictions that now allow use of cannabis for recreational purposes has grown to eight, plus the District of Columbia.[68, 69] Of much greater importance is that all those jurisdictions, not including the District of Columbia, are now licensing or are in the process of developing licensing schemes to enable for-profit companies to produce, market and sell a wide range of cannabis products. All of the states that have legalized cannabis use had prior measures allowing the medical use of cannabis.

The regulations that allow the sale and personal use of cannabis across the different jurisdictions permitting such measures differ in their provisions as well as in their implementation, as summarized in the annex of this booklet. Nevertheless, the states that voted in favour of the cultivation, sale and personal possession of cannabis for recreational use in 2016 have some measures that are similar to those passed by the four states that had previously permitted recreational cannabis use. These measures include: the establishment of a regulatory authority and a commercial system of production and supply

68 Home cultivation is not allowed in the State of Washington. The number of plants allowed in each state varies.

69 National Conference of State Legislatures (www.ncsl.org).

MAP 3 Jurisdictions in the United States that allow recreational use, medical use of cannabis and those that allow no access to cannabis



Source: Based on information from the National Conference of State Legislatures (NCSL) as of 12 May 2017.
Notes: The boundaries shown on this map do not imply official endorsement or acceptance by the United Nations.

by private enterprises; taxation at retail and, in some jurisdictions, at the production or cultivation levels; certain restrictions on advertisements; packaging and labelling restrictions on edibles; and measures concerning health and safety standards. California, Maine, Massachusetts and Nevada also allow on-premises consumption of cannabis at retail or specially licensed establishments.[70] As it is partly within the federal territory, the District of Columbia allows "home grown and home use" because people can still be arrested for possession of cannabis in the federal territory.[71] Many issues remain unresolved. The legislation that was approved in most of these states did not set a maximum limit on THC content, whereas states such as Oregon have since done so; other states such as California are in the rule-making process for the implementation of cannabis legislation.

In the 2016 election, voters in four other states, Arkansas, Florida, Montana and North Dakota, voted for measures to allow medical cannabis. In April 2017, West Virginia also passed legislation, making a total of 29 states that now have comprehensive laws allowing the production, sale and use of cannabis for medical conditions. These include the states with measures allowing the production and sale of cannabis for recreational use. In the District of Columbia, the law allows patients to obtain cannabis for medical use only from a dispensary licensed by the District's Health Department and does not allow patients or their caregivers to grow cannabis. A further 16 states have laws that allow the use of products containing low THC levels and/or high cannabidiol (CBD) levels for medical conditions such as epileptic seizures or seizure disorders.[72]

The evaluation of the impact of the measures allowing the commercial production, sale and recreational use of cannabis on health, criminal justice and other outcomes requires regular monitoring over time, and it may take years to determine their long-term effect on cannabis use and associated harm among adults, as well as their influence on cannabis use

70 BOTEC Analysis, "Cannabis report: the 2016 election and ballot initiatives", 26 October 2016. Available at http://botecanalysis.com/cannabis-the-election/; accessed 12 May 2017.

71 Department of Health of the District of Columbia, "Marijuana in the District of Columbia", LaQuandra S. Nesbitt and others, eds. (July 2016).

72 National Conference of State Legislatures, "State medical marijuana laws", 21 April 2017. Available at www.ncsl.org/research/health/state-medical-marijuana-laws.aspx.

Medical marijuana in the United States

Many countries have regulations that allow the use of cannabinoid-based medications. Similar to the approval of any pharmaceutical product, the approval of cannabinoid-based medications typically follows an established protocol in which clinical trials have proved the preparation to be effective for determined conditions and recommendations are made on dosages and conditions for use. In the United States, the approval of cannabis for medical purposes has followed a more complex pattern. The United States Food and Drug Administration (FDA), the federal agency in charge of approving medications for the United States market, has so far approved three non-botanical formulations based on the molecular structure of cannabinoids — dronabinol, a synthetic 9-tetrahydrocannabinol, its oral capsule and liquid formulations and, nabilone, a synthetic analogue of THC for oral use. Several additional cannabinoid-based medications — Sativex[a] (composed of THC and CBD), Epidiolex (cannabidiol oil) and another CBD oral solution were each granted Fast Track designations by FDA to facilitate development and expedite FDA review of their respective therapeutic indications.[b] According to the United States National Academies of Sciences, Engineering and Medicine, in California, clinical and preclinical trials of cannabinoids were initiated in 2000, with 13 out of the 21 approved studies completed. In Colorado, research on the medicinal benefits of cannabis products was initiated in 2015.[c]

As of May 2017, independent of the approval of pharmaceutical preparations, the use of cannabis products, such as herb (for vaporizing), extracts (tinctures), edibles and capsules for medical purposes, has been introduced in 29 states through statutory laws or constitutional amendments as voter initiatives, either through direct ballot or through state legislatures.[c] Although most states currently have, or had in the past, a therapeutic research programme, the cannabis products that are dispensed have not been developed through rigorous scientific processes. No products "developed" from state research programmes have received FDA approval. While the conditions that allow medical use of cannabis vary in each of those 29 states, most of the states require that a physician submit a signed form to the state regarding a person's eligibility for such use and most have a programme for registering patients for medical use of cannabis based on the physician's recommendation. In California and Maine, however, the registration of patients is considered voluntary or optional, whereas the state of Washington has no system for the registration of medical cannabis users in place. Many states such as California allow medical use of cannabis for a broad set of indications that may include any serious medical condition for which cannabis could provide relief.[d,e] In some states the law requires the state to produce and distribute cannabis products, including plants (for vaporizing), tinctures and capsules, in clinical settings, while in other states doctors are required to prescribe cannabis products and monitor the results. However, these measures have proved unworkable as they require physicians or clinics to violate federal law. While the states that allow medical use of cannabis have passed legislation regulating the production, sale and dispensation of medical cannabis, there are differences in the manner and length of time in which these measures have been implemented.

Although there are plans by the National Institute on Drug Abuse at the national level to provide a range of clinically relevant cannabis products for research, there are significant regulatory barriers for conducting such research on the health effects of different cannabis products. Also, those products need to be comparable with or relevant to the range of medical cannabis products used by consumers in the states where use of medical cannabis is permitted.[f] In most of those states the range of products currently available for medical purposes has not gone through the rigours of research in product development, clinical trials determining health effects, optimum dosage, standardized dosing, methods of administration and overall quality control measures employed for all pharmaceutical products.

a As of September 2016, Nabiximols has been launched in 15 countries and approved in a further 12.

b National Academies of Sciences, Engineering, and Medicine, *The Health Effects Of Cannabis And Cannabinoids: The Current State of Evidence and Recommendations for Research* (Washington, D. C, National Academies Press, 2017).

c Marijuana Policy Project, "State-by-State medical marijuana laws: how to remove the threat of arrest, 2015" (Washington, D. C, 2016).

d Rosalie L. Pacula and others, "State medical marijuana laws: understanding the laws and their limitations", *Journal of Public Health Policy*, vol. 23, No. 4 (2002), pp. 23, 413-439.

e Fairman, J, B., "Trends in registered medical marijuana participation across 13 US states and District of Columbia", *Drug and Alcohol Dependence*, 159 (2016) 72-79.

f National Academies of Sciences, Engineering, and Medicine, *The Health Effects of Cannabis and Cannabinoids.*

among adolescents.[73] Indeed, since the effects of changes in one state spill over and affect other states, there remain limitations to the evaluation of the effects of these policy changes due to extraneous factors.[74] One example of these limitations is the comparison of trends in the perceived risk of cannabis use in the states that have, and those that have not, legalized cannabis. Risk perceptions of harm negatively influence cannabis use behaviours and

73 Wayne Hall and Megan Weier, "Assessing the public health impacts of legalizing recreational cannabis use in the USA", Clinical Pharmacology and Therapeutics, vol. 97 (June 2015), pp. 607-615.

74 Wayne Hall and Megan Weier, "Has marijuana legalization increased marijuana use among US youth", *JAMA Paediatrics*, Vol. 171, No. 2 (February 2017), pp. 116-118.

are considered a protective factor; however, risk perceptions among the general population have declined over the years in the entire United States due to a number of factors, which include: the spillover effects of policy debates over legalization; an increase in cannabis use, which is perceived to be less risky among users; and the media coverage of the medical use of cannabis in many states.[75] In addition, legislation and contexts vary considerably across states that have passed legislation legalizing recreational and medical cannabis. Therefore, general analysis comparing states that allow recreational markets with those that do not has limitations.

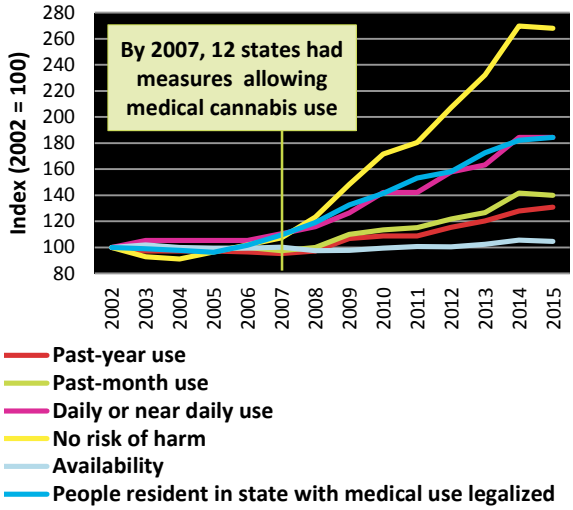
The following sections review some of these issues in an attempt to understand the influence of measures regulating cannabis production and use on behaviours related to cannabis use in the general population.

The approval of state-level cannabis regulations has occurred in an environment of overall increase in cannabis use across the United States

It is challenging to measure the health impact of the new regulations implemented by some of the states in the United States since cannabis laws have changed in concomitance with a series of other elements that have changed the cannabis market not only in the concerned states, but across the entire United States. Overall, cannabis use has increased in the United States among adults aged 18 years and older since 2002.[76] This has occurred in an environment with decreasing perceptions of risk of harm from cannabis use, in which some states have permitted the medical use of cannabis, and with extensive media coverage of state level debates around the medical use or legalization of cannabis for recreational use.

The increase in cannabis use has been among heavy users and those aged 26 years or older, in particular.[77] The high prevalence and frequency of cannabis use observed among adults has been associated with those who perceive no risk of harm from cannabis smoking; among those from lower socioeconomic groups; and those residing in a jurisdiction that permitted the medical use of cannabis.[78, 79] According to data from the National Survey on Drug Use and Health (NSDUH), the past-month prevalence of cannabis use among the population aged 12 years and older in the United States increased from 6.2 per cent in 2002 to 8.3 per cent in 2015, with an estimated 22 million people aged 12 years and older being current (past-month) cannabis users in 2015.[80] Since 2008 there has been a consistent year-on-year increase in cannabis use among the

FIG. 33 United States: cannabis use patterns, risk perception, availability and medical cannabis among the population aged 18 years and older, 2002-2015



Sources: *Key Substance Use and Mental Health Indicators in the United States: Results from the 2015 National Survey on Drug Use and Health*,
and earlier surveys and adapted from Compton and others, "Marijuana use and use disorders in adults in the USA, 2002-14: analysis of annual cross sectional surveys", Lancet Psychiatry 2016; 3: 954-64.

Note: Compton and others analysed the trends in cannabis use from 2002-2014.

75 Ibid.

76 Alejandro Azofeifa and others "National estimates of marijuana use and related indicators – National Survey on Drug Use and Health", United States, 2002–2014. *MMWR Surveillance Summaries* 2016; 65, No. SS-11, pp.1-25. Available at http://dx.doi.org/10.15585/mmwr.ss6511a1.

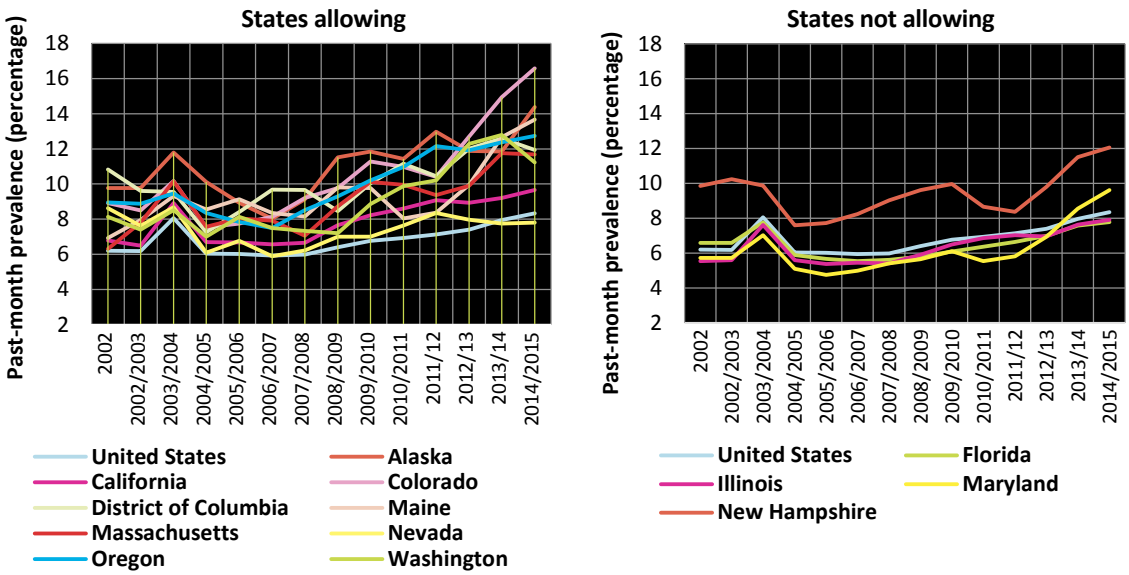
77 Wilson M. Compton and others, "Marijuana use and use disorders in adults in the USA, 2002-14: analysis of annual cross sectional surveys", *Lancet Psychiatry* 2016; 3: 954-64.

78 Ibid.

79 Davenport and Caulkins, "Evolution of the United States marijuana market".

80 Center for Behavioral Health Statistics and Quality, *"Key substance use and mental health indicators in the United States: Results from the 2015 National Survey on Drug Use and Health"* (HHS Publication No. SMA 16-4984, NSDUH Series H-51). Retrieved from http://www.samhsa.gov/data/.

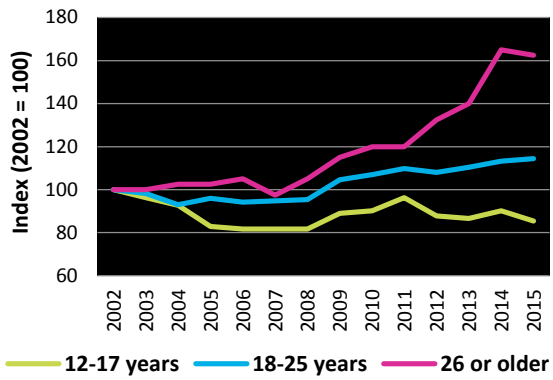
FIG. 34 Cannabis use in the past month among the population aged 12 years and older in the United States as a whole, in states with measures allowing recreational cannabis market, and other selected states, 2002-2015



Source: *Key Substance Use and Mental Health Indicators in the United States: Results from the 2015 National Survey on Drug Use and Health,* earlier surveys and SAMHSA State level estimates for the different years. Except for 2002, the state level estimates are presented as two-year averages. Alaska, Colorado, California, Maine, Nevada and Oregon had medical cannabis in 2000 or earlier.

population aged 12 years and older, particularly in those states that currently allow the production and sale of cannabis for recreational use among adults. In those states, rates of cannabis use higher than the national average have been observed, although they precede any measures to legalize cannabis. The increase in cannabis use, although not in all states, can also be seen in those states that have not legalized recreational use of cannabis. Overall, the increasing trend in cannabis use is considered to be associated with provisions of medical cannabis — with the evidence suggesting an overall reciprocal relationship between social attitudes and cannabis use patterns.[81] Beginning with California in 1996 and followed by Alaska, Oregon and Washington in 1998, 12 jurisdictions had made provisions for the medical use of cannabis by 2007. The cumulative effects of these policy changes might have led to changes in the risk perceptions of harm from cannabis use among the adult population and a subsequent increase in cannabis use.[82]

FIG. 35 United States: trends in cannabis use initiation in the past year, by age groups, 2002-2015

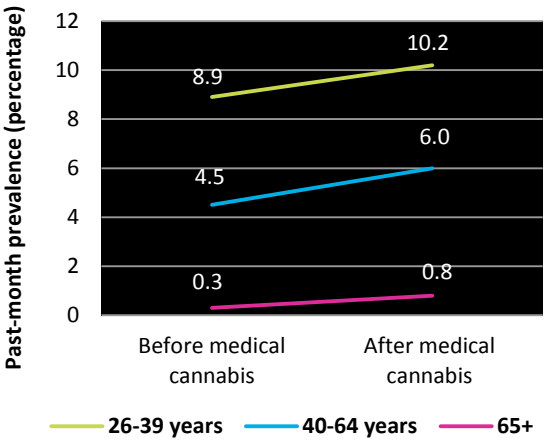


Source: Elaborated from NSDUH presented in Rachel N. Lipari and others, "Risk and protective factors and estimates of substance use initiation: results from the 2015 National Survey on Drug Use and Health" (SAMHSA, October 2016).

81 Rosalie L. Pacula and others, "Assessing the effects of medical marijuana laws on marijuana use: the devil is in the details", *Journal of Policy Analysis and Management,* vol. 34, No. 1 (2015), pp. 7-31.

82 Compton and others, "Marijuana use and use disorders in adults in the USA, 2002-14".

FIG. 36 Past-month prevalence of non-medical cannabis use among older age groups, prior to and following the legalization of medical cannabis use, 2004-2013



Source: Silvia S. Martins and others, "State-level medical marijuana laws, marijuana use and perceived availability of marijuana among the general US population", *Drug and Alcohol Dependence*, vol. 1 (December 2016), pp. 26-32.

Medical cannabis use regulations may have influenced the risk of adult non-medical cannabis use

Compared with the other states, those that allow medical use of cannabis have higher prevalence of past-month non-medical use of cannabis in all age groups. But laws that permit the medical use of cannabis appear, as yet, to have had little effect on the prevalence rate of recreational use of cannabis among adolescents, while they may have influenced the risk of non-medical cannabis use among the adult population.[83, 84, 85]

In the states that allow medical cannabis use, past-month non-medical use of cannabis increased significantly among the population aged 26 years and older from 5.8 per cent to 7.2 per cent over the period 2004-2013. Among the younger age groups (12-17 years and 18-25 years), however, changes in the prevalence of non-medical cannabis use were not statistically significant and not considered to be related to the measures that allow the use of cannabis for medical purposes.[86] Cannabis users living in the states that have measures allowing medical cannabis use also reported a higher perception of easy availability of cannabis. Although this perception has not changed among the younger age groups (12-17 and 18-25) since medical cannabis laws were introduced in those states, there has been a significant increase in the perceived easy availability of cannabis among those aged 26 years or older.[87] Past-month recreational cannabis use and the perceptions of easy availability of cannabis have increased significantly in all the older groups since the passing of medical cannabis laws.[88, 89]

Difference between recreational and medical users in the United States

In March 2016, around 1.2 million people were estimated to be registered for medical cannabis cards across the United States,[90, 91] which corresponds to eight medical cannabis patients per 1,000 population. The highest rates of registration per 1,000 population were in Colorado (19.8), California (19.4), Washington (19.2) and Oregon (19.2); states with the longest standing medical cannabis provisions.[92] However, these estimates should be considered with caution as several states do not maintain registries of medical cannabis.

83 Melanie M. Wall and others, "Prevalence of marijuana use does not differentially increase among youth after states pass medical marijuana laws: commentary on Stolzenberg et al. (2015) and reanalysis of US National Survey on Drug Use in Households data 2002–2011", *International Journal of Drug Policy*, vol. 29 (2016), pp. 9-13.

84 Deborah S. Hasin and others, "State medical marijuana laws and adolescent marijuana use in the United States: 1991-2014", *Lancet Psychiatry*, vol. 2, No. 7 (July 2015), pp. 601-608.

85 Silvia S. Martins and others, "State-level medical marijuana laws, marijuana use and perceived availability of marijuana among the general US population", *Drug and Alcohol Dependence*, vol. 1 (December 2016), pp. 26-32.

86 Ibid.

87 Ibid.

88 Ibid.

89 Alejandro Azofeifa and others "National estimates of marijuana use and related indicators – National Survey on Drug Use and Health".

90 Estimated number of medical cannabis users registered in 21 out of 23 states and the District of Columbia that have medical cannabis laws.

91 ProCon.org, "Number of legal medical marijuana patients (as of 1 March 2016)". Available at http://medicalmarijuana.procon.org/view.resource.php?resourceID=005889 (last updated on 3 March 2016).

92 The medical cannabis law in California was passed in 1996, in Oregon and Washington in 1998 and in Colorado in 2000.

In the United States, the National Academies of Sciences, Engineering and Medicine recently published *The Health Effects of Cannabis and Cannabinoids: the Current State of Evidence and Recommendations for Research*. A summary of NAS evidence of the therapeutic effects of products based on cannabis and cannabinoids and the statistical association between cannabis use and the incurrence of health conditions can be found in the annex of this booklet.

According to the National Academies of Sciences, Engineering and Medicine, there is evidence that medical use of cannabis-based products is effective for a limited number of conditions[93] (see the annex of this booklet). However, it is likely that in the medical cannabis system in place in the jurisdictions in United States, not all of the people who have a condition that may qualify for medical cannabis products are registered; conversely, many patients who are registered may not even have a medical condition.[94] Studies also suggest that younger registrants may be more likely to engage in the diversion of medical cannabis or may only be registered in order to circumvent the laws prohibiting recreational cannabis use, although the exact extent of this is not known.[95] Trends in the characteristics of people participating in medical cannabis programmes can help understand the public health and policy issues surrounding access to medical cannabis, although this information is not available uniformly in all states with such programmes.[96] Based on data from the states where multiple data points on registered medical cannabis use were available, the majority (between 50 per cent and 75 per cent) of patients registered in medical cannabis programmes were male. The age distribution of participants in eight states shows that a large proportion of registrants were in their 40s and 50s. However, this was different in states such as Colorado and Arizona where young adults (18-30 years) made up around one quarter of the participants in medical cannabis programmes.[97]

93 *The Health Effects of Cannabis and Cannabinoids.*

94 "Number of legal medical marijuana patients". Available at http://medicalmarijuana.procon.org/view.resource.php?resourceID=005889.

95 Fairman, "Trends in registered medical marijuana participation".

96 Ibid.

97 Ibid.

In many jurisdictions the medical cannabis market is used for both medical and recreational purposes. According to a national consumer panel survey of adults in 2014, more than one third of the respondents reported current use of medical cannabis for both medical and recreational purposes.[98] Those who use medical cannabis solely for medical purposes tend to use it for alleviating perceived medical symptoms in addition to alleviating anxiety, depression or other psychological symptoms.[99] Recreational cannabis users who access the medical cannabis market may be a heterogeneous group who use cannabis for different motives, including experimentation, coping and other social or psychological reasons.[100, 101] NSDUH data from 2013 and 2014 show that medical cannabis use was associated with the older age groups, poorer health status and with anxiety disorder.[102] Furthermore, among people reporting medical cannabis use the prevalence of daily or almost daily cannabis use was three times higher than among those reporting recreational use, although the same proportion (11 per cent and 10 per cent, respectively) of individuals who used cannabis recreationally or medically met the criteria for cannabis use disorders. Both groups had similar levels of depression, although medical cannabis users were less likely to meet the criteria for alcohol use disorder or to use other illicit drugs. Similarities in correlates of medical and non-medical cannabis users, especially co-occurrence of psychiatric conditions and other substance use, suggest that some cannabis users may access medical cannabis without a diagnosed medical need.[103, 104]

98 Gillian L. Schauer, and others, "Toking, Vaping, and Eating for Health or Fun Marijuana Use Patterns in Adults, U.S., 2014" *American Journal of Preventive Medicine*, vol. 50, No. 1, pp. 1-8 (January 2016).

99 Wilson M. Compton and others, "Use of marijuana for medical purposes among adults in the United States", *JAMA*, vol. 317, No. 2 (2017), pp. 209-211.

100 Lewei A. Lin and others, "Comparing adults who use cannabis medically with those who use recreationally: results from a national sample", *Addictive Behaviors*, vol. 61 (2016), pp. 99-103.

101 Wilson M. Compton and others, "Use of marijuana for medical purposes among adults in the United States", *JAMA*, vol. 317, No. 2 (2017), pp. 209-211.

102 Ibid.

103 Ibid.

104 Marcel O. Bon-Miller and others, "Self-reported cannabis use characteristics, patterns and helpfulness among medical cannabis users", *American Journal of Drug and Alcohol Abuse*, vol. 40, No. 1 (2014), pp. 23-30.

Has cannabis use among high school students changed in states that have legalized recreational cannabis use?

One important element in understanding the impact of legalizing recreational use of cannabis is to examine the extent to which such measures have influenced and affected the use of cannabis by adolescents. Current research on the subject remains inconclusive, however. National data show that, in contrast to the increase in cannabis use among adults, the prevalence of past-year and past-month cannabis use across the United States has declined among 8th and 10th grade high school students and has remained unchanged among twelfth graders in the past five years or so. Similarly, current daily use or near daily use has declined among 8th and 10th graders and has remained at similar levels among twelfth graders over the same period.[105]

Some studies have looked at state level data and concluded that past-year cannabis use is higher among twelfth grade students in states with laws permitting the use of cannabis for medical purposes than in states without such laws (38.3 per cent vs. 33.3 per cent), although these studies suggest that these differences precede those measures, presumably, in part, because states that allow the use of medical cannabis have had very liberal medical cannabis laws.[106, 107]

A study based on data from the Monitoring the Future survey compared trends in cannabis use among high school students in Colorado and Washington over the periods 2010-2012 and 2013-2015 with those in states that had not, at that time, legalized recreational use of cannabis.[108] The study showed that there was an increase in cannabis use among eighth and tenth graders in the state of Washington after cannabis had been legalized. In Colorado, cannabis use among eighth and tenth graders remained stable or decreased, while in states that had not legalized recreational cannabis use it declined. Past-month cannabis use among twelfth graders remained at similar levels in Colorado, Washington and in states that had not legalized recreational cannabis use. However, the data used in this study were not representative at state level. Different data from the State Healthy Youth Survey showed that the prevalence of cannabis use among tenth graders remained unchanged in Washington during the period 2001-2014.[109]

Different trends in different states could relate to exposure to the medical cannabis market. The expansion of for-profit dispensaries in Colorado had effectively legalized the commercial supply of cannabis before the laws were passed to allow for recreational use. Cannabis use among youth may not have changed as they would have already formed their attitudes and beliefs about cannabis use and were therefore less likely to be influenced by legalization measures.

Earlier studies found no differences in rates of change in cannabis use among youth or in the perceived risk of cannabis use between states that allow medical cannabis use and those that do not.[110, 111] It is not conclusive whether legalizing cannabis for recreational use among adults would influence its use among adolescents,[112] and further quality data and analysis representative at state level of long-term trends are required to address the question.

105 Lloyd D. Johnston and others, Monitoring the Future National Survey Results on Drug Use, 1975-2016: Overview, Key Findings on Adolescent Drug Use (Ann Arbor, Michigan, University of Michigan Institute for Social Research, 2017).

106 United States, National Institute on Drug Abuse, Monitoring the Future Survey: High School and Youth Trends (revised December 2016).

107 Deborah Hasin and others, "State medical marijuana laws and adolescent marijuana use in the United States: 1991-2014.

108 Magdalena Cerdá, and others "Association of state recreational marijuana laws with adolescent marijuana use", *JAMA Pedriatic*, vol. 171, No. 2 (February 2017).

109 Anar Shah and Mandy Stahre, "Marijuana use among 10th grade students – Washington, 2014". *Morbidity and Mortality Weekly Report,* 65 (30 December 2016), pp. 1421-1424. DOI: http://dx.doi.org/10.15585/mmwr.mm655051a1

110 Melanie M. Wall and others, "Adolescent marijuana use from 2002 to 2008: higher in States with medical marijuana laws, cause still unclear", *Annals of Epidemiology*, vol. 21, No. 9 (September 2011) pp. 714-716.

111 Sam Harper, Erin C. Strumpf and Jay S. Kaufman, "Do medical marijuana laws increase marijuana use? Replication study and extension", *Annals of Epidemiology*, vol. 22, No. 3 (March 2012), pp. 207-212.

112 Cerdá and others "Association of state recreational marijuana laws with adolescent marijuana use".

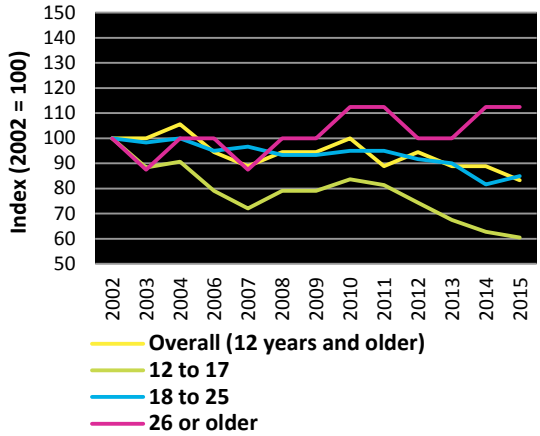
Has problematic use of cannabis increased as a result of increased cannabis use in the United States?

It has been noted that in the current environment of lower risk perceptions of harm from cannabis use and measures allowing the medical or non-medical use of cannabis, the number of new cannabis users among older adults, and/or of older adults resuming cannabis use, has increased. However, trends in cannabis use disorders are mixed. At around 1.5 per cent, the prevalence of cannabis use disorders[113] among the adult population (18 years and older) of the United States remained stable during the period 2002-2015, while the proportion of cannabis use disorders among regular adult users declined from 14.8 per cent in 2002 to 11 per cent in 2015.[114] Similar trends could be observed in the population aged 12 years and older: the proportion of cannabis use disorders among past-year cannabis users decreased by almost one third (from 16.7 per cent in 2002 to 11.9 per cent) in 2014).[115] The overall prevalence of cannabis use disorders among the population aged 12 years and older as well as among all the other age groups, except for those aged 26 years and older, declined during the period 2002-2015. It appears that the national trend was driven by large declines among the younger age groups, whereas adults aged 26 years and older actually experienced diverging trends, with increases in the prevalence of cannabis use disorders over the past few years.

There is no significant difference observed in the extent of cannabis use disorders among adults in the states that have measures for the medical or recreational use of cannabis and those that do not have such measures in place. However, the policy changes allowing the recreational use of cannabis may potentially increase cannabis use disorders among adults in the longer term.[116]

Cannabis use disorders are higher among those adults (18 years or older) without a high school diploma, among adults in part-time employment or not employed due to disability, among those who have never married, among those who have specific substance use disorders (tobacco, alcohol, cocaine and prescription opioids) and among adults who have experienced a major depressive episode.[117]

FIG. 37 Trends in cannabis use disorders among daily or near daily users in the United States, by age group, 2002-2015



Source: Key Substance Use and Mental Health Indicators in the United States: Results from the 2015 National Survey on Drug Use and Health

Cannabis regulation in Uruguay: provisions and recent developments

In 2013, the Government of Uruguay approved legislation (Law No. 19.172) regulating the cultivation, production, dispensing and use of cannabis for recreational purposes.[118] As the provisions regulating the recreational use of cannabis are being implemented gradually it is, however, too early to detect any effects from the regulations implemented to date.

113 Cannabis use disorder, according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) is defined as a problem-causing pattern of cannabis use leading to clinically significant impairment or distress, as manifested by at least two distinguishing symptoms (e.g., cannabis is taken in larger amounts or for longer periods than intended; experience of craving; continued cannabis use despite the experience of physical, social, or interpersonal problems caused by cannabis use) occurring within a 12-month period.

114 Data from the National Survey on Drug Use and Health as reported in Compton and others, "Marijuana use and use disorders in adults in the USA, 2002-14".

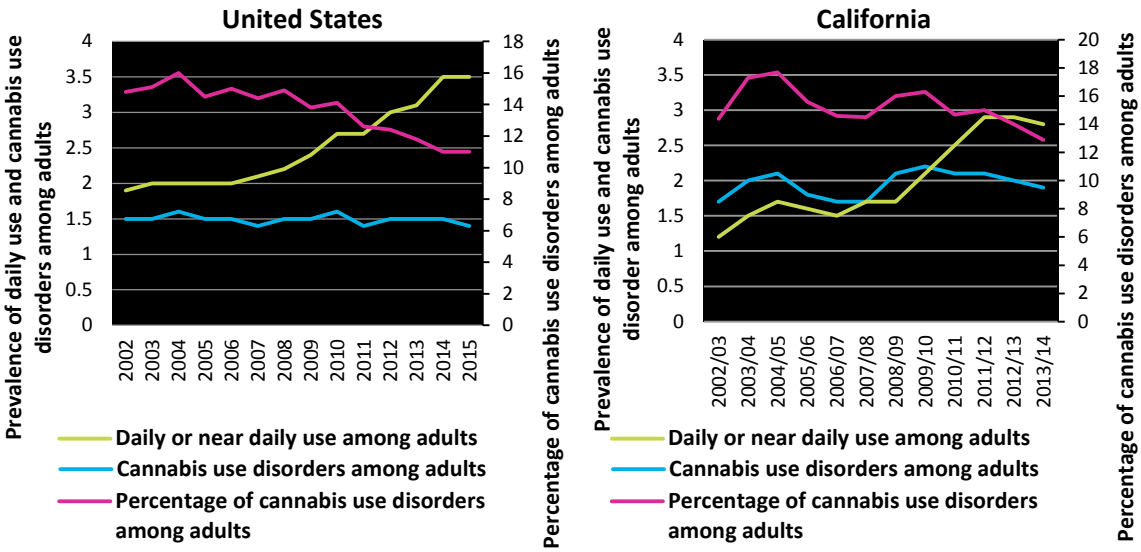
115 Alejandro Azofeifa, Margaret E Mattson, and others "National Estimates of Marijuana Use and Related Indicators — National Survey on Drug Use and Health", United States, 2002–2014. *MMWR Surveillance Summaries* 2016; 65 (No. SS-11):1–25. DOI: http://dx.doi.org/10.15585/mmwr.ss6511a1

116 bid.

117 Compton and others, "Use of marijuana for medical purposes among adults in the United States", pp. 209-211.

118 The main elements of regulation are given in the annex of this booklet.

FIG. 38 Prevalence and proportion of cannabis use disorders among daily or near daily adult (18 years or older) cannabis users, in the United States, 2002-2015



Sources: Wilson M. Compton and others, "Marijuana use and use disorders in adults in the USA, 2002-14: analysis of annual cross sectional surveys", *Lancet Psychiatry*, vol. 3, No. 10 (2016), pp. 954-964; Alejandro Azofeifa, Margaret E. Mattson and Rob Lyerla, "Supplementary material State level data: estimates of marijuana use and related indicators — national survey on drug use and health, California, 2002-2014" (Rockville, Maryland, Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, (2016).

Since adopting the legislation, the Government has passed a number of additional decrees and ordinances concerning the regulation of specific elements such as regulating the medical use of cannabis, the marketing of non-medical cannabis through pharmacies, as well as the registration of users, marketing and dispensation of cannabis for recreational use, etc.

In accordance with the Uruguayan legislation, cannabis for recreational use can be obtained via registration with the national Institute for Regulation and Control of Cannabis (IRCCA) by opting for one of the three options: pharmacies, clubs or individual cultivation. Since the adoption of the law, some aspects of cannabis regulation have been implemented while other aspects, such as dispensation through pharmacies and commercial production, are being considered with provisions for monitoring compliance and controlling diversion. Key provisions and recent developments in each of these areas are summarized in the following sections.[119]

119 The information in this section is taken from the Institute for Regulation and Control of Cannabis.

Domestic cultivation

Domestic cultivation is meant for personal or shared use in a household in which each adult is allowed to cultivate up to six cannabis plants for personal consumption, with the final product not exceeding 480 grams in weight per year. The system for the registration of domestic cannabis cultivation was created in August 2014. Those who had already been cultivating cannabis had a period of up to six months to register with IRCCA. As of January 2017, 6,057 individuals had been registered for the domestic cultivation of cannabis – thus the production of 2,907 kg of cannabis had been authorized up until then.

Cannabis clubs

Cannabis clubs are registered and accredited as "civil associations" by the Ministry of Education and Culture and then registered with IRCCA for the purpose of collective cultivation, production and use of cannabis among their members. As of January 2017, 33 cannabis clubs had been registered in the country, each one with a minimum of 15 and a maximum of 45 adult members, with data about the club and

its members being protected. IRCCA has developed guidelines for operating conditions, infrastructure and other measures relating to cannabis clubs. A licence for cannabis cultivation is valid for three years, and each club can plant up to 99 cannabis plants, with an output proportional to the number of club members, and which may not exceed 480 grams of cannabis per person per year; any excess production is taken over by IRCCA. By the end of 2015, cannabis clubs had declared a total of 23.8 kg of cannabis produced; in 2016, they declared a total of 121.89 kg.

Sale through pharmacies

The dispensation of cannabis for recreational use will be allowed through "first class community pharmacies", as defined in the regulations and registered with IRCCA for the purpose. Although the dispensation of cannabis has not yet started, by February 2017, 83 pharmacies had expressed their interest, of which 14 had been registered. Pharmacies will sell cannabis exclusively to adults (18 years or older) who are registered in the system, with the total amount sold not to exceed 10 g per person per week or 40 g per month. Uruguayan citizenship or permanent residency in Uruguay is, however, required for registration. At the time of writing, the price of cannabis had been set at approximately $1.30 per gram, which may be readjusted at the time of dispensing.

Individuals registered for cannabis use through pharmacies

As also foreseen in other national laws and regulations, cannabis regulation in Uruguay recognizes the need for the protection of the personal data of those who are registered for personal cannabis use. IRCCA is developing a computer system for user registration that will use biometrics for the identification and validation of users. As foreseen by the law, the individual anonymization process will be reversible only at the request of a competent judge. At the time of writing, no individual had been registered to obtain cannabis through pharmacies.

Commercial production of cannabis

In August 2014, IRCCA began the process of soliciting the interest of potential producers and distributors of cannabis for recreational use through pharmacies. Interested parties were required to provide a detailed plan of production, facilities, varieties to be produced, phytosanitary management, records and quality control, product packaging and labelling conditions. The levels of THC, cannabidiol and cannabinol in proposed cannabis varieties have also been evaluated. Two enterprises have been granted a licence to produce 2 tons of cannabis each for distribution through pharmacies. The price for distribution from the producer to pharmacy has been established at $0.90 per gram, which will be adjusted annually. The product will be packaged with a maximum content of 10 g in containers that will preserve the product for a minimum of six months.

Limited scale of legal supply to date

As noted, only 6,057 individuals and 33 clubs with up to 45 members can now produce cannabis legally, potentially providing legal supply to only around 7,500 out of the estimated 140,000 past-month cannabis users who live in Uruguay. The impact of provisions regulating the recreational use of cannabis will only be evident after those have been fully implemented and will require close monitoring over time.