5. The cannabis market

5.1 Introduction

Cannabis remains the most widely produced and consumed illicit substance globally. The extent of the global cannabis problem did not change significantly in 2009, though the consumption estimates show a wider range. This is the result of some increases in cannabis use in the United States of America, Africa, South and Central America and Asia, though consumption in Canada, western Europe and Oceania remained stable or showed a decline.

In Europe, cannabis resin seizures are now at their lowest level for the last 10 years, whereas seizures of resin in North Africa have increased. The major cannabis resin-producing countries showed little evidence of changes in the production levels. Global herbal cannabis seizures have increased, principally due to increased seizures in the United States of America and Mexico, where data on use and cultivation also point to an increase in the availability of cannabis herb in the market.

There is more and more evidence that intensive exposure to cannabis products with high potency levels increases the risk of psychotic disorders (see text box). Some recent studies show that the average concentration of the major psychoactive substance in cannabis products (THC) is nowadays at higher levels than 10-15 years ago; however, data for the past five years show a stable trend in some countries although the pattern is not consistent for all products and all countries.

From a market perspective, both cannabis producers and users are apparently searching for more diversified products which are not only determined by different THC concentrations, but also by choices in 'flavours.' This diversification is illustrated by the rise of synthetic cannabinoids ('spice'). In a short time, these products have become popular among young adults and teenagers in Europe and the United States. While there are some indications that these products might cause more damage to the health of users, there is a need for more pharmacological and toxicological research in this area. At the same time, the large number of products being marketed as cannabinoids also challenges the control measures taken by regulatory authorities in the Member States, the World Health Organization, the International Narcotics Control Board and the Commission on Narcotic Drugs.

5.2 Consumption

UNODC estimates that in 2009, between 2.8% and 4.5% of the world population aged 15-64, corresponding to between 125 and 203 million people, had used cannabis at least once in the past year. Compared to the previous year, the lower and upper levels of the estimates have increased, thereby widening the range.[1] This is in part due to greater uncertainty in the estimates as there are limited recent or reliable prevalence data available from many countries in Asia and Africa.

1 In 2008, the annual prevalence was estimated between 2.9% and 4.3% of the population aged 15-64.

Table 36: Annual prevalence and estimated number of cannabis users, by region, subregion and globally, 2009

Region/subregion	Estimated number of users annually (lower)	-	Estimated number of users annually (upper)	Percent of population age 15-64 (lower)	-	Percent of population age 15-64 (upper)
Africa	21,630,000	-	59,140,000	3.8	-	10.4
East Africa	2,340,000	-	8,870,000	1.7	-	6.5
North Africa	4,780,000	-	10,620,000	3.6	-	8.0
Southern Africa	3,130,000	-	7,810,000	3.9	-	9.8
West and Central Africa	11,380,000	-	31,840,000	5.2	-	14.6
Americas	40,950,000	-	42,860,000	6.7	-	7.0
Caribbean	440,000	-	2,060,000	1.6	-	7.6
Central America	550,000	-	610,000	2.2	-	2.5
North America	32,520,000	-	32,520,000	10.7	-	10.7
South America	7,410,000	-	7,630,000	2.9	-	3.0
Asia	31,340,000	-	67,970,000	1.2	-	2.5
Central Asia	1,950,000	-	2,260,000	3.8	-	4.4
East/South-East Asia	5,440,000	-	24,160,000	0.4	-	1.6
Near and Middle East	6,060,000	-	12,360,000	2.4	-	4.8
South Asia	16,830,000	-	28,110,000	1.9	-	3.1
Europe	28,730,000	-	29,250,000	5.2	-	5.3
East/South-East Europe	5,980,000	-	6,380,000	2.6	-	2.6
West/Central Europe	22,750,000	-	22,860,000	7.1	-	7.1
Oceania	2,160,000	-	3,460,000	9.3	-	14.8
Global	**124,810,000**	-	**202,680,000**	**2.8**	-	**4.5**

Fig. 141: Estimated number of cannabis users by region, 2009

Source: UNODC.

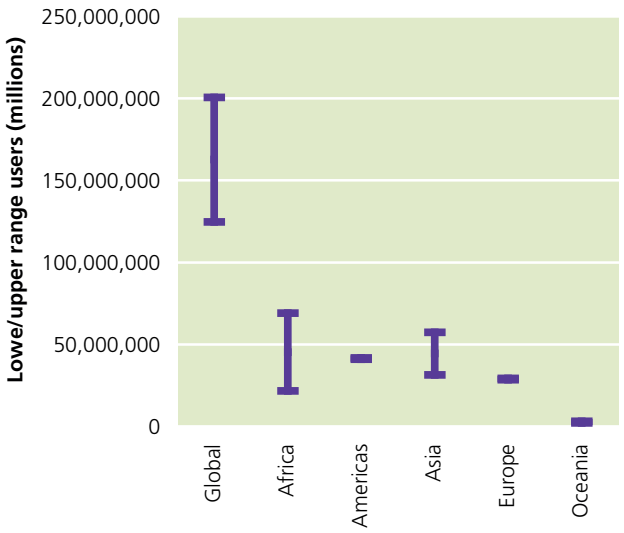
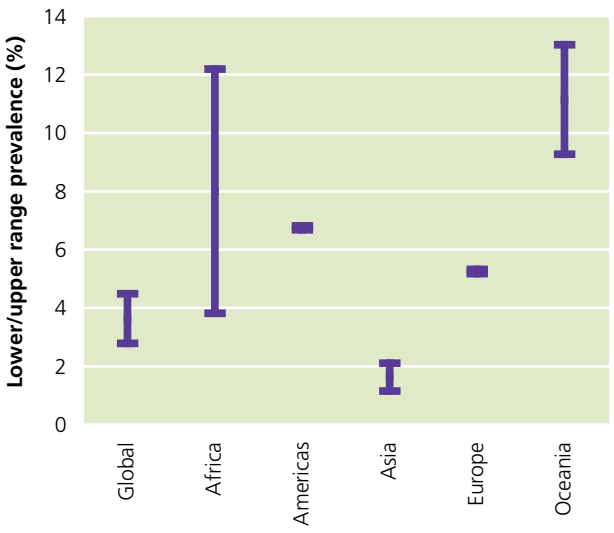


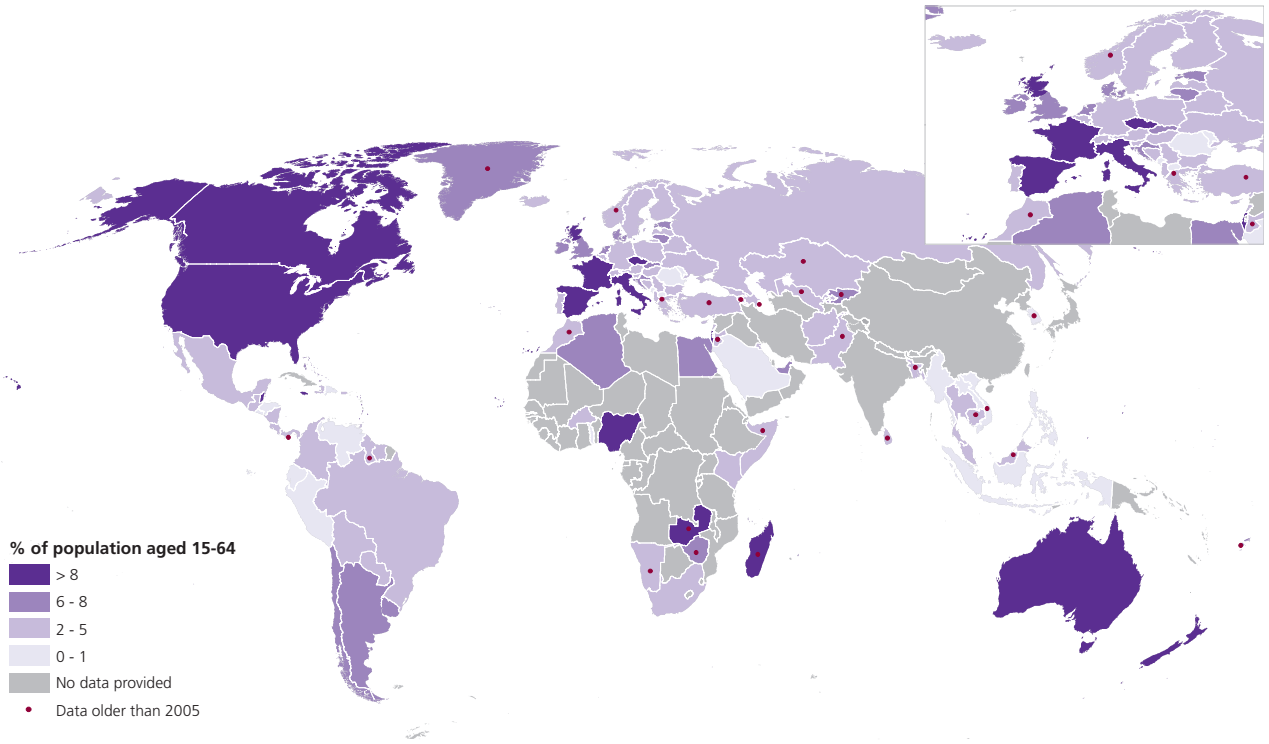
Fig. 142: Annual prevalence of cannabis users by region, 2009

Source: UNODC.



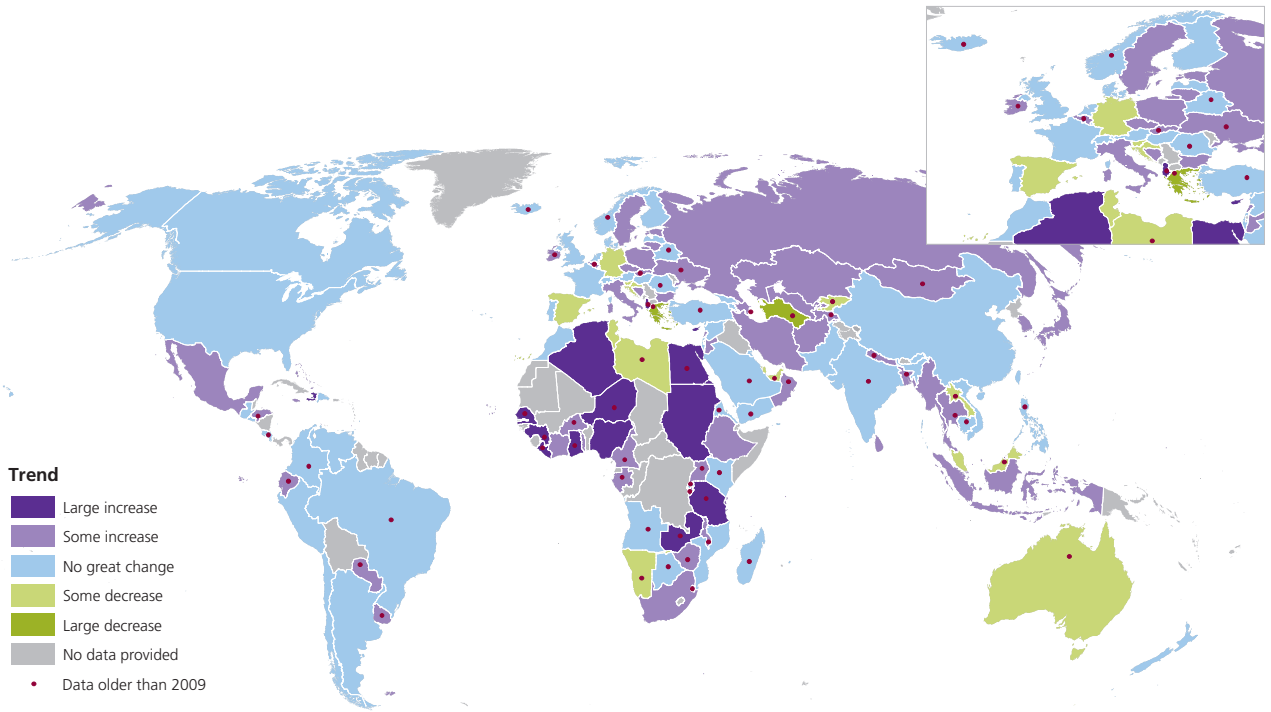
In 2009, among the Member States who provided expert perceptions on the trends of cannabis use in their countries, nearly half of the countries reported a stable trend. This number was even higher in countries in the Americas (67%). Less than half of Member States (44%), mainly in Africa, Asia and to a lesser extent Europe, reported that cannabis use had increased in their countries. As an overall trend, over the past 10 years, an increasing number of countries have been reporting stable trends for the use of cannabis.

Map 40: Prevalence of cannabis use, 2009 (or latest year available)



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.
Dotted line represents approximately the Line of Controlin Jammu and Kashmir agreed upon by India and Pakistan.The final status of Jammu and Kashmir has not yet beenagreed upon by the parties.

Map 41: Expert perception of trends in the use of cannabis, 2009 (or latest year available)



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.
Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan.The final status of Jammu and Kashmir has not yet beenagreed upon by the parties.

Cannabis users

The typology presented below is based on selected behavioural studies undertaken in a few developed countries (including the United States, Australia and the United Kingdom). It gives an indication of the risk factors and cannabis use patterns in some high-prevalence countries.

Experimental:

Experimental cannabis users typically try the drug for the first time in adolescence. They constitute a group of people who want to experience illegal drugs, but for the majority of these people, experience with cannabis suffices. A stage pattern suggests that 'experimenters' begin with alcohol and tobacco, followed by cannabis or inhalants.

Poor relations with parents, depression symptoms, exposure to drug-using peers and accessibility of drugs are important factors for initiation into illicit drugs. However, adolescents' beliefs and values favourable to the use of cannabis and association with cannabis-using peers are the strongest predictors of cannabis experimentation. Sensation-seeking in adolescence represents a propensity toward novel experiences and could also lead to the experimental use of cannabis. A number of experimental users may continue to use cannabis more regularly for recreational purposes or long-term to become chronic or dependent users.

Recreational:

During the last quarter of the twentieth century, recreational use of cannabis increased greatly across the world and came to be seen by larger numbers of young people as a *normal* leisure activity. Recreational users use cannabis mostly on weekends, are likely to have used or use other drugs and have a more active night life in the city than other users. These users report that the main purpose of their use of cannabis is to reach a 'social high' and that they also use it to relax, enhance activity, decrease boredom, increase confidence, reduce anxiety or feel better. These young people do not contact public or private addiction counselling services because they are at times unaware of their existence, do not consider themselves dependent or feel these services are not designed for their specific needs. Early repeated use of cannabis during adolescence may be a risk factor for chronic cannabis use.

Long-term or chronic:

People who start using cannabis at an early age and those who used other illicit drugs are more likely to continue using cannabis in their mid-30s or beyond, suggesting that cannabis use is part of their routine lifestyle choices. Lower income and marital rates, higher unemployment rates and having cannabis-using friends in young adulthood are commonly reported among this population.

Long-term cannabis users express lower levels of satisfaction on measures of quality of life. They report using cannabis to enhance positive feelings and perceive the drug as having calming effects, and may use it for stress-coping purposes. They also report using cannabis to escape from problems, alleviate anger or frustration, and 'get through the day'. Greater antisocial behaviour distinguishes chronic users from experimental and recreational users. It has been reported that psychosocial factors, antisocial personality disorder and alcohol dependence could predict long-term cannabis use. A social taboo against chronic drug use among women may be a protective factor, which is reflected in lower long-term female use rates.

References

Coffey, C., Lynskey M., Wolfe R. and Patton, G.C., 'Initiation and progression of cannabis use in a population-based Australian adolescent longitudinal study,' *Addiction*, Nov. 2000; 95(11): pp. 1679-1690.

Brook, J. S., Zhang, C. and Brook, D. W., 'Developmental Trajectories of Marijuana Use from Adolescence to Adulthood: Personal Predictors,' *Archives of Paediatric & Adolescence Medicine*, Jan. 2011; 165(1): pp.55-60.

Hall W. and Degenhardt, L., 'Adverse health effects of non-medical cannabis use,' *The Lancet,* 2009, Vol. 374, Issue 9698, pp. 1383-1391.

Duff, C., 'Party drugs and party people: examining the 'normalization' of recreational drug use in Melbourne, Australia,' *International Journal of Drug Policy*, 16, 2005, pp. 161–170.

Boys, A., Marsden, J. and Strang, J., 'Understanding reasons for drug use amongst young people: a functional perspective,' *Health Education Research,* 2001, 16 (4): pp. 457-469.

DiNitto D.M. and Choi, N.G., 'Marijuana use among older adults in the USA.: user characteristics, patterns of use, and implications for intervention,' *International Psychogeriatric Association,* Nov. 2010, 25: pp. 1-10.

Gruber, A.J. et al., 'Attributes of long-term heavy cannabis users: a case–control study,' *Psychological Medicine*, 2003, 33, pp. 1415–1422.

Perkonigg, A. et al. 'The natural course of cannabis use, abuse and dependence during the first decades of life,' *Addiction*, Mar. 2008;103(3): pp. 439-49.

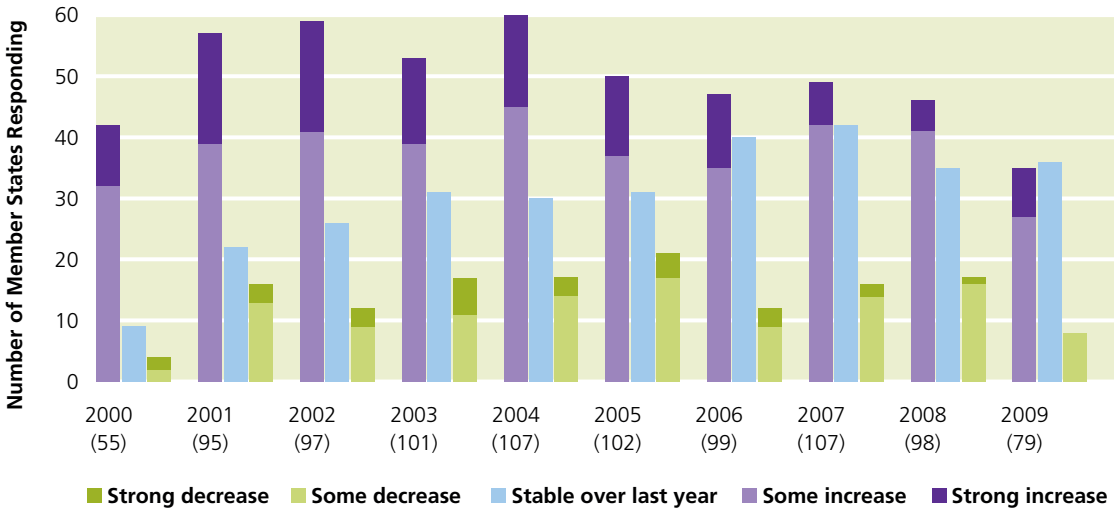
Table 37: Expert perceptions of trends in cannabis use by region, 2009

Source: UNODC ARQ.

Region	Member States providing perception data	Member States perception response rate	Use problem increased	Percent use problem increased	Use problem stable	Percent use problem stable	Use problem decreased	Percent use problem decreased
Africa	11	21%	7	64%	3	27%	1	9%
Americas	15	43%	5	33%	10	67%	0	0%
Asia	22	49%	11	50%	8	36%	3	14%
Europe	30	67%	12	40%	14	47%	4	13%
Oceania	1	7%	0	0%	1	100%	0	0%
Global	**79**	**41%**	**35**	**44%**	**36**	**46%**	**8**	**10%**

Fig. 143: Expert perceptions of trends in cannabis use, 2000-2009

Source: UNODC ARQ.



Cannabis use in the United States shows a resurgence, while there is a decrease in Canada

The annual prevalence of cannabis use in North America is estimated at around 10.7% of the adult population aged 15-64. These estimates are higher than the annual prevalence of 9.9% reported in the 2010 *World Drug Report*, and essentially reflect the increase in the annual prevalence of cannabis use in the United States of America.

In the United States, cannabis remained the most common illicit drug used in the past year. The annual prevalence of cannabis use that had been declining steadily between 2002 and 2007 begun to show an increase over the past two years, and in 2009 was estimated slightly higher than the prevalence in 2002.[2] Comparable trends of cannabis use have been observed both among the general population and high school students.

In 2009, among the people who had initiated drug use in the past year in the United States, the largest number - 2.4 million people aged 12 years or older - had used cannabis as their first drug. This was followed by the non-medical use of pain relievers (2.2 million). Among the estimated 22.5 million drug users who were classified with substance dependence or abuse in the past year, the highest number was among cannabis users (4.3 million people aged 12 or older).[3]

Past month prevalence of cannabis use among the US population aged 12 or older increased from 6.1% in 2008 to 6.6% in 2009. The rate of current illicit drug use, including cannabis, among the older population

2 Substance Abuse and Mental Health Services Administration, *Results from the 2009 National Survey on Drug Use and Health: Volume I.* Summary of National Findings, 2010, Rockville, Maryland, USA.

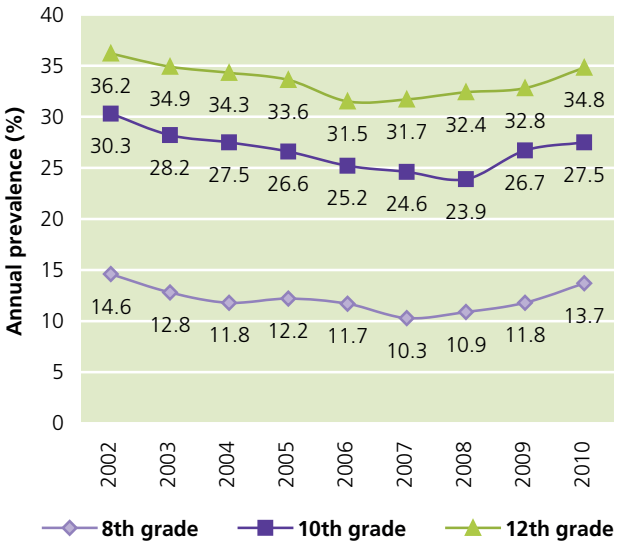
3 Ibid.

Fig. 144: United States: Trends in the annual prevalence of cannabis use among the population aged 12 or older, 2002-2009

Source: Substance Abuse and Mental Health Services Administration, Results from the 2009 National Survey on Drug Use and Health: Summary of National Findings.

Fig. 145: United States: Trends in the annual prevalence of cannabis use among secondary school students, 2002-2010

Source: Monitoring the Future: national results on adolescent drug use.



(aged 50-59) has also increased from 2.7% in 2002 to 6.2% in 2009,[4] mainly due to the ageing cohort of baby boomers[5] that have had high rates of illicit drug use. Among secondary school students in grades 8, 10 and 12, after some decreases observed between 2002 and 2006, there has been a steady increase in the annual prevalence of cannabis use since 2007. Use is still not reaching the levels reported in 2002, however.[6] The reversal in cannabis trends from 2006 onwards is in part attributed to a softening of the perceptions related to the risks of cannabis use among the student population,[7] which coincided with a period of public debates around an initiative aiming at the legalization of cannabis in one US state.

In 2009, among emergency department visits related to cannabis use, the rate was slightly higher for the population aged 20 years or younger (125.3 visits per 100,000 people) compared to those aged 21 or older (121.5 visits per 100,000 people).[8] For all other illicit drugs, the rate of emergency department visits was much lower among the younger population.

In Canada, the annual prevalence of cannabis use among the adult population remains at levels comparable to those in the United States, although the annual prevalence has been declining since 2004. In 2009 the annual prevalence was reported at 12.6%, a decrease from 13.6% in 2008 and 14.1% in 2004.[9] There has also been a decline in the annual prevalence of cannabis use among youth aged 15-24, from 37% in 2004 to 26.3% in 2009.[10]

There is no update on the extent of cannabis use in Mexico, but experts perceive an increase since 2008 when use was reported at 1% among the adult population. Cannabis use in Mexico remains at much lower levels than in the United States or Canada.

Some countries in South and Central America report increases in cannabis use

Cannabis use patterns and trends in the Caribbean, South and Central America remain unchanged, with the prevalence of cannabis use at comparable levels in these subregions. One third of the countries that reported expert opinions on trends of drug use considered that cannabis use in their countries had increased. Countries with high prevalence of cannabis use among the adult

4 Substance Abuse and Mental Health Services Administration, *Results from the 2009 National Survey on Drug Use and Health: Volume I.* Summary of National Findings, 2010, Rockville, Maryland, USA.

5 Baby boomers refers to the cohort of persons born in the United States between 1946 and 1964.

6 Johnston, L. D., O'Malley, P. M., Bachman, J. G. and Schulenberg, J. E., *Monitoring the Future, national results on adolescent drug use: Overview of key findings, 2010*, Institute for Social Research, University of Michigan, 2011, Ann Arbor, Michigan, USA.

7 NIDA, *Research Report Series: Marijuana Abuse,* US Department of Health and Human Services, National Institutes of Health, September 2010.

8 Substance Abuse and Mental Health Services Administration, Centre for Behavioural Health Statistics and Quality, The *DAWN Report: Highlights of the 2009 Drug Abuse Warning Network (DAWN) Findings on Drug-Related Emergency Department Visits*, December 2010, Rockville, Maryland, USA.

9 UNODC ARQ.

10 Health Canada, *Canadian Alcohol and Drug Use Monitoring Survey: Summary Results for 2009,* 2010.

Profile of clients in treatment with cannabis as the primary drug of concern in the United States (2000-2008)

Contrary to the general belief that cannabis use can result in little harm to users, in recent years, an increasing number of people in many regions have entered treatment for problems related to cannabis use. Presented below are some characteristics of a typical cannabis user entering treatment services in the United States, using data aggregated over the years 2000-2008. Based on this information, it can be inferred that cannabis users in treatment:

1. Are most likely adolescents or young adults, single and male with secondary-level schooling. One third of clients are less than 17 years old.
2. Are most likely not in the workforce, that is, unemployed or students.
3. Initiated their use of cannabis at a very young age - more than half by the age of 14 and almost 90% before the age of 18.

More than a quarter were daily users immediately prior to entering treatment, although more than a third had ceased use in the month prior to admission. The majority of referrals came through the criminal justice system.

Characteristic		% of total
Age	12-17	32.5
	18-24	32.5
	25+	34.9
Gender	Male	74.4
	Female	25.6
Marital status	Never married	80.5
Education	12 years or less	90.4
Employment status	Full time	19.2
	Part time	9.2
	Unemployed	25.3
	Not in labour force	46.3
	(of which 55.4% are students)	
Frequency of cannabis use	No use in past month	35.0
	1-3 times in past month	16.4
	1-2 times in past week	10.4
	3-6 times in past week	11.8
	daily	26.4
Age at first use	11 and under	13.6
	12-14	42.3
	15-17	31.2
	18-20	8.5
	21+	4.4
Source of referral	Individual (includes self-)	16.1
	Healthcare provider	10.3
	School	3.9
	Employer	1
	Community referral	11.5
	Court/criminal justice system	57.1
DSM diagnosis	Cannabis dependence	40.8
	Cannabis abuse	28.8
Psychiatric problem in addition to cannabis problem		23.2

Source: SAMHSA, Treatment Episode Data Set (TEDS).

population in these regions include Argentina, Belize, the Plurinational State of Bolivia, Chile and Guatemala. As observed in other regions, the prevalence of cannabis use in Central and South America tends to be higher among youth than in the general population. One exception is Guatemala, where the prevalence of cannabis use is higher in the adult population aged 15-64 (4.8%) than in the 12-19 age group (1%). In Argentina, the annual prevalence of cannabis use among the populations aged 15-64 and 13-17 is almost identical (7.2% and 7.6%, respectively).

Fig. 146: Annual prevalence of cannabis use among adult and youth* populations in selected countries in the Caribbean, Central and South America

* Youth: Argentina and Uruguay 13-17 years; Belize ages 13,15 and 17; Brazil, Chile and Colombia 15-16 years; Costa Rica grade 10; Ecuador 12-17 years; Guatemala 12-19 years.

Source: UNODC ARQ.

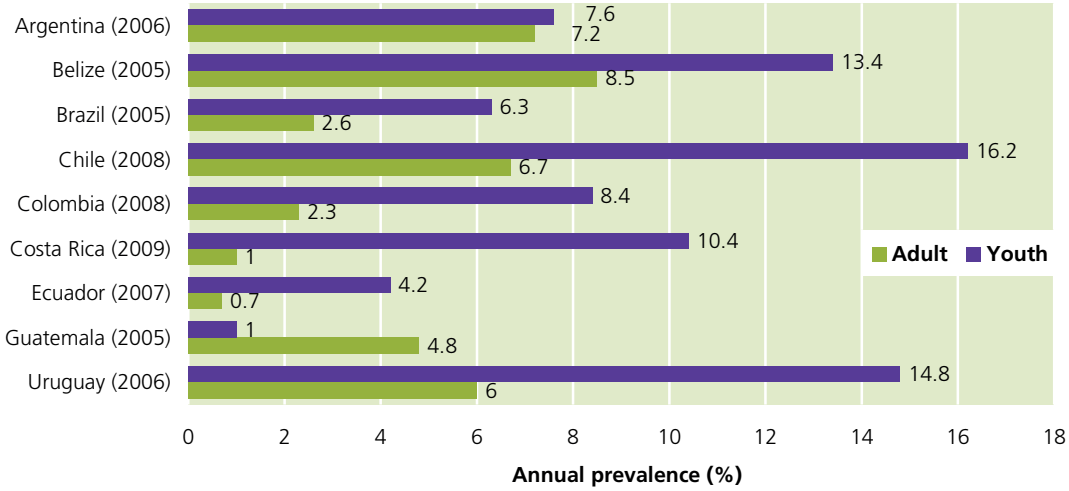
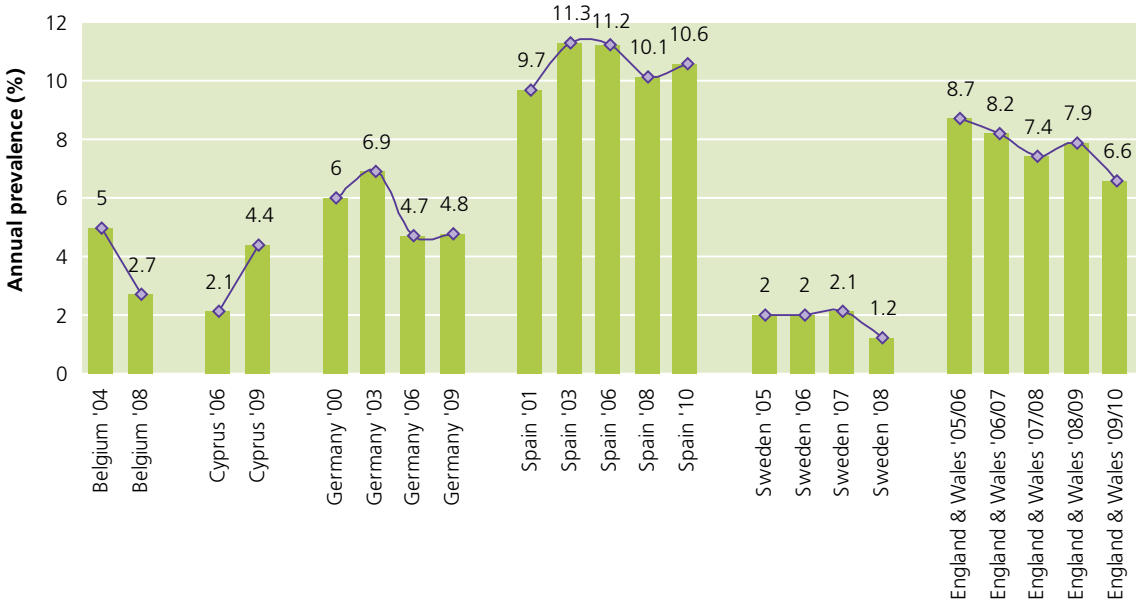


Fig. 147: Europe: Trends in annual prevalence of cannabis use in countries with new* data

* This refers to new or most recent data provided by Member States in 2010, either through the ARQ or in survey reports.

Source: UNODC ARQ; Government reports.



Most countries in Europe have shown stable or declining levels of cannabis use, but it is reportedly on the increase in eastern Europe

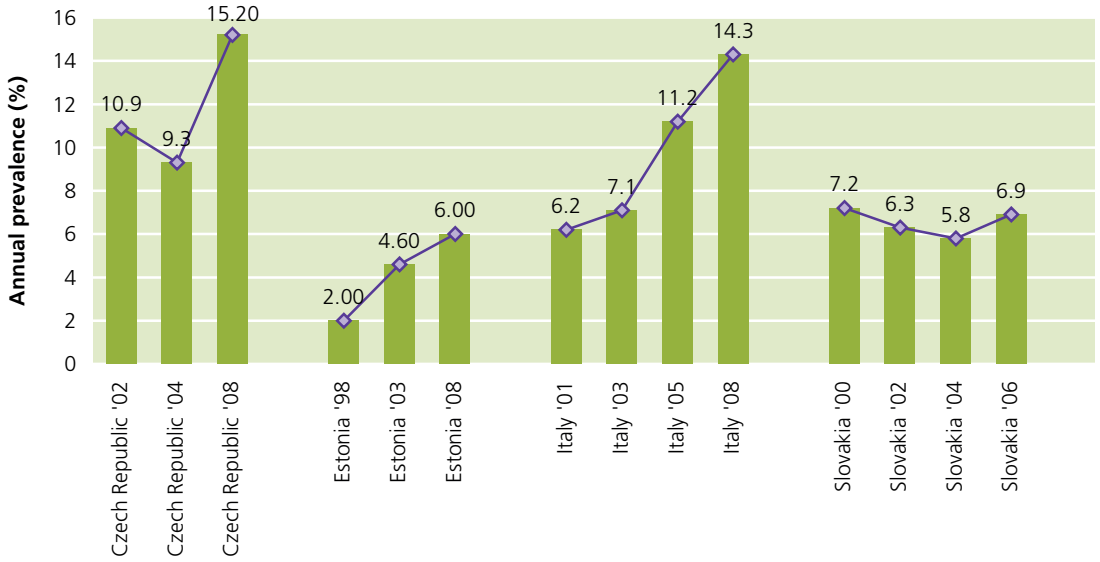
In some countries in eastern Europe, cannabis use exceeds the prevalence levels in western Europe. New data are available from a few countries in Europe, and they confirm the stabilization of cannabis use in West Europe. The Czech Republic, Estonia, Italy, Slovakia, Spain and the United Kingdom remain countries with high levels of cannabis use among the general population and among young adults with perceived trends of increasing use reported in recent years.[11]

In Europe, the annual prevalence of cannabis use is estimated at 5.2%-5.3% of the population aged 15-64. The prevalence of cannabis use is much higher in West and

11 A new household survey in Italy indicates a strong decline in annual prevalence from 14.3% in 2008 to 5.2% in 2009 as well as a parallel decline in the lifetime prevalence of cannabis use among the general population. The comparability of the findings between these two surveys, however, is uncertain.

Fig. 148: Trends in annual prevalence of cannabis use in high prevalence countries

Source: EMCDDA; UNODC ARQ.



Central Europe (7.1%) than in East and South-East Europe (2.6%). The use of cannabis is in large part concentrated among young people, with the highest annual prevalence reported among those aged 15-24 (13.9%), compared to an average annual prevalence of 10% among the population aged 15-34 in West, Central and South-East Europe.

The individual risk related to cannabis use seems lower than for heroin or cocaine, but health problems do exist and due to the high prevalence of use, the impact of cannabis on public health may be significant.[12] On average, cannabis was reported as the primary drug in treatment for 21% of cases in West and Central Europe and 14% of cases in East and South-East Europe. Cannabis was also reported as a secondary drug by 24% of all outpatient clients in Europe. Among the younger drug users (aged 15-19) in treatment, a much higher proportion (83%) were in treatment for primary cannabis use.[13] As reported by EMCDDA, many cannabis clients also report the use of alcohol or other drugs. Based on data collected in 14 EU member states, 65% of the cannabis users had taken another substance – mostly alcohol or cocaine – and some reported the use of both alcohol and cocaine in the previous year.

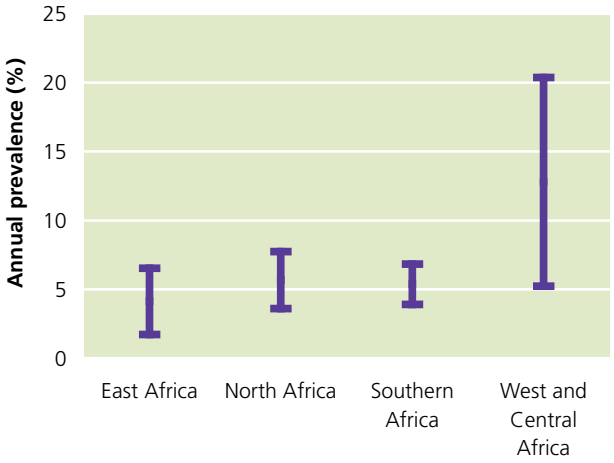
Although there is not much reliable information on the extent of cannabis use in Africa, it is perceived to be widespread, and most countries reporting expert opinion consider that cannabis use continues to increase

The estimated annual prevalence rates of cannabis use for Africa is the second highest in the world, with estimates ranging between 3.8% and 10.4% of the population aged 15-64, or between 21.6 and 59.1 million people. Higher levels of cannabis use are estimated for West and Central Africa compared to other subregions.

In Kenya, a 2009 survey conducted among 4,500 households in the coastal provinces indicated that the overall lifetime prevalence of cannabis use was 10.6% among all

Fig. 149: Annual prevalence of cannabis use in Africa by subregion, 2009

Source: UNODC.



12 European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) *Annual Report 2010: The State of the drugs problem in Europe*, Lisbon, 2010.

13 Ibid.

Cannabis use and psychosis

Evidence suggests that cannabis and other cannabinoids can produce a range of transient psychotic symptoms and cognitive deficits, such as transient deficits in learning, short-term memory, working memory, executive function, abstract ability, decision-making and attention. Increasing evidence also suggests that early onset and heavy cannabis exposure could increase the risk of developing a psychotic disorder such as schizophrenia.

In a case control study conducted by Di Forti et al. in the United Kingdom (2009), it was reported that patients with a first episode of psychosis were more likely to have smoked higher potency cannabis (that is, cannabis with higher THC content) with greater frequency and for a longer period. The study found that 78% of the case groups used the high potency cannabis (Sinsemilla or Skunk with THC concentrations ranging between 12-18% and 0% cannabidiol) compared with 37% of the control group (that smoked cannabis resin with both THC concentration and cannabidiol of 3.4%) (AOR* 6.8); were daily users (AOR = 6.4), and had smoked cannabis for more than 5 years (AOR 2.1).

Recent studies also indicate that cannabidiol reduces the acute cognitive effects of THC, an important aspect since the potency of cannabis has increased in Europe during the last 10 years and THC has been associated with the detrimental effects of cannabis on the mental health of at-risk users.

A recently published 10-year follow-up cohort study investigated the relationship between cannabis use and the subsequent development of psychosis over time and concluded that cannabis use was a risk factor for the development of incident psychotic symptoms. The study also concluded that continued cannabis use might increase the risk of psychotic disorder by impacting on the persistence of symptoms.

* AOR stands for Adjusted Odds Ratio, meaning that adjusting for age, gender, ethnicity, et cetera, those who had smoked higher THC content cannabis were 6.8 times more likely to report psychosis than the other group.

References:

Sewell et al, 'Behavioral, cognitive and psychophysiological effects of cannabinoids: relevance to psychosis and schizophrenia,' *Revista Brasileira de Psiquiatria*, Vol 32, Suppl I, May 2010.

Compton et al, 'Association of Pre-Onset Cannabis, Alcohol, and Tobacco Use With Age at Onset of Prodrome and Age at Onset of Psychosis in First-Episode Patients,' *American Journal of Psychiatry*, Nov. 2009; 166: pp. 1251–1257.

Arseneault et al, 'Causal association between cannabis and psychosis: examination of the evidence,' *British Journal of Psychiatry*, 2004, 184: pp. 110–117.

EMCDDA, *Insights: An overview of cannabis potency in Europe*, 2004.

Di Forti et al., 'High-potency cannabis and the risk of psychosis,' *British Journal of Psychiatry*, Dec. 2009; 195(6): pp. 488–491.

Ramaekers et al, 'High-Potency Marijuana Impairs Executive Function and Inhibitory Motor Control,' *Neuropsychopharmacology*, 2006, 31, pp. 2296–2303.

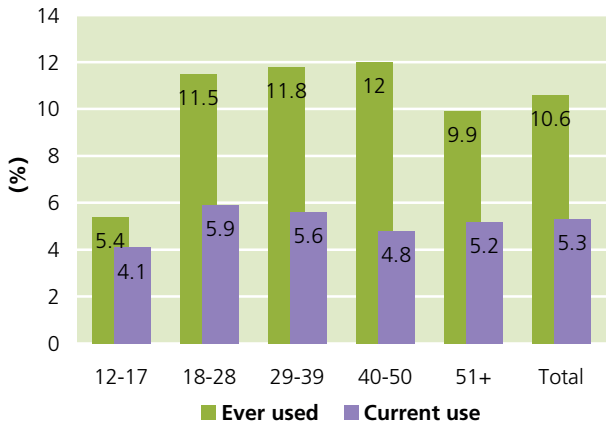
Morgan et al, 'Impact of cannabidiol on the acute memory and psychotomimetic effects of smoked cannabis: naturalistic study,' *British Journal of Psychiatry*, 2010, 197, pp. 285–290.

Henquet, C. and Kuepper, R., 'Does Cannabidiol protect against the negative effects of THC?,' *British Journal of Psychiatry*, 2010. 197: pp. 259–260.

Keupper et al, 'Continued cannabis use and risk of incidence and persistence of psychotic symptoms: 10-year follow-up cohort study,' *British Medical Journal*, 2011: 342:d738.

Fig. 150: Kenya: Lifetime and current use prevalence of cannabis by age group, 2009

Source: National Campaign Against Drug Abuse Authority (NACADA), Report of Survey on Drug and Substance Abuse in Coast Province Kenya – Main Report.



ages, with a much higher prevalence among the urban (11%) than the rural population (4%). The lifetime prevalence was at similar levels for all age groups except the 12-17 year olds, whereas the current use,[14] reported at 5.3% among all age groups, was fairly consistent.[15]

In terms of treatment demand, compared to the other regions, cannabis remains the most common primary drug for which drug users seek treatment in Africa. This proportion varies from nearly all treatment admissions in countries such as Botswana, Malawi and Ghana to around one third of treatment admissions in Kenya, Mozambique and South Africa.

14 Defined as use in the past 4 weeks before the interview.

15 National Campaign Against Drug Abuse Authority (NACADA), *Report of Survey on Drug and Substance Abuse in Coast Province Kenya – Main Report,* March 2010.

Fig. 151: Africa: Distribution of primary drug of people entering treatment, 2009*

* Total is greater than 100% due to polydrug use.
Source: UNODC ARQ.

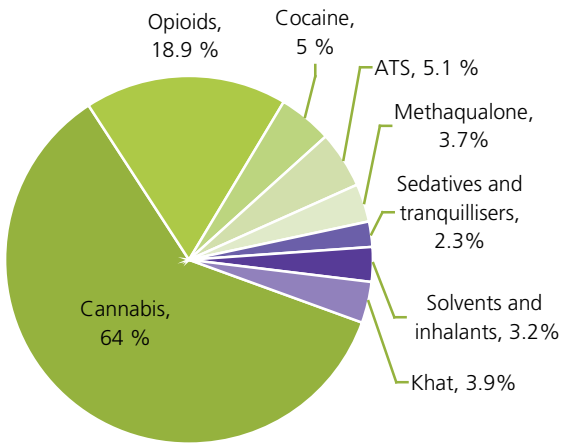
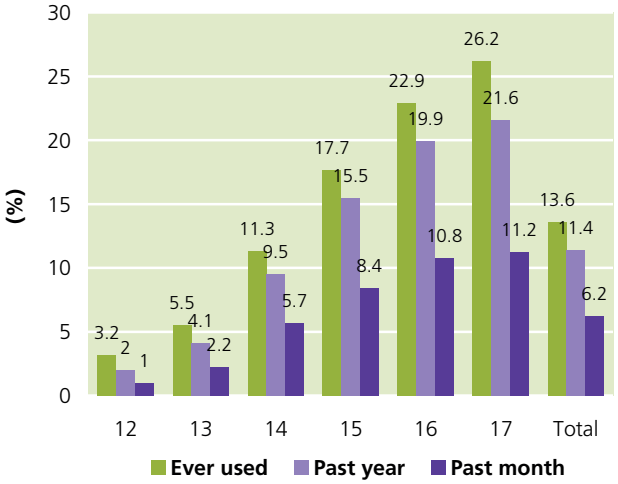


Fig. 152: Australia: Cannabis use among students, 2008

Source: Australian School Survey 2008.



Recent information on the extent of cannabis use from most parts of Asia - especially from countries with large populations such as China and India - is not available

Among the countries reporting expert opinions on trends of drug use, more experts considered that cannabis use had increased over the past year.

The annual prevalence of cannabis use in Asia is estimated at between 1.2% and 2.5% of the population aged 15-64. This corresponds to between 31 and 68 million people using cannabis at least once in the past year. In terms of prevalence, Asia has the lowest rate, but because of its population size, may have the largest absolute number of cannabis users globally. Most of the countries that reported an increase in cannabis use are in East and South-East Asia, whereas higher cannabis use prevalence is reported from Central Asia and the Near and Middle East.

Table 38: Asia: Member States reporting an increase in cannabis use, 2009

Source: UNODC ARQ.

Near and Middle East/ South-West Asia	East and South-East Asia	South Asia	Central Asia
Afghanistan	Brunei Darussalam	Sri Lanka	Kazakhstan
Jordan	Indonesia		Uzbekistan
Lebanon	Malaysia		
	Singapore		
	Thailand		

Cannabis use in Oceania remains at high levels, but shows decreasing trends in Australia and New Zealand

Oceania has one of the highest prevalence rates of cannabis use globally, ranging between 9.3% and 14.8% of the population aged 15-64. The main information on the extent of cannabis use from the region is available from Australia and New Zealand, and to some extent from the smaller Pacific Island states.

No new data on the prevalence of cannabis use among the general population in Australia has been reported. The annual prevalence was estimated at 10% of the population aged 15-64 in 2007, with an almost one fifth decline in cannabis use reported between 2004 and 2007. The lifetime prevalence of cannabis use among 12-17 year old students who participated in the Australian secondary school survey was 13.6% in 2008. This has declined from a lifetime prevalence of 17.8% in 2005 and 25% in 2002. Among the students who participated in the 2008 survey, the use of cannabis across all periods, that is, lifetime, past year and past month use, increased by age and was highest among the 17-year -old students.[16]

In Australia, cannabis was also the most common drug detected among police detainees, where 48% of all detainees tested positive for cannabis use in 2009. Among detainees who self-reported, 54% reported cannabis use during the past 12 months, with the highest proportion reported among the 21-25 age group.[17]

16 White, V. and Smith, G., *Australian secondary school students 'use of tobacco, alcohol, and over the counter and illicit substances in 2008*, Drugs Strategy Branch, Australian Department of Health and Ageing.

17 Gaffney, A., Jones, W., Seeney, J. and Payne J., *Drug Use monitoring in Australia: 2008 annual report on drug use among police detainees,*

For New Zealand, the latest information on cannabis use dates from 2008, when the annual prevalence was estimated between 13.4% and 15.7% of the population aged 16-64. As commonly observed, men (21%) were more likely to have used cannabis in the past year than women (13.9%). Among the adult population, the past year cannabis use was highest among younger age groups and decreased with increasing age in the adult population. The highest past year use prevalence was among men in the 18-24 year age group and for women in the 16-17 and 18-24 year age groups.[18]

As shown in previous years, high annual prevalence of cannabis use is reported from many Pacific Island states and territories, ranging from 24.2% in Palau or 22.2% in Northern Mariana Islands to around 5% in Fiji and Marshall Islands.

The emergence of synthetic cannabinoids in herbal products

In 2008, several synthetic cannabinoids were detected in herbal smoking blends which were sold on the internet and in specialized shops under a variety of brand names such as 'Spice Silver,' 'Spice Gold,' 'Spice Diamond,' 'Yucatan Fire' and 'Smoke.' These colourful and professionally designed herbal products typically contain about 3 grams of finely cut plant material to which one or more synthetic cannabinoids have been added.

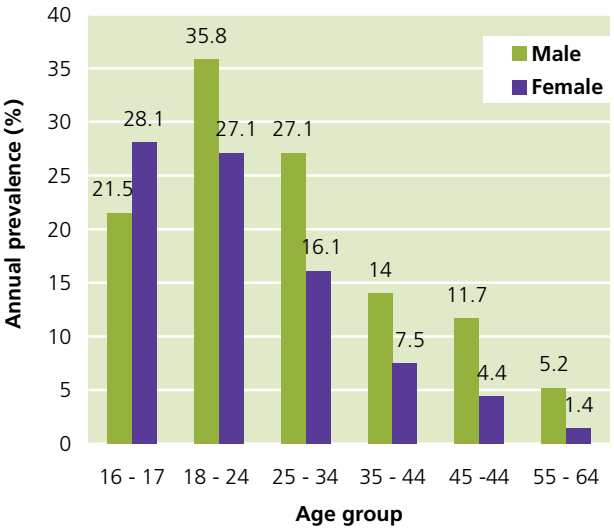
Before 2008, the use of these herbal products seemed to be restricted to a small number of experimental users. However, in 2008,[19] these products achieved immense popularity in Germany and other European countries through the internet and subsequent media reports, where they were referred to as 'legal alternatives' to cannabis, thus unintentionally promoting the use of these drugs.

The synthetic cannabinoids are generally administered by smoking either as a joint or in a water-pipe. These products do not contain tobacco or cannabis but when smoked were claimed to be able to produce cannabis-like effects.

Although so far, relatively little is known about the pharmacology and toxicology of the various (and frequently changing) synthetic cannabinoids that are added to the herbal mixtures, a number of these substances may have a higher addictive potential compared to cannabis due to quicker development of tolerance (see text box).

Fig. 153: New Zealand: annual prevalence of cannabis use by gender and age group, 2008

Source: Drug use in New Zealand, Key Results 2007/08 New Zealand Alcohol and Drug Use Survey, Ministry of Health 2010.



Currently, none of the synthetic cannabinoids found in these herbal products are internationally controlled under the 1961 or 1971 UN drug control conventions and at present, the control status of these compounds differ significantly from country to country. Most countries are challenged by the sheer number of synthetic cannabinoids constantly emerging, which means that control measures targeting individual compounds can be easily circumnavigated. Some Member States, for example, the United Kingdom, Ireland and Luxembourg, have adopted a more generic approach to controlling synthetic cannabinoids of similarly structured compounds. Nevertheless, effective implementation of control measures could be hampered by the lack of analytical data and reference samples, as well as methodologies for toxicological identification of metabolites in biological specimens.

Monitoring Reports 09, Australian Institute of Criminology.

18 Drug use in New Zealand, *Key Results 2007/08 New Zealand Alcohol and Drug Use Survey*, Ministry of Health, 2010.

19 Although a recent study showed a sharp decline in the use of spice in Germany, from 3% to 1% in 2009 (source: Abschlussbericht, Spice, Smoke, Sence & Co. – Cannabinoidhaltige Räuchermischungen: Konsum und Konsummotivation vor dem Hintergrund sich wandelnder Gesetzgebung, Goethe-Universität).

Chemistry and effects of synthetic cannabinoids

Chemistry

Synthetic cannabinoids are typically synthetic cannabinoid agonists that function similarly to D9-tetrahydrocannabinol (THC), the principal psychoactive component in cannabis. Like THC, synthetic cannabinoids have structural features that allow binding to one of the known cannabinoid receptors, that is, CB1 or CB2, in the brain and other organs to produce cannabis-like pharmacological activity. Currently, there are many compounds with chemically unrelated structures that fall under this definition and could be classified as follows:*

i) Classical cannabinoids (for example, HU-210, AM-906, AM-411, O-1184)

ii) Nonclassical cannabinoids (for example, CP-47,497-C8, CP-55,940, CP-55,244)

iii) Hybrid cannabinoids (for example, AM-4030)

iv) Aminoalkylindoles (for example, JWH-018, JWH-073, JWH-398, JWH-015, JWH-122, JWH-210, JWH-081, WIN-55,212, JWH-250, JWH-251, pravadoline, AM-694, RSC-4)

v) Eicosanoids (for example, anandamide, methanandamide)

vi) Others (for example, Rimonabant®, JWH 307, CRA-13)

Synthesis and precursors

A number of methods for synthesizing synthetic cannabinoids have been described in detail in the scientific literature.** Precursor chemicals can also be obtained from commercial chemical suppliers. In general, syntheses of classical, nonclassical or hybrid cannabinoids are much more elaborate and complicated due to the presence of asymmetric centres in these compounds. As a result, stereoselective synthesis or elaborate separation of stereoisomers are often necessary to isolate the desired compound. As for compounds without asymmetric centres like most aminoalkylindoles, a vast variety of similar compounds could be easily synthesized by the addition of a halogen, alkyl, alkoxy or other substituents to one of the aromatic ring systems, or other small changes could be made, such as variation of the length and configuration of the alkyl chain.

Most of the aminoalkylindoles can be easily synthesized with standard laboratory equipment and readily available reagents. The synthesis of nonclassical cannabinoids requires more elaborate equipment and technical know-how, but it should be feasible for a chemist with a sound basic training in organic synthesis.

Medicinal use

Some synthetic cannabinoids are commercially available for medicinal purposes such as Nabilone (Cesamet®) for treatment of cancer patients under chemotherapy and Dronabinol (Marinol®) which is a synthetically produced pure THC applied in multiple sclerosis and palliative care.

Pharmacology and toxicity

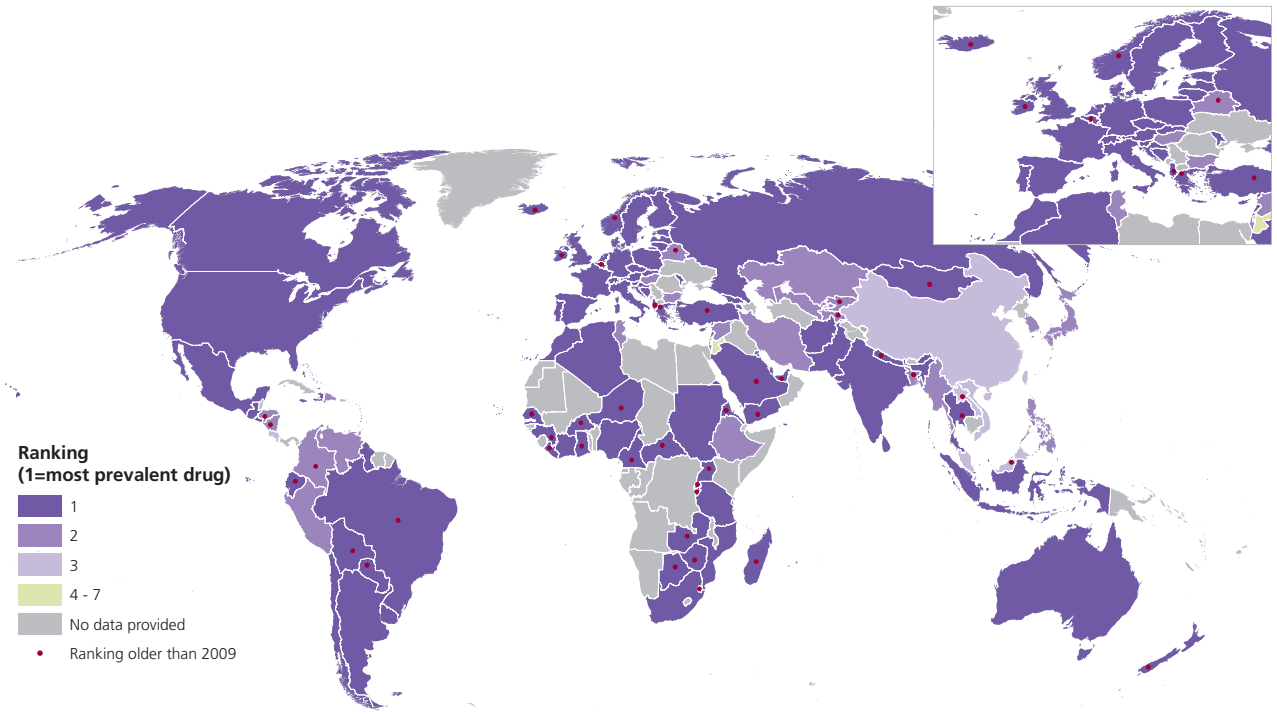
So far, little is known about the pharmacology and toxicology of these compounds. Some case reports have shown that health-related problems associated with the use of these herbal products seem to be very similar to problems reported after cannabis use.*** Cardiovascular problems and psychological disorders such as panic attacks were among the frequently reported symptoms. A number of these substances may have a higher addictive potential compared to cannabis due to quicker development of tolerance. Some synthetic cannabinoids, for example, HU-210, CP-55,940 and WIN-55,212-2, which act as full agonists at the CB1 receptor, could possibly cause severe or even life-threatening intoxications when overdosed. Furthermore, due to its structural features in certain aminoalkylindoles, some carcinogenic potential could also be possible.

* Howlett et al., 'International Union of Pharmacology. XXVII. Classification of cannabinoid receptors,' *Pharmacol Rev*, 2002. 54(2): p. 161–202.

** Huffman et al., 'Structure-activity relationships for 1-alkyl-3-(1-naphthoyl)indoles at the cannabinoid CB1 and CB2 receptors: steric and electronic effects of naphthoyl substituents. New highly selective CB2 receptor agonists,' *Bioorganic and Medicinal Chemistry*, 2005, 13(1): pp. 89–112.

*** Vardakou et al., 'Spice drugs as a new trend: mode of action, identification and legislation,' *Toxicology Letters*, 2010. 197(3): pp. 157–62.

Map 42: Ranking of cannabis in order of prevalence, 2009 (or latest year available back to 2005)



Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.
Dotted line represents approximately the Line of Controlin Jammu and Kashmir agreed upon by India and Pakistan.The final status of Jammu and Kashmir has not yet beenagreed upon by the parties.

5.3 Production

Cannabis is produced in practically every country of the world, making it the most widely produced illicit drug. Cannabis herb is mostly produced for domestic or regional markets, whereas cannabis resin is trafficked over larger distances. The major countries identified as sources by the cannabis resin consumer markets are Afghanistan, Morocco, Lebanon and Nepal/India. Attempts to estimate cannabis production encounter severe deficiencies in the data, which were extensively described in former *World Drug Reports* and is reflected in the reporting. In the 2009 *World Drug Report*, it was estimated that the production of cannabis herb ranged from 13,300-66,100 mt and of cannabis resin from 2,200-9,900 mt. The resulting total area under cannabis cultivation was estimated at 200,000-641,800 ha. The calculations were based on the minimum and maximum levels from reported cultivation and production, seizures and user prevalence rates. In 2010, these indicators did not show significant changes that would justify an update of the production estimates, taking into account the large minimum and maximum levels. Therefore, the production estimates were not updated for this *World Drug Report*. This chapter focuses on some production trends found in the last year, with a focus on trends in potency.

Table 39: Update of available information on the extent of cannabis cultivation and production in major producing countries, 2009*

Source: UNODC ARQ 2009 unless otherwise specified.

Country	Cultivated area (ha)	Eradication		Harvestable area (ha)	Production (mt)	
		Area (ha)	Plants		Resin	Herb
Afghanistan[20]	9,000-29,000 (2010)			9,000-29,000 (2010)		
Belarus	300			300		
Bolivia[21]			1,910,857 (kg)		1,200-3,700 (2010)	
Guatemala			429,610 (kg)			
India	4,265	4,265		0		
Lebanon	1,310	1,310		0		
Mexico		16,547		17,500[22]		
Morocco				47,500[23]		
Nigeria		925				
Philippines			477,927 (kg)			
South Africa	880	567		313		657[24]
Spain						29
Sri Lanka	500					
Swaziland		542				
USA[25]			9,980,038 outdoor plants/ 414,604 indoor plants			

* Or other year, if mentioned.

20 UNODC, Afghanistan cannabis survey 2010 (preliminary).

21 OAS, Mecanismo de *Evaluación Multilateral, Evaluación del progreso de control de drogas 2007-2009*.

22 US Department of State, *International Narcotics Control Strategy Report, 2011*.

23 Note Verbale to UNODC, 27 December 2010.

24 Calculated from the harvestable area, number of harvests and yield figures in UNODC, ARQ 2009.

25 US Department of Justice, Drug Enforcement Administration, 2009.

Cannabis cultivation in some major producing countries

In 2010, UNODC and the Government jointly carried out a survey in an important cannabis resin producing country, Afghanistan. The results of the first cannabis survey in 2009 indicated that Afghanistan is among the major cannabis resin producing countries and that cannabis has become a competitor to opium poppy as a lucrative crop for farmers in the country. The preliminary 2010 survey gave no indications for major changes in the levels of cultivation and production compared to 2009. It showed a cultivation range of 9,000 to 29,000 hectares, compared to 10,000-24,000 hectares in 2009. Resin production ranged between 1,200 and 3,700 mt, compared to 1,500 to 3,500 mt in 2009.

The importance of Afghanistan as a cannabis resin producer is reflected in the seizures reported by other countries. 10% of all countries reporting cannabis seizures mentioned Afghanistan as the source of cannabis. The Government of Morocco reported a reduction of cultivation area to 47,500 ha,[26] however, Morocco continued to be mentioned as source by the majority of countries reporting cannabis resin seizures to UNODC (19%). This suggests that Morocco continued to be a major producer of cannabis resin. Data on seizures and prices in Europe suggest that the supply of cannabis resin from Morocco to the region has remained the same or slightly decreased.

Other countries were increasingly reported as sources of cannabis, including Lebanon, Spain (as a transit country for Moroccan cannabis), Turkey and India. India also reported substantial cannabis cultivation and subsequent eradication of 4,265 ha.

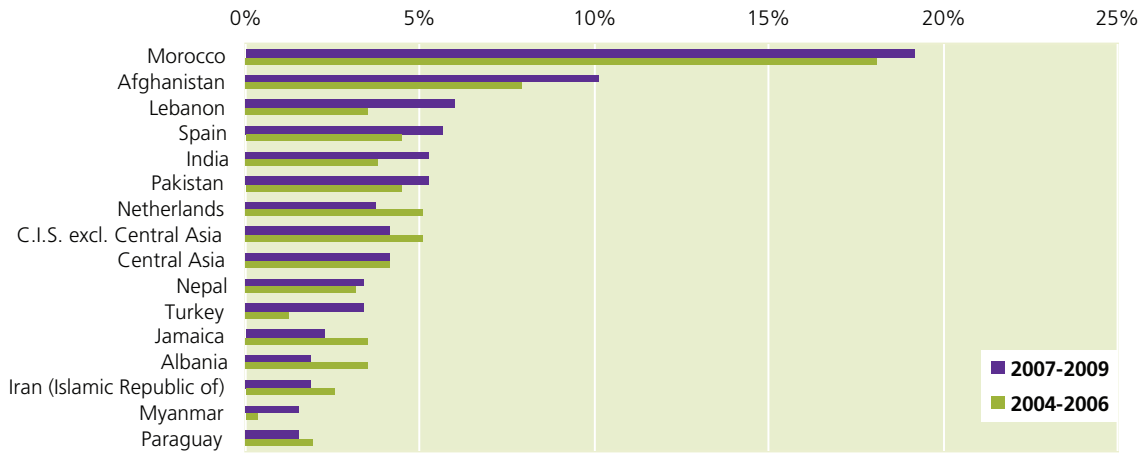
The amount of cannabis herb produced in the United States is unknown but believed to be high and rising. The rise is illustrated by the continuing increase of eradicated cannabis plants, mainly grown on public lands by foreign criminal groups (attributed to Caucasian, Asian, Cuban and Mexican criminal groups/drug trafficking organizations.[27]) The indoor production is believed to be increasing as well; however, the number of eradicated indoor-grown plants is stable.[28]

Although the Mexican Government does not estimate its national production level,[29] reports from the United States suggest that cannabis cultivation in Mexico has increased. The US estimates suggest that cultivation in Mexico has increased from 5,600 ha in 2005 to 17,500 ha in 2009. According to the US sources, the increase may be a result of a shifting law enforcement focus from reduction of illicit crop cultivation to public security tasks.[30]

Cannabis production in Europe is believed to be increasing,[31] mostly in indoor settings and increasingly controlled by organized crime groups. Herbal cannabis is now commonly produced inside Europe (29 European countries reported domestic cultivation in 2008), closer to its intended market and therefore less likely to be intercepted.[32]

Fig. 154: Main source* countries of cannabis resin reported to UNODC in the periods 2007-2009 and 2004-2006**

* Source countries might not always mean the country where it was produced and might also indicate the latest known transit country.
** Number of times that countries were identified as source countries, represented as proportion of countries reporting.
Source: UNODC ARQ.



26 The last joint survey by UNODC and the Moroccan Government was carried out in 2005.

27 US Department of Justice, *National Drug Threat Assessment 2010.*

28 US Department of Justice, Drug Enforcement Administration, 2009.

29 Currently, the Mexican Government is preparing to conduct its own cannabis production surveys in cooperation with UNODC.

30 US Department of State, *International Narcotics Control Strategy Report*, 2011.

31 EMCDDA, *Annual Report 2010.*

32 Ibid.

Fig. 155: Eradicated cannabis plants at indoor and outdoor cultivation sites in the United States, 2003-2009

Source: US Department of Justice, Drug Enforcement Administration, 2009.

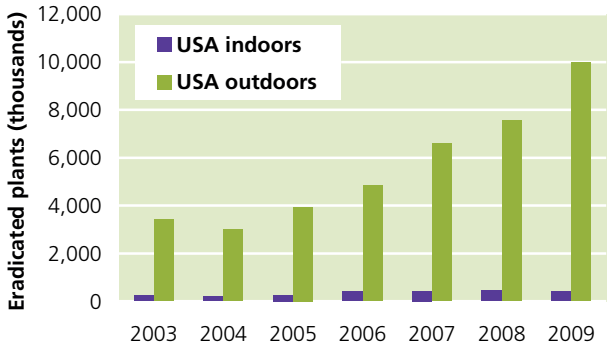
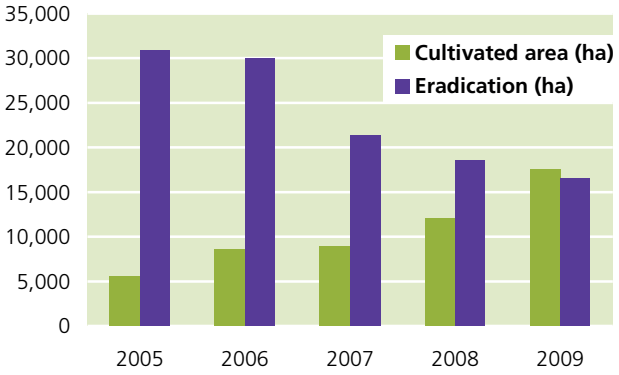
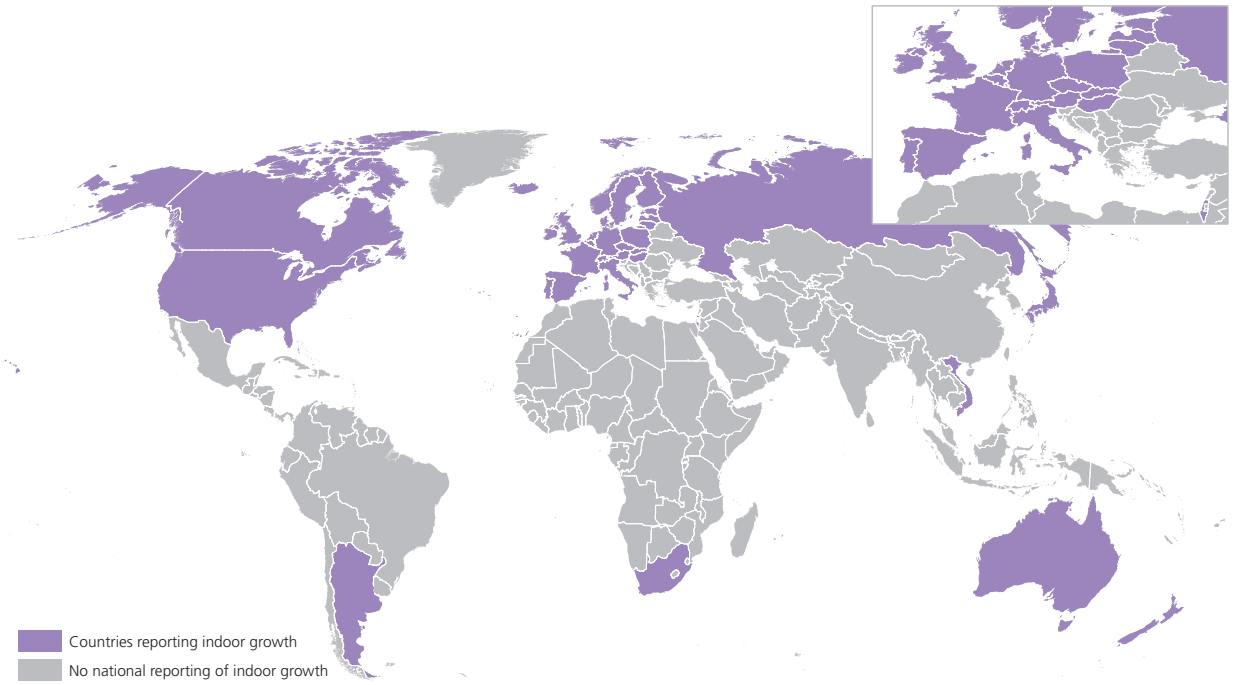


Fig. 156: Cultivation and eradication figures for Mexico, 2005-2009

Sources: UNODC ARQ; US International Narcotics Control Strategy Reports.



Map 43: Evidence of indoor cannabis cultivation in the world



Sources: UNODC, ARQ 2008-2009; National reports to the INCB 2007-2010; INCSR 2010-2011; Thirty-third Meeting of Heads of National Drug Law Enforcement Agencies, Asia and the Pacific, (Denpasar, Indonesia, 6-9 October 2009); Kilmer and Hoorens, Understanding illicit drug markets, supply- reduction efforts, and drug-related crime in the European Union, RAND Europe, 2010; REITOX reports, National Reports to the EMCDDA, 2009-2010; OAS, Multilateral Evaluation Mechanism, 2008; Netherlands Police Agency (KLPD-IPOL).
Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

Changes in THC concentrations

In the recent past there were claims of strong increases in THC concentrations (frequently referred to as 'potency') of cannabis, the main active component of cannabis. Cannabis THC contents have changed frequently in different countries. The most systematic and standardized collections of THC content are performed in the United States, the Netherlands and Germany[33] and are presented below.

THC concentration in herbal cannabis in the United States, the Netherlands and Germany

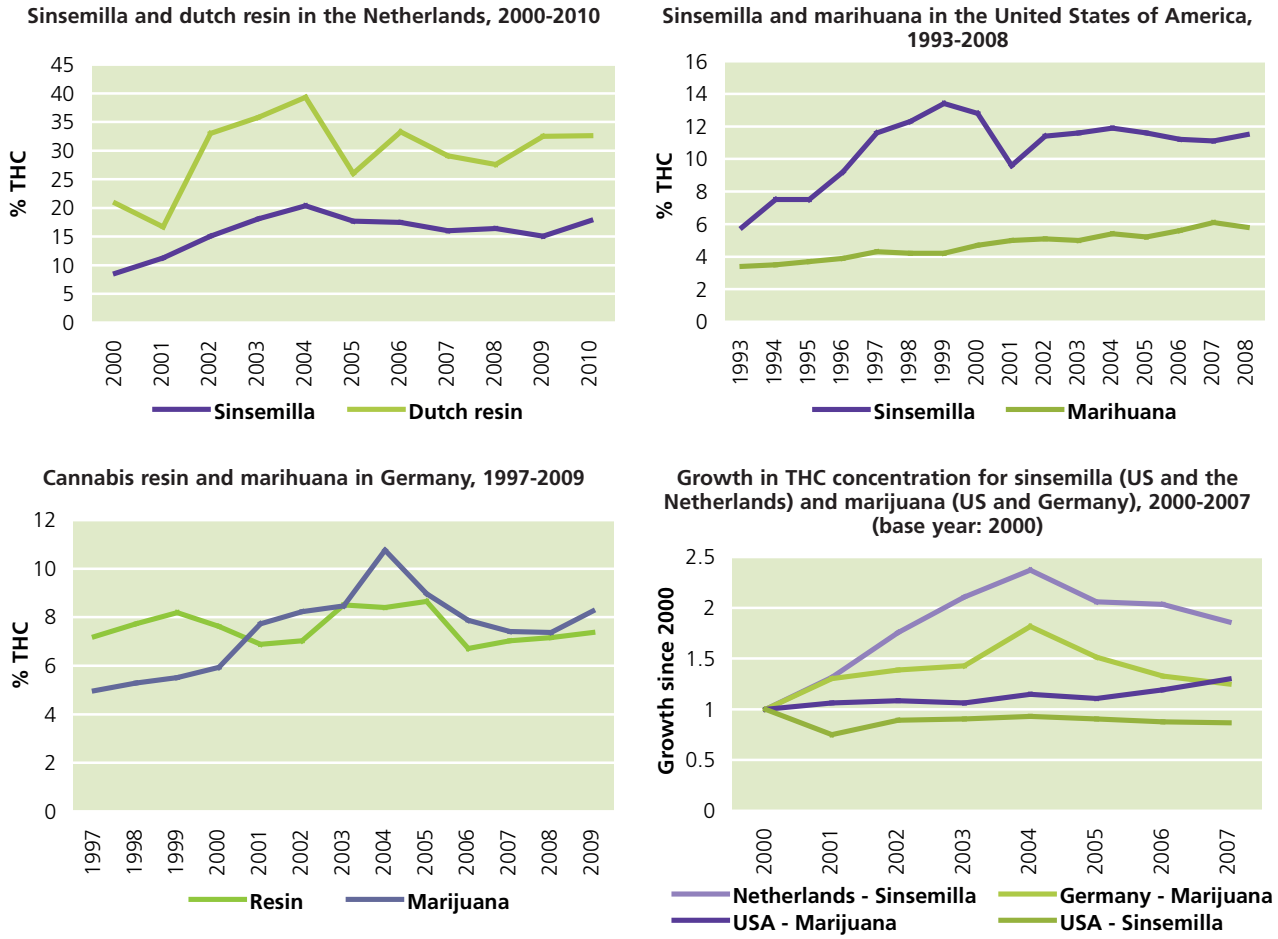
At the end of the 1990s/beginning of the 2000s, both the US and the Netherlands experienced an increase of the average THC contents in their herbal cannabis products. In the US, the average THC concentration of sinsemilla doubled from 6% to 13% from the early 1990s to the late 1990s, after which the level decreased and became practically stable around 11% over the past decade.[34] At the same time, THC contents of the more

33 Measured from samples: in the USA, from 46,211 samples confiscated by law enforcement agencies; in the Netherlands, from yearly collected samples from 50 randomly selected coffeeshops; in Germany, calculated from seizure data, in 2009 from 9,250 samples.

34 These are average values and the ranges of potency have not changed. High potency cannabis was also available in the past, however, it was less common.

Fig. 157: THC concentrations for different cannabis products in the Netherlands, United States and Germany, with varying time series

Sources: THC-concentraties in wiet, nederwiet en hasj in Nederlandse coffeeshops 2009-2010; THC-concentraties in wiet, nederwiet en hasj in Nederlandse coffeeshops 2005-2006.; Mehmedic, Z. et al, 'Potency Trends of Δ9-THC and Other Cannabinoids in Confiscated Cannabis Preparations from 1993 to 2008,' Journal of Forensic Sciences, September 2010, Vol. 55, No.5, pp. 1209-1217; 2010 national report (2009 data) to the EMCDDA by the Reitox National Focal Point for Germany.



commonly grown marijuana are significantly lower since the consumed marijuana in the USA is mainly produced outdoors; THC contents in marijuana show a consistent but slowly increasing trend in the 15-year period.

In the Netherlands, yearly analyses have been performed since 2000, and the results show a sharp increase in THC concentration of sinsemilla in the early 2000s, from nearly 9% to 19%. This is attributed to the increasingly common use of improved breeds, indoor cultivation and the use of sophisticated techniques. Although these techniques were already available in the 1980s, the profile of the cultivators has changed to organized professionals. Nevertheless, since 2004, the general trend was downwards to 15% in 2009. In Germany, the THC concentration of marijuana, which is a broader group than sinsemilla alone, shows a similar trend, doubling its THC content from 5% in 1997 to more than 10% in 2004, dropping back again to around 8% in 2009. The similar patterns probably reflect similar production sources. Reports from other countries are fragmented and less systematic; the European countries that reported sufficient data for herbal cannabis reported divergent trends for the period 2003-2008. Six countries reported an increase, four a decrease.[35]

THC concentration in cannabis resin

In the Netherlands, THC contents of cannabis resin show a growth trend similar to that of sinsemilla. The level in the Netherlands increased from 20% to almost 40% in the early 2000s, after which it dropped to around 30% during 2005-2010. In Germany, the THC contents have been fluctuating around 8%, without showing a long-term change. The THC contents of cannabis resin in other European countries followed divergent patterns, with some countries showing an increase and others a decrease.

35 EMCDDA, *Annual Report 2010.*

5.4 Trafficking

Among the four major drug groups, cannabis derivatives constitute the most widely trafficked and most easily available class of illicit drugs. Reports of cannabis seizures refer mainly to cannabis herb and cannabis resin, but also cannabis plant, cannabis oil and cannabis seed. Large quantities of cannabis herb are seized worldwide, while seizures of cannabis resin are concentrated mainly in Europe, North Africa and the Near and Middle East/South-West Asia, reflecting the locations of production and main consumer markets for cannabis resin. The fact that production of cannabis resin occurs to a large extent in countries removed from the main consumer markets brings about the necessity for trafficking of cannabis resin across different regions, in contrast with the more localized trafficking patterns of cannabis herb.

Cannabis herb

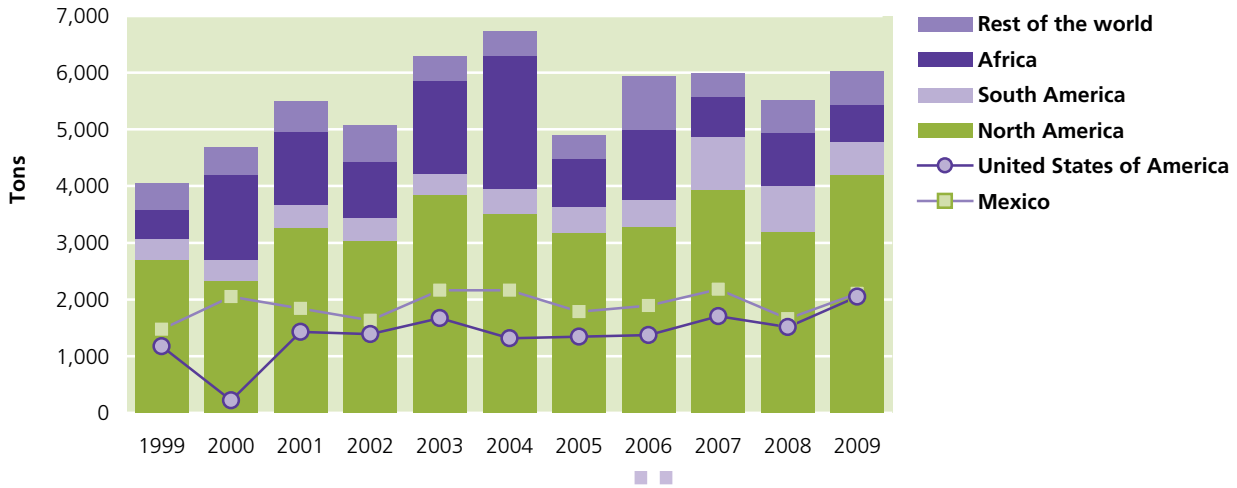
Following a slight drop (8%) in 2008, in 2009, global cannabis herb seizures returned to the levels of 2006 and 2007, amounting to 6,022 mt. North America accounted for 70% of global seizures, followed by Africa (11%), South America (10%), Asia (6%) and Europe (3%).

Given the relative ease of cannabis cultivation, the supply of cannabis herb can often be locally sourced, with the result that the trafficking patterns tend to be rather localized in comparison with cannabis resin or other drugs. In the ARQ replies for 2009, out of 68 countries that provided information about the country of origin of cannabis herb trafficked in their territories, 44 countries assessed that some or all cannabis herb originated in their own country. For these countries, on average 75% of all herb originated from their own country.[36]

Cannabis herb retail prices displayed significant inter-regional as well as intra-regional variation, even when adjusted for purchasing power parity. Retail prices appear to be driven both by the availability of cannabis herb, which is in turn linked to domestic production levels, as well as the disposable income of consumers. Overall, prices were significantly lower in Africa and in Central and South America and the Caribbean. Some of the lowest prices were registered in Togo, India, Guatemala and the United Republic of Tanzania, while the highest price was registered in Japan. The low prices in some of these countries could be partly due to high production, but income levels likely also play a significant role. Similarly, the price in Japan may be high partly because of the high income level of consumers and partly because, contrary to the common pattern in other countries, a significant share of cannabis herb in Japan appears to be imported.

Fig. 158: Cannabis herb seizures worldwide, 1999-2009

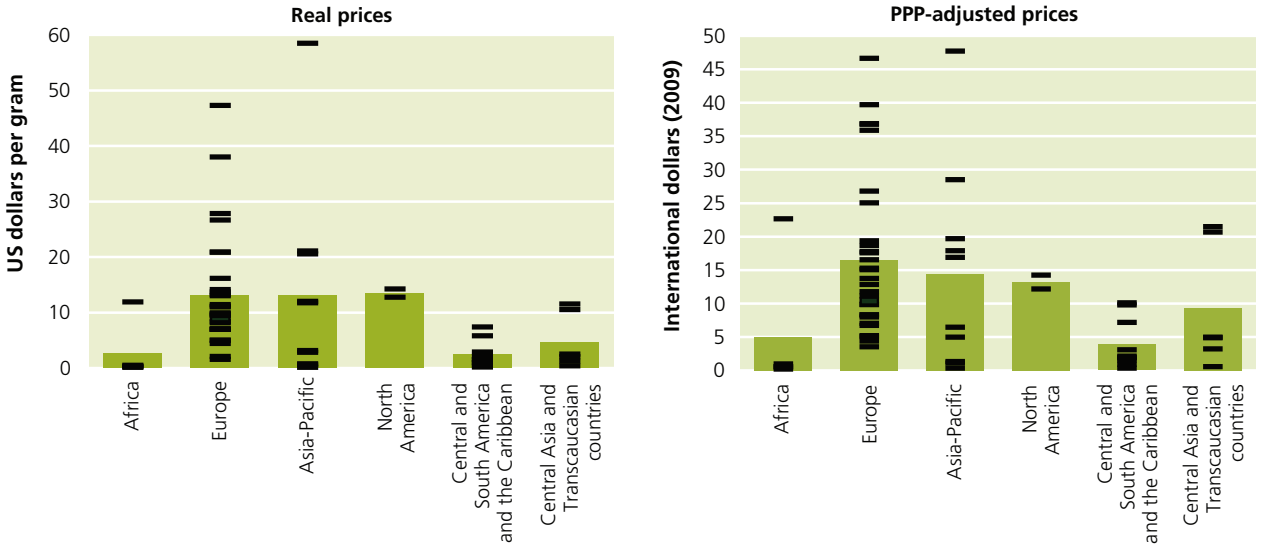
Source: UNODC DELTA.



36 Calculated based on the 33 countries that gave a percentage. The other 11 countries pointed to their own country without specifying the proportion.

Fig. 159: Cannabis herb retail prices worldwide, by region, 2009

Source: UNODC DELTA.



Americas

Cannabis herb seizures in North America rose from 3,205 mt in 2008 to 4,189 mt in 2009, driven by increases in both Mexico and the United States, which continued to report the largest cannabis herb seizures worldwide. Large quantities of cannabis herb are produced in Mexico and trafficked to the United States. Seizures in the United States rose to a record level of 2,049 mt in 2009, up by one third on the previous year, and a similar increase was registered in Mexico, with seizures rising from 1,658 mt in 2008 to 2,105 mt in 2009.

Seizures in Mexico were made mainly close to the areas of cultivation or close to the border with the United States. In 2009, the contiguous states of Sinaloa, Durango, Chihuahua and Sonora accounted for 75% of cannabis herb seizures, while Sinaloa, Chihuahua and Durango accounted for 76% of eradication, with the states of Nayarit, Jalisco, Michoacán, Guerrero and Oaxaca on the Pacific coast accounting for an additional 20% of eradication.

The supply of cannabis herb in the consumer market in the United States is partly locally produced and partly trafficked into the country from Mexico as well as, to a smaller extent, from Canada. In 2008, border seizures of cannabis herb made by US authorities amounted to 1,253 mt on the US-Mexico border and 3 mt on the US-Canada border; based on partial data for 2009, seizures on both borders rose in 2009, but they remained concentrated on the US-Mexico border. According to US authorities, cannabis herb in Mexico was widely available, in part due to rising production there.[37]

The United States also reported that foreign drug trafficking organizations were increasingly engaging in indoor and outdoor cannabis cultivation, and their distribution networks were growing. Canada reported that Asian organized crime groups continued to specialize in cannabis cultivation while Indo-Canadian and East European organized crime groups were involved in cross-border smuggling.

Large quantities of cannabis herb, as well as cannabis plants, continued to be seized in South America. Seizures in this region peaked at 946 mt in 2007 and since then fell twice in succession, standing at 598 mt in 2009. The largest seizures were registered in Colombia, where seizures declined from 255 mt in 2008 to 209 mt, and in Brazil, where seizures also fell, from 187 mt in 2008 to 131 mt. In relative terms, a significant increase was registered in the Bolivarian Republic of Venezuela, where seizures rose by 58% in 2009, reaching 33 mt – the highest level since 1990.

Considering seizures of the various forms of cannabis collectively (cannabis herb, plant, resin, oil and seed), the Plurinational State of Bolivia recorded a consistent increase over the period 1998-2009. The reported quantities, which include predominantly cannabis plant, amounted to 320 kg in 1998, 28 mt in 2004 and 1,937 mt in 2009. According to preliminary data, seizures receded to 1,073 mt in 2010.

The recent high levels of cannabis plant seizures in the Plurinational State of Bolivia are comparable with cannabis plant seizures registered in Paraguay in 2007 and 2008 – 4,667 mt in 2007 and 5,185 mt in 2008. Seizures of very large numbers of cannabis plants have also been reported by Guatemala: 10.8 million in 2008 and 4.3 million in 2009.

37 US Department of Justice, *National Drug Threat Assessment 2010.*

Fig. 160: Growth of aggregate cannabis* seizures in selected South American countries, 1997-2009 (baseline: 1997)

*Cannabis herb, plant, resin, oil and seed. For the purposes of aggregation, one cannabis plant is assumed to have a weight of 100 grams.

Source: UNODC DELTA.

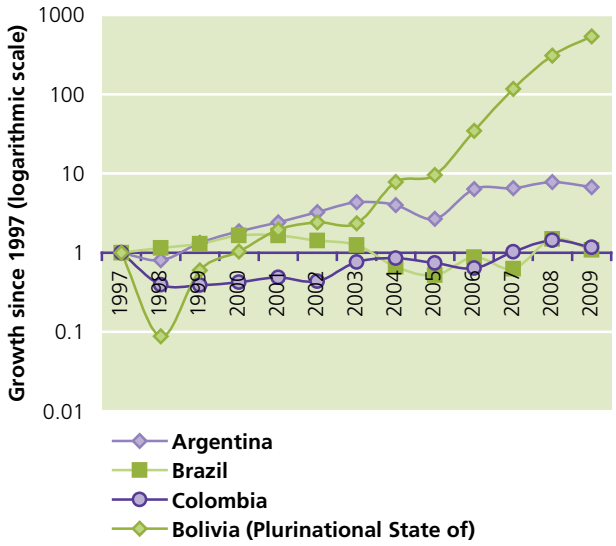


Fig. 161: Africa: seizures of cannabis herb by subregion, 1999-2009

Source: UNODC DELTA.

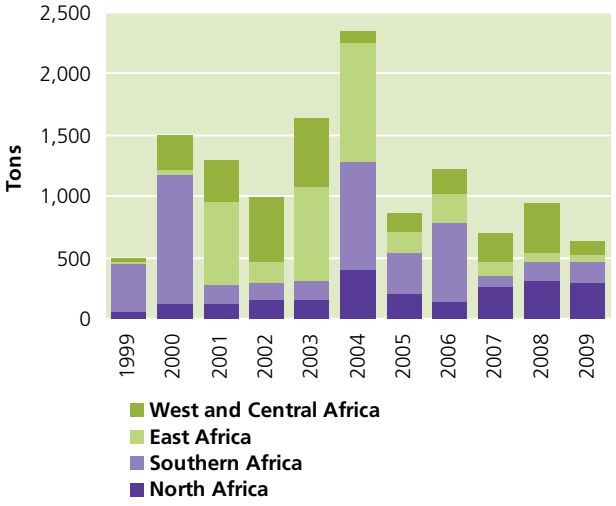
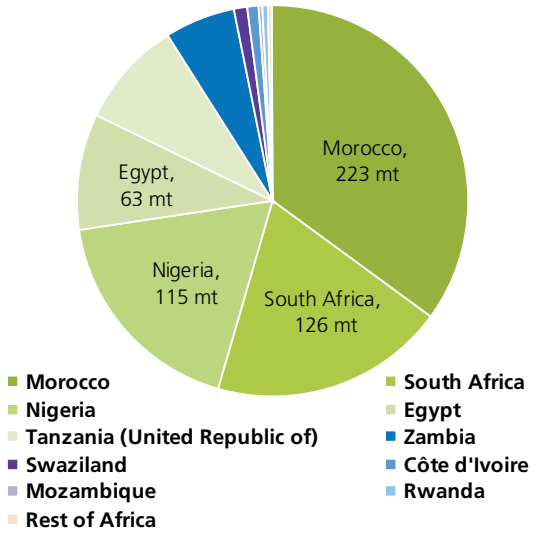


Fig. 162: Africa: cannabis herb seizures, by country, 2009

Source: UNODC DELTA.



Africa

Seizures of cannabis herb in Africa have fluctuated considerably in recent years, but have followed a generally decreasing trend since the peak level of 2004. In 2009, total seizures in Africa fell to 640 mt, from 936 mt in 2008. The decline was partly due to a significant drop in Nigeria.

Although cannabis herb continues to be trafficked throughout Africa, seizures tend to be concentrated in a small number of countries. Over the period 2000-2009, UNODC collated records of cannabis herb seizures from 48 countries in Africa. However, seizures in seven of these countries (Egypt, Kenya, Malawi, Morocco, Nigeria, South Africa and the United Republic of Tanzania) accounted for 90% or more of the annual total for Africa each year from 2000 to 2009 and for 94% of the quantity seized in Africa over the entire period.

In 2007 and 2008, the largest annual seizures of cannabis herb in Africa were reported by Nigeria. However, in 2009 seizures in this country fell by almost two thirds, to 115 mt, from 336 mt in 2008. Nigeria assessed that, in 2009, cannabis herb on its territory originated entirely in Nigeria itself, but was destined for the Netherlands (50%), Japan (30%) and Italy (20%). Nigeria also reported a notable increase in the farm-gate price of cannabis – from 8,000 Naira per kg in 2008 to 35,000 Naira per kg in 2009. Both the decline in seizures and the increase in price were attributed to the destruction of cannabis farms by law enforcement operatives in Nigeria.

Morocco continued to seize large quantities of 'kif,' selected parts of herbal cannabis which can be further processed into cannabis resin.[38] However, Morocco has also been mentioned by other countries as a country of origin for cannabis herb, sometimes in addition to cannabis resin. Seizures of 'kif' amounted to 223 mt in 2009 to 187 mt in 2010. In 2009, seizures of cannabis herb declined in Egypt, from 81 mt in 2008 to 63 mt, and in the United Republic of Tanzania, from 70 mt in 2008 to 56 mt.

38 Stambouli, H., El Bouri, A., Bellimam, M. A., Bouayoun, T. and El Karn, N., 'Cultivation of Cannabis sativa L. in northern Morocco,' *Bulletin on Narcotics*, Volume LVII, Nos. 1 and 2, 2005.

South Africa continued to be a source, consumer and transit country for cannabis herb. It appears that the ports of South Africa provide a gateway for cannabis herb produced in neighbouring countries, as well as South Africa itself, and exported to consumer markets outside Africa. This reflects the role of this country as a major trans-shipment hub for legitimate trade. South Africa assessed that, in 2009, 80% of cannabis herb on its territory originated in neighbouring countries (Lesotho and Swaziland). Moreover, an estimated 30% were destined for the consumer markets of Europe. Seizures in South Africa amounted to 126 mt in 2009. In the ARQ replies for 2007-2009, South Africa was mentioned eight times by other countries as a country of origin for cannabis herb. Contrary to the prevalent trend of localized trafficking patterns for cannabis herb, seven of these mentions were by countries outside Africa.

Asia-Pacific

In 2009, the Asia-Pacific region accounted for 5.5% of global cannabis herb seizures. Seizures in this region rose for the second year in a row, standing at 333 mt in 2009. The increases were mainly due to the amounts seized in India and Indonesia, which reported the largest seizures in this region by far.

In 2008, seizures in Indonesia reached a record level of 141 mt. In 2009, seizures fell to 111 mt, but remained high in comparison with historical levels, which averaged 20 mt over the 2003-2007 period. Indonesia assessed that 99% of cannabis herb on its territory originated in Indonesia itself. The increased levels were attributed to improvements in law enforcement efforts, and the decline in 2009 to the success of alternative development programmes.

In 2009, cannabis herb seizures in India rose by almost two thirds, from 103 mt in 2008 to 171 mt – the highest level since 1994. India assessed that 81% of the cannabis seized on its territory in 2009 originated in India itself, with the remainder originating in Nepal. An unspecified proportion was intended for Bangladesh. In 2008, seizures of cannabis herb in Nepal rose to 9.6 mt (the highest level since 1987), and increased by a further 73% in 2009, reaching 17 mt.[39]

According to Thai authorities,[40] cultivation of cannabis herb in Thailand had been drastically reduced over a period of 20 years, and recent trafficking patterns for cannabis herb involved smuggling into Thailand from

Fig. 163: Cannabis herb seizures in the Asia-Pacific region, 1999-2009

Source: UNODC DELTA.

the Lao People's Democratic Republic and out of Thailand into Malaysia. Cannabis herb seizures in Thailand amounted to 19 mt in 2008 and 18 mt in 2009. Significant quantities were also seized in 2009 in Malaysia (2.4 mt, up from 875 kg in 2008[41]) and the Philippines (1.9 mt, down from 3.7 mt in 2008).

In Japan, seizures declined from 504 kg in 2007 to 207 kg in 2009. Japan attributed the decline to a decrease in cases of illegal importation accompanied by an increase in domestic illicit cultivation of cannabis. According to Japanese authorities, one case of large-scale indoor cultivation of cannabis was discovered in Japan and involved six Vietnamese and one Japanese national.[42] Moreover, the number of arrests for cannabis cultivation rose from 207 in 2008 to 243 in 2009, while the number of arrests for smuggling of cannabis fell from 85 in 2008 to 48 in 2009.[43] Nevertheless, in 2009 cannabis herb also continued to be smuggled into Japan from other countries, such as Botswana, France, South Africa and the United States.[44]

Seizures of cannabis herb in Oceania have declined significantly since the peak level of 2001, mainly due to Australian seizures. In 2009 seizures in New Zealand amounted to 759 kg, while in Australia seizures amounted

39 Fifteenth Asia-Pacific Operational Drug Enforcement Conference, February 2010, Tokyo, Japan, country report by Nepal.

40 Fifteenth Asia-Pacific Operational Drug Enforcement Conference, February 2010, Tokyo, Japan, country report by Thailand and Office of the Narcotics Control Board of Thailand, presentation at the Twentieth Anti-Drug Liaison Officials' Meeting for International Cooperation (ADLOMICO), October 2010, Seoul, Republic of Korea.

41 Data collated by DAINAP.

42 International Intelligence Division, Narcotics Control Department, Japan. Presentation at the Twentieth Anti-Drug Liaison Officials' Meeting for International Cooperation (ADLOMICO), October 2010, Seoul, Republic of Korea.

43 Drugs and Firearms Division, National Police Agency, Japan. Presentation at the Twentieth Anti-Drug Liaison Officials' Meeting for International Cooperation (ADLOMICO), October 2010, Seoul, Republic of Korea.

44 Twentieth Anti-Drug Liaison Officials' Meeting for International Cooperation (ADLOMICO), October 2010, Seoul, Republic of Korea, country report by Japan.

to 629 kg[45] in 2009 and 745 kg in 2008, significantly less than previous levels in this country, which averaged 6.1 mt over the 2001-2003 period. Despite the high prevalence rate of cannabis use in Australia, the seized quantities are relatively low, even when compared on a per capita basis with similar consumer markets such as Europe and the United States.

Rest of the world

In Central Asia, the largest quantities of cannabis herb continued to be seized by Kazakhstan (26 mt in 2009) where cannabis was partially supplying the domestic market and partially intended for other markets such as the Russian Federation where significant seizures were also registered (33 mt, up from 25 mt in 2008). Seizures in West and Central Europe amounted to 101 mt, essentially sustaining the increased level of 2008.

In recent years, seizures of cannabis herb in Turkey have followed a notable increasing trend, rising six-fold over a period of 5 years, from 6.8 mt in 2004 to a record level of 42 mt in 2009. According to Turkish authorities,[46] the increase in cannabis trafficking was attributable to illicit cultivation taking place in some rural parts of the country.

Cannabis resin

Global cannabis resin seizures reached a record of 1,648 mt in 2008, and in 2009 declined to 1,261 mt - a level comparable to those registered in previous years. Every year from 2001 onwards, West and Central Europe, the Near and Middle East/South-West Asia and North Africa together accounted for 95% or more of global cannabis resin seizures. The proportion attributable to West and Central Europe declined gradually from 73% in 2004 to 48% in 2009. The year 2009 marked a significant shift in cannabis resin seizures, away from the consumer market of West and Central Europe and toward North Africa, an important source region for cannabis resin reaching Europe.

The high level of 2008 was partly due to increases in the Near and Middle East/South-West Asia; in particular a single extraordinarily large seizure of 236.8 mt[47]of cannabis resin made by Afghan authorities in Kandahar province in June 2008. A less pronounced increase in seizures was registered in West and Central Europe in 2008; however, in 2009 seizures fell in both West and Central Europe and the Near and Middle East/South-West Asia, and the drop was partially offset by seizures in North Africa.

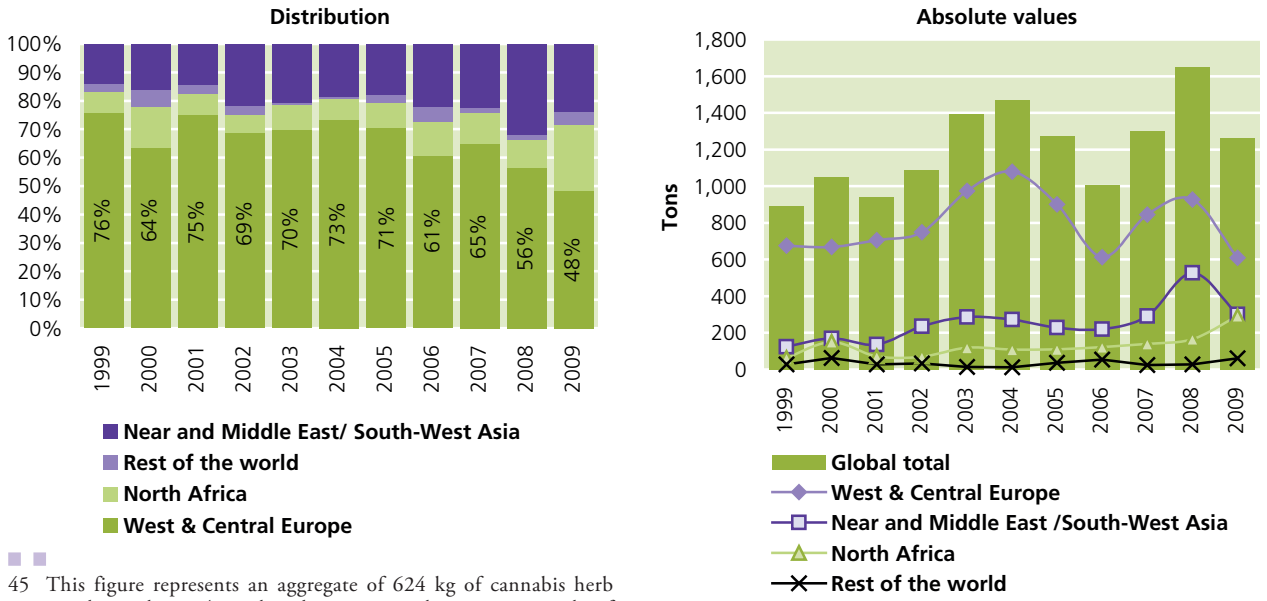
In contrast with cannabis herb, the demand for which tends to be met by production occurring in relative proximity to consumption, large quantities of cannabis resin are trafficked significant distances to reach consumer markets.

Europe and North Africa

Spain continued to report the largest annual seizures of cannabis resin worldwide. Large quantities of cannabis resin are trafficked from the source country of Morocco to Spain, and on to other countries in Europe. In 2009,

Fig. 164: Global cannabis resin seizures, by region, 1999-2009

Source: UNODC DELTA.



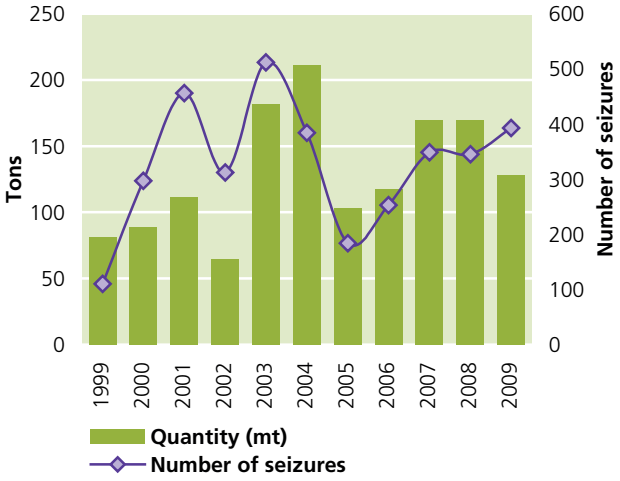
45 This figure represents an aggregate of 624 kg of cannabis herb together with 11,042 seeds or bags, converted assuming a weight of half a gram per unit.

46 Ministry of Interior, Turkish National Police, Department of Anti-Smuggling and Organized Crime, *Turkish Report on Drugs and Organized Crime 2009*.

47 International Security Assistance Force, Press Release 11 June 2008 (http://www.nato.int/isaf/docu/pressreleases/2008/06-june/pr080611-246.html) and UNODC press release, 12 June 2008 (http://www.unodc.org/unodc/en/press/releases/2008-06-12.html).

Fig. 165: Significant individual seizures of cannabis resin in Spain originating in Morocco, 1999-2009

Source: UNODC IDS.



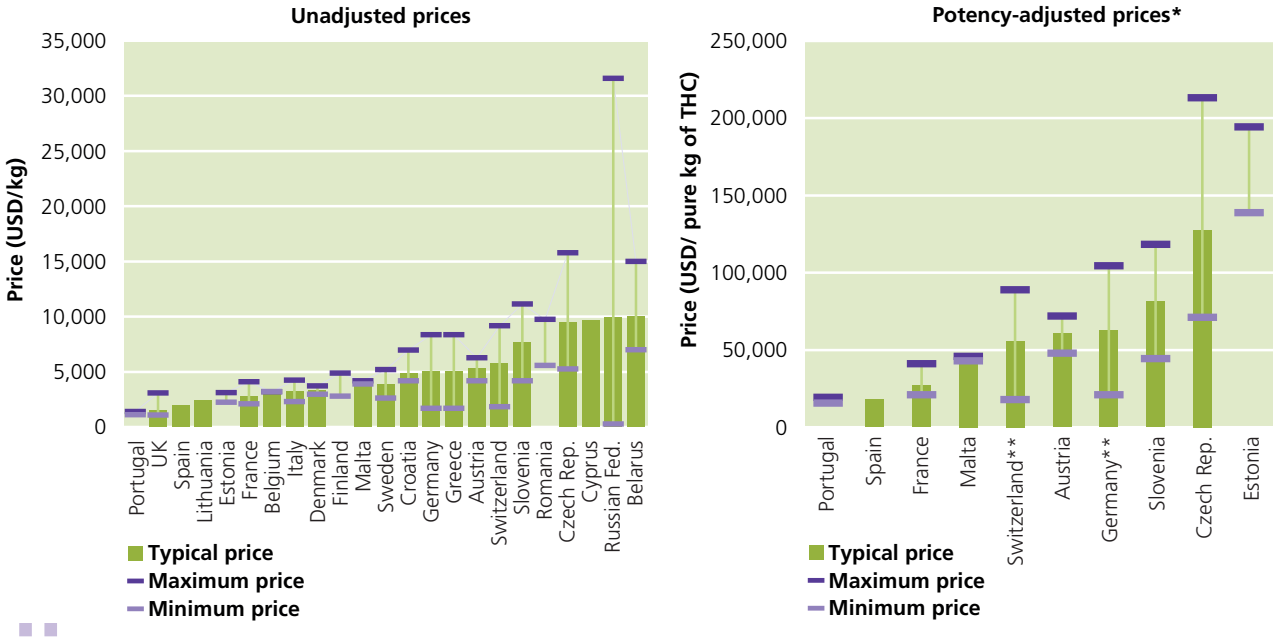
seizures of cannabis resin in Spain fell to 445 mt – the lowest level since 1999 (431 mt) - while seizures in Morocco rose from 114 mt in 2008 to 188 mt in 2009 – the highest level on record. Over the period 1999-2009, approximately one half of significant individual drug seizures reported by Spain involved cannabis resin. Among these seizure cases, Morocco was practically the only country of origin[48] for the seized cannabis resin. However, Morocco is likely not the only source country for cannabis resin reaching Europe, and Spain assessed that the drop in the total quantity of resin seized in Spain was due to the European market drawing from another supplier than Morocco. In 2010, seizures in Morocco fell back to 118 mt.

Increases in cannabis resin seizures were also observed in other North African countries. In Algeria and Egypt, seizures more than doubled in 2008, reaching a record level of 38 mt in Algeria and a level of 12.8 mt – the highest since 1989 - in Egypt. In 2009, seizures in Egypt appeared to stabilize, amounting to 11.4 mt, but seizures in Algeria rose even further, registering the fourth consecutive year-on-year increase. Indeed, seizures in Algeria amounted to 74.6 mt in 2009, compared with 1.7 mt in 2005. Algeria reported that in 2009 cannabis resin and cannabis herb in its territory originated entirely in Morocco.

Seizure data and, to some extent, price data support the flow of cannabis resin from North Africa into western Europe via Spain. Apart from Spain, which reports the largest cannabis seizures in Europe by far, the largest seizures among European countries in 2009 were reported by France and Portugal, followed by Italy and Belgium. The decrease in seizures in Spain in 2009 was reflected in similar decreases in the four European countries which seized the largest quantities in 2008 (apart from Spain): France (-21%), Portugal (-62%), Italy (-43%) and the United Kingdom (-61%). Seizures in Belgium have fluctuated considerably, amounting to 18.7 mt in 2009 (up from 1.5 mt in 2008).

Fig. 166: Wholesale cannabis resin prices in Europe, 2009

Source: UNODC DELTA.

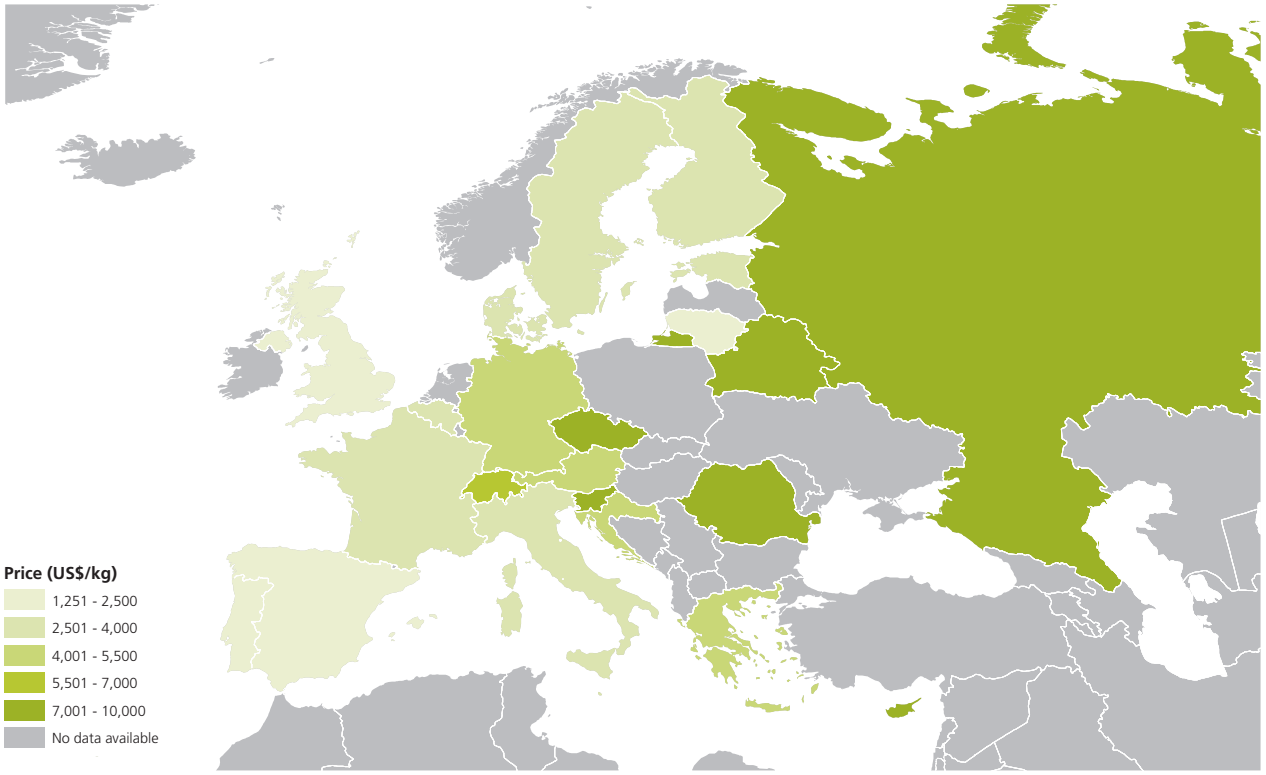


48 This excludes mentions of Spain itself as the country of 'origin,' which likely refer to the point of departure of the consignment rather than the actual country of origin of the drug.

* UNODC estimates based on reported price and typical purity data.
** Purity data for Germany and Switzerland relative to 2008.

Map 44: Wholesale cannabis resin prices* in Europe, 2009

*Not adjusted for THC concentration due to lack of data.



Source: UNODC, ARQ 2009
Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

Wholesale prices of cannabis resin (unadjusted for potency) in Europe are also compatible with a flow of cannabis resin from Spain to the rest of Europe, with some notable exceptions. In 2009, the lowest wholesale prices in Europe were registered by Portugal and Spain, while France, Italy and Belgium reported slightly higher prices. Prices reported by the United Kingdom and the neighbouring countries of Estonia and Lithuania, however, were low. A clearer picture emerges when prices are adjusted for potency, with the price in Estonia being the highest among those countries where both price and potency data were available.[49]

Although large quantities of cannabis resin continue to be trafficked from Morocco to Europe, cannabis resin also reaches Europe from other regions. Afghanistan and India were both frequently mentioned by European countries as countries of origin for cannabis resin in 2009. India assessed that approximately half of the cannabis resin on its territory in 2009 was produced in India itself, and identified western Europe and Canada among the intended destinations.

Asia-Pacific

In 2007 and 2008, Viet Nam accounted for the largest seizures of cannabis resin in the Asia-Pacific region. Seizures in this country amounted to 8 mt in 2007 and 8.8 mt in 2009.[50] According to Vietnamese authorities,[51] in May 2008, more than 8 mt of cannabis resin was seized in a single case in the town of Mong Cai, on the border with China. The circumstances of the case suggest that Viet Nam was serving as a transit country for cannabis resin, and anecdotal reports indicate that the consignment could be traced back to Pakistan, and was intended for Canada.

Significant quantities of cannabis resin continued to be seized in India, although seizures fell from the peak level of 2007 (5.2 mt) to 3.5 mt in 2009. India assessed that, in 2009, half of the cannabis resin present on its territory was trafficked into India from Nepal, with the remainder originating in India itself. The intended destinations included the metropolitan areas and tourist destinations within India, but cannabis resin was also trafficked from India to Europe and Canada.

According to Nepalese authorities,[52] seizures of cannabis resin fell from 2.0 mt in 2008 to 1.6 mt in 2009. Cannabis resin was produced in Nepal and trafficked to

49 Data on potency for 2009 were unavailable for Lithuania and the United Kingdom.

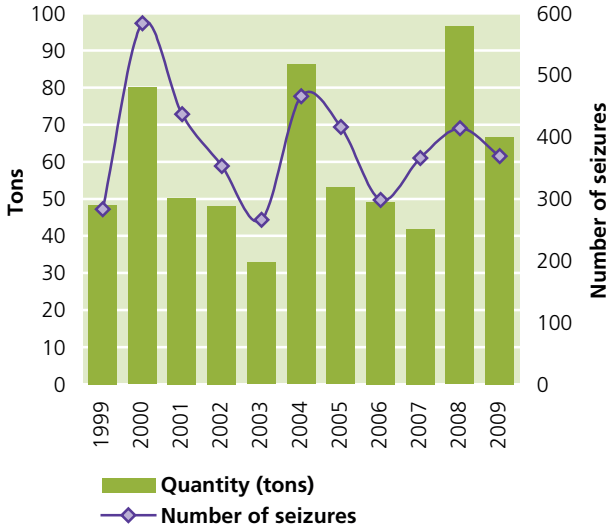
50 Data collated by DAINAP.

51 Seventh ACCORD Task Force III Meeting, Philippines, July 2008. Presentation by Viet Nam.

52 Fifteenth Asia-Pacific Operational Drug Enforcement Conference, February 2010, Tokyo, Japan, country report by Nepal.

Fig. 167: Significant individual seizures of cannabis resin in Pakistan originating in Afghanistan, 1999-2009

Source: UNODC IDS.



China and India overland. Cannabis resin was further distributed from India to other destinations via cargo couriers.

Near and Middle East/South-West Asia

Seizures of cannabis resin in Pakistan rose for two years running, reaching 205 mt in 2009 – the highest level since 1995. Pakistan continued to assess the share of cannabis resin originating in Afghanistan at 98%. Over the period 1999-2009, 41% of significant individual drug seizures reported by Pakistan involved cannabis resin; the country of origin for these consignments was identified almost exclusively as Afghanistan.

In the Islamic Republic of Iran, seizures of cannabis resin fell twice in succession, from the record level of 2007 (90 mt) to 69 mt in 2009. Based on data for the first nine months of the year, it appears that the decreasing trend continued into 2010. The Islamic Republic of Iran assessed that, in 2009, one quarter of cannabis resin trafficked on its territory was intended for the country itself, with the remainder intended for Arab countries, Turkey and Europe.

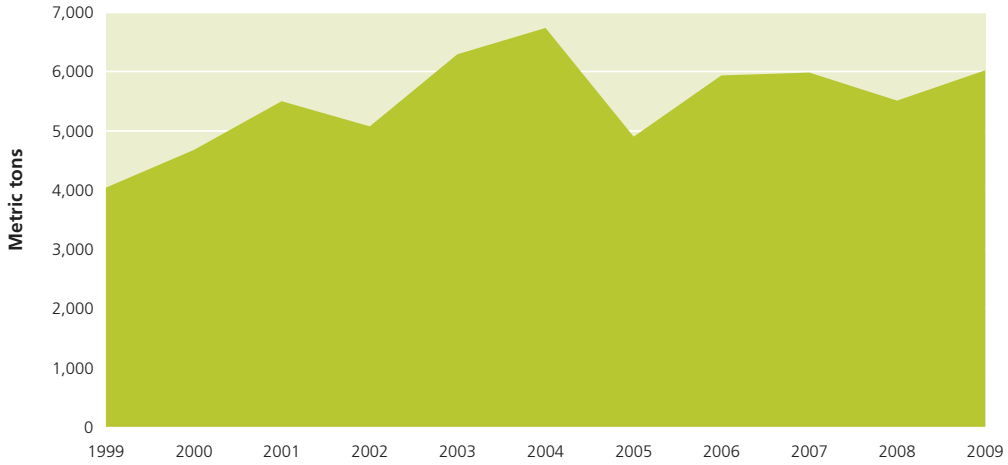
Seizures in Afghanistan fell from the record level of 2008 (271 mt) to the relatively low level of 10.5 mt in 2009, representing slightly less than 1% of the global total for 2009. Seizures in Afghanistan averaged 56 mt over the 2002-2007 period.

North America

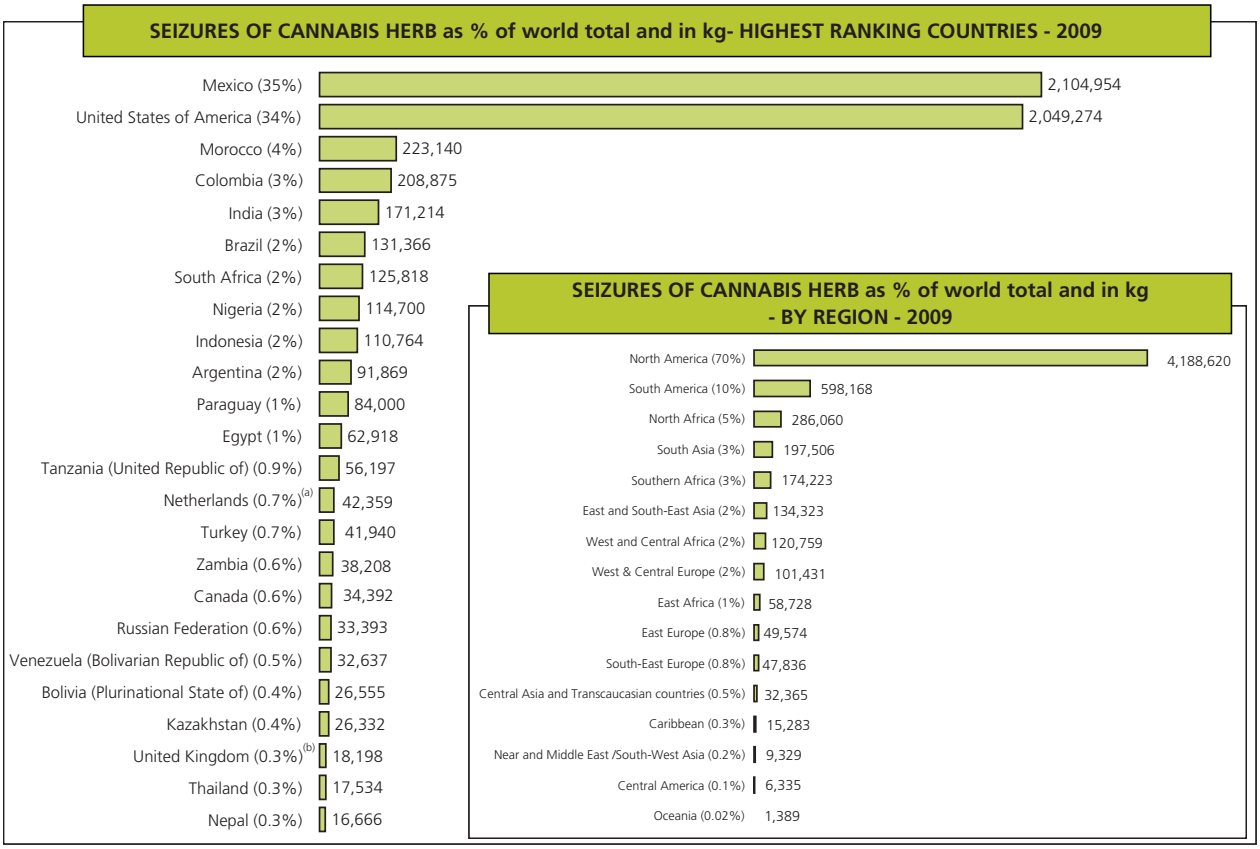
Seizures of cannabis resin in the Americas remained limited. In 2009, seizures rose significantly but at 10.8 mt, remained below 1% of the global total. Nevertheless, Canada has a significant consumer market for cannabis resin. In 2008, almost one half of cannabis resin seizures in the Americas were made by Canada (899 kg). In 2009, Canada seized a much larger quantity - 9.7 mt - in 2,045 individual seizures, two of which together accounted for 82% of the total. Moreover, the trafficking routes for cannabis resin reaching Canada appeared to undergo significant changes. Canada identified the Caribbean, North Africa and South-East Asia as the origin for cannabis resin reaching its territory in 2008, but these were replaced by Southern Africa and South-West Asia in 2009.

In the United States, seizures rose from 367 kg in 2008 to 811 kg in 2009. The United States also assessed that, in 2008, cannabis resin was trafficked both to the United States via Canada (from North Africa), and to Canada via the United States (of Caribbean origin). Seizures of cannabis resin in Mexico rose from 6 kg in 2007 to 297 kg in 2008 – the highest level since 1995. However, seizures fell to 11 kg in 2009. In Brazil, cannabis resin seizures tripled between 2006 and 2008, reaching the record level of 301 kg in 2008, but fell to 204 kg in 2009.

Fig. 168: Global seizures of cannabis herb, 1999-2009



Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Metric tons	4,042	4,680	5,504	5,076	6,295	6,739	4,901	5,932	5,982	5,510	6,022

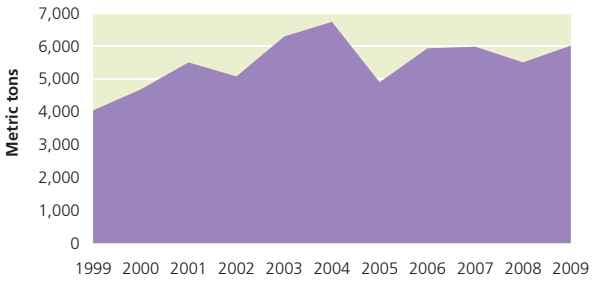


(a) Data relative to 2008. Data for 2009 from the Netherlands were not available.

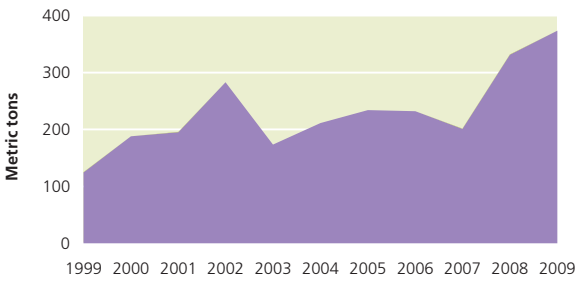
(b) Data for the United Kingdom for 2009 are based on incomplete data for some jurisdictions for the financial year 2009/10, and adjusted for the missing jurisdictions using the latest available complete distribution (relative to the financial year 2006/07).

Fig. 169: Global seizures of cannabis herb, 1999-2009

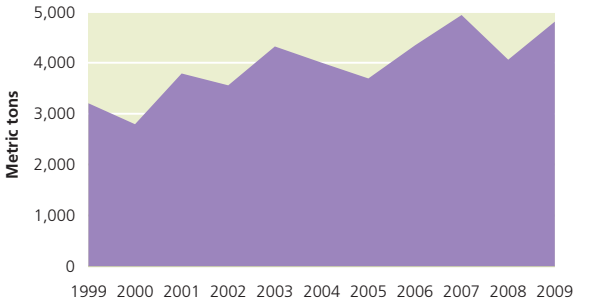
CANNABIS HERB INTERCEPTED - WORLD: 1999-2009



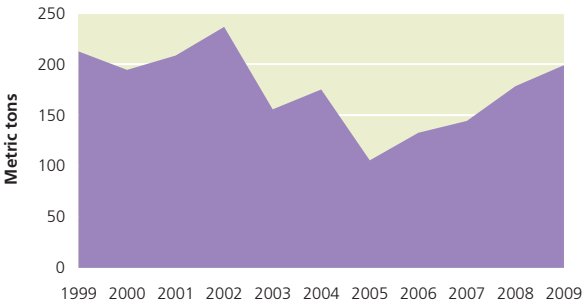
CANNABIS HERB INTERCEPTED - ASIA: 1999-2009



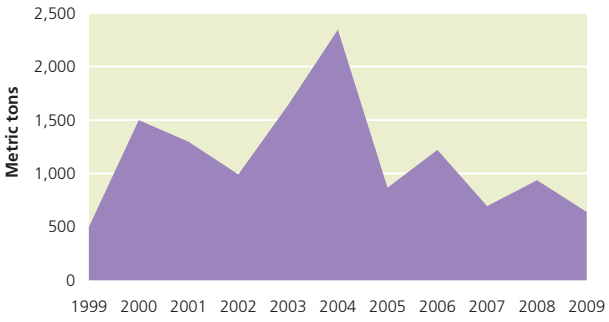
CANNABIS HERB INTERCEPTED - AMERICAS: 1999-2009



CANNABIS HERB INTERCEPTED - EUROPE: 1999-2009



CANNABIS HERB INTERCEPTED - AFRICA: 1999-2009



CANNABIS HERB INTERCEPTED - OCEANIA: 1999-2009

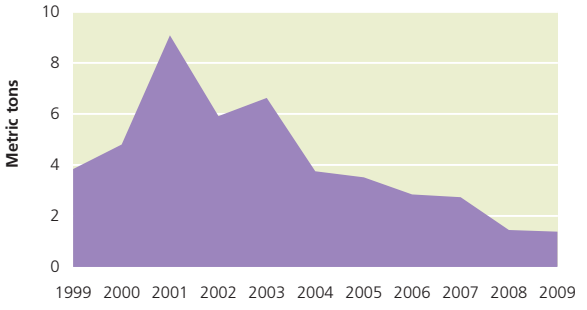
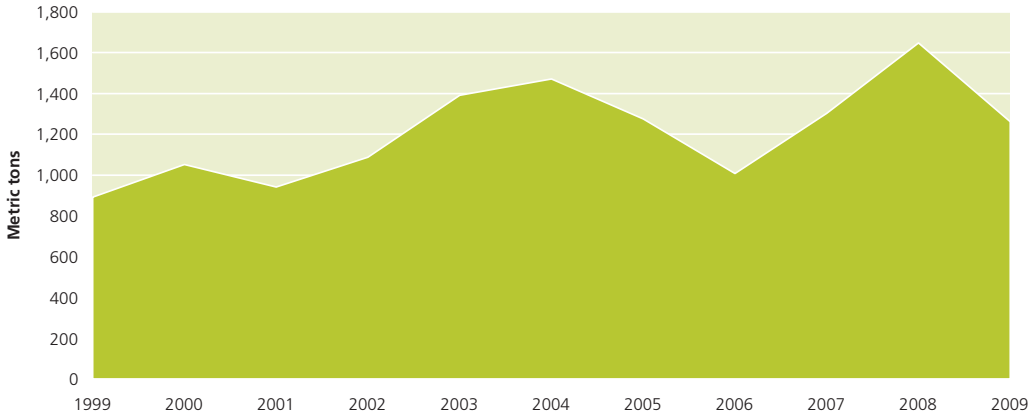
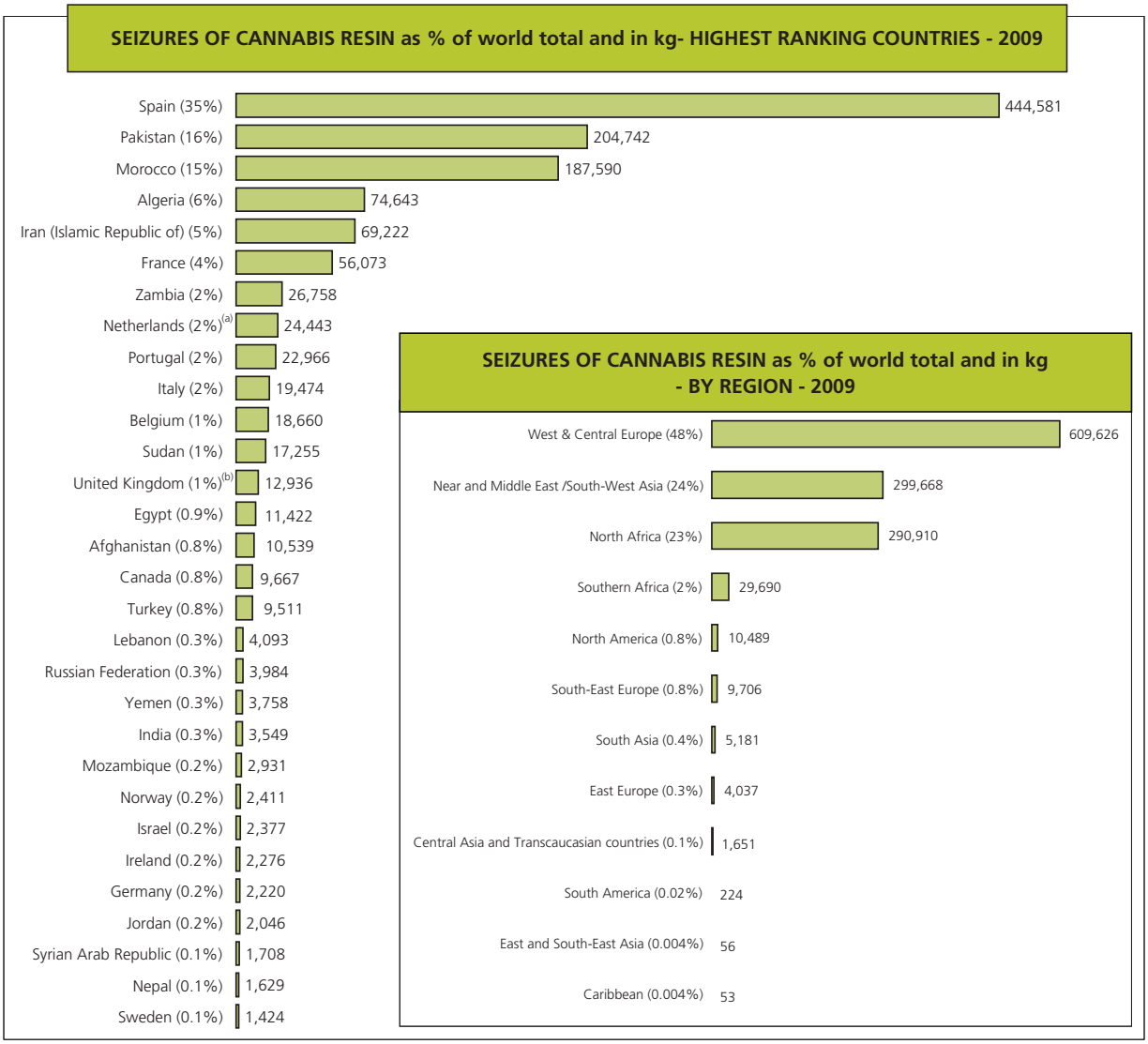


Fig. 170: Global seizures of cannabis resin, 1999-2009



Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Metric tons	891	1,051	942	1,088	1,392	1,472	1,274	1,008	1,303	1,648	1,261

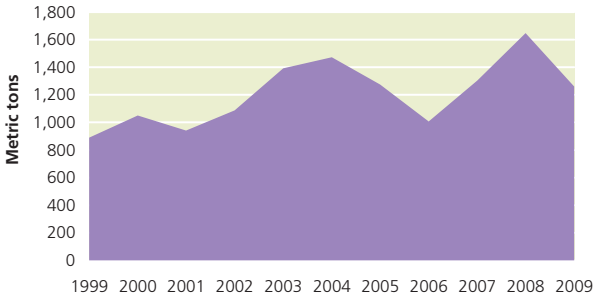


(a) Data relative to 2008. Data for 2009 from the Netherlands were not available.

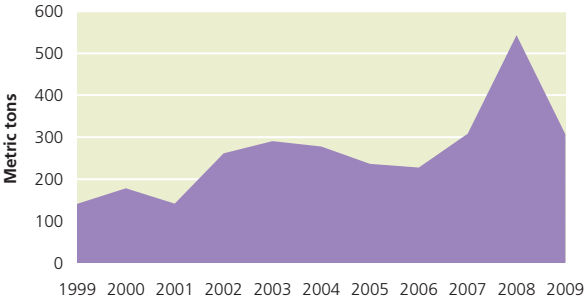
(b) Data for the United Kingdom for 2009 are based on incomplete data for some jurisdictions for the financial year 2009/10, and adjusted for the missing jurisdictions using the latest available complete distribution (relative to the financial year 2006/07).

Fig. 171: Global seizures of cannabis resin, 1999-2009

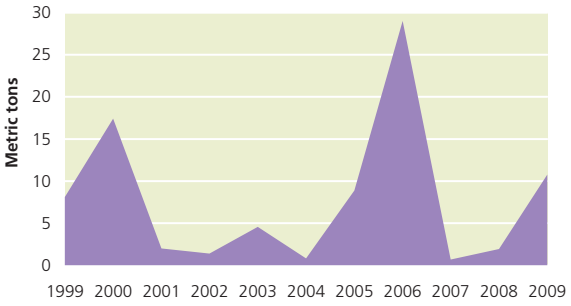
CANNABIS RESIN INTERCEPTED - WORLD: 1999-2009



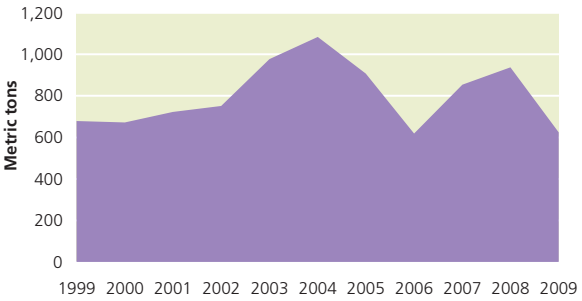
CANNABIS RESIN INTERCEPTED - ASIA: 1999-2009



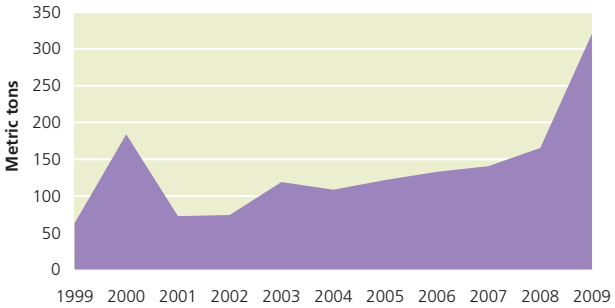
CANNABIS RESIN INTERCEPTED - AMERICAS: 1999-2009



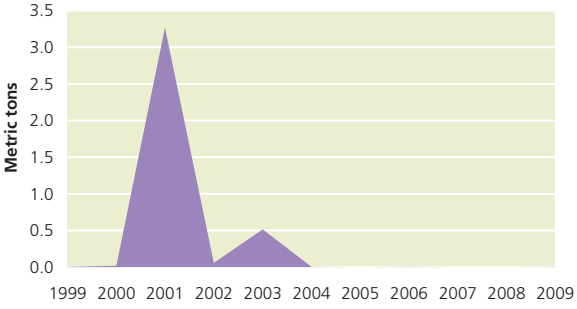
CANNABIS RESIN INTERCEPTED - EUROPE: 1999-2009



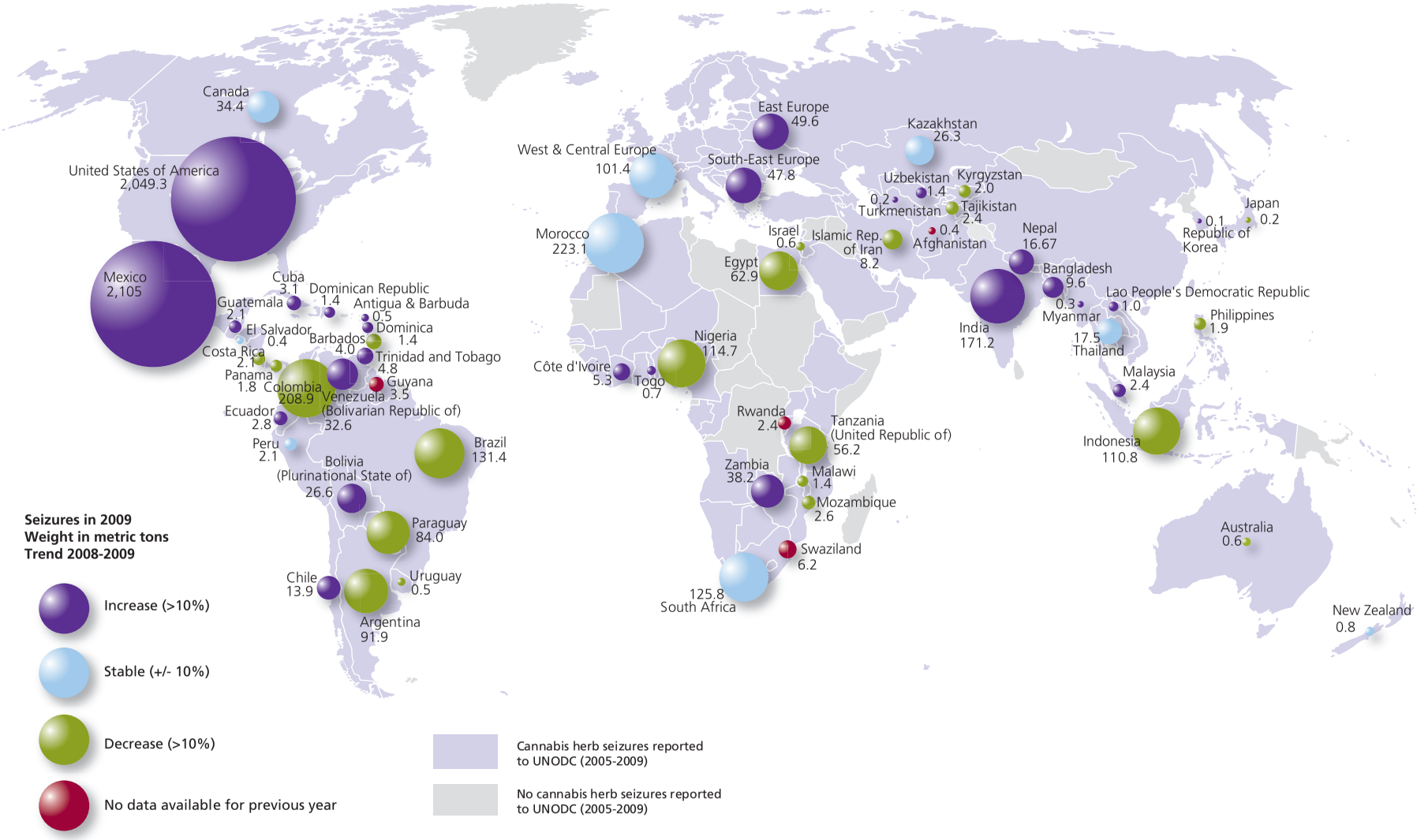
CANNABIS RESIN INTERCEPTED - AFRICA: 1999-2009



CANNABIS RESIN INTERCEPTED - OCEANIA: 1999-2009

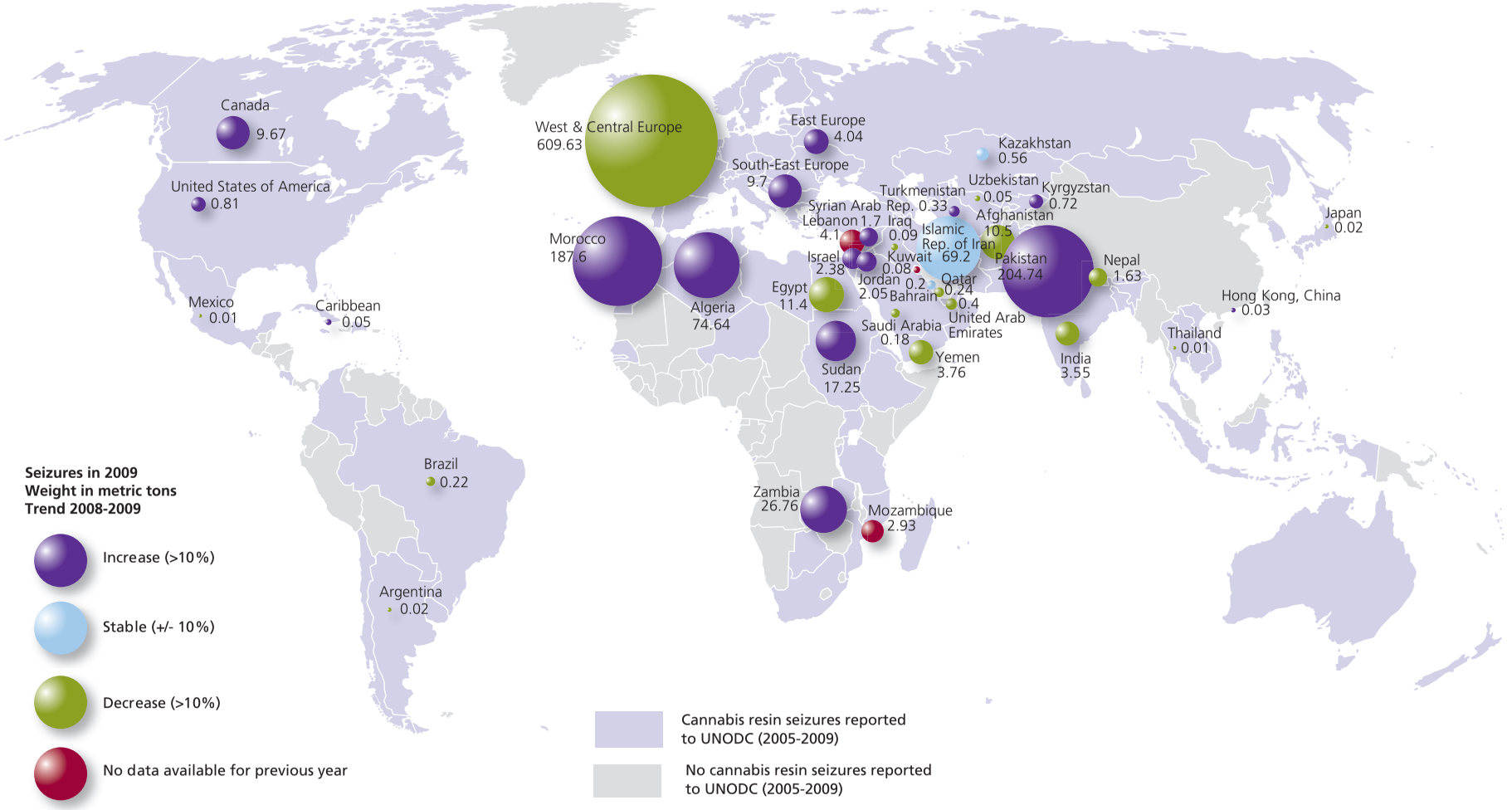


Map 45: Seizures of cannabis herb, 2009 (countries reporting seizures of more than 100 kg)



Source: UNODC Annual Reports Questionnaires data supplemented by other sources
Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

Map 46: Seizures of cannabis resin, 2009 (countries and territories reporting seizures of more than 10 kg)



Source: UNODC Annual Reports Questionnaires data supplemented by other sources
Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.