

1.3 Cannabis market



1.3.1 Summary trend overview

UNODC estimates that between 200,000-641,800 ha were used for outdoor cannabis cultivation in 2008. There are high levels of uncertainty in cultivation estimates as cannabis can be grown - indoors or outdoors - in most countries in the world. Therefore, it is not possible to produce more precise data, as is done for opiates and cocaine. The total cannabis herb production is estimated to range from 13,300-66,100 mt, and for cannabis resin, the estimated production range is 2,200-9,900 mt.

Total cannabis herb seizures increased somewhat in 2007 to reach a total of 5,600 mt. As in 2006, the majority of cannabis herb seizures in 2007 were reported from Mexico and the USA. Cannabis resin seizures also increased to some 1,300 mt, with most seizures reported by countries in West and Central Europe. Resin seizures increased by more than one third in this subregion, compared to 2006.

UNODC estimates that between 143 and 190 million persons globally used cannabis at least once in 2007. Cannabis use seems to be increasing in several countries in Latin America and Africa, whereas in the established markets of North America and Western Europe, there are signs from recent studies that the levels of use are declining, particularly among young people.



1.3.2 Production

The total estimated area for outdoor production of cannabis in 2008 ranges from 200,000-641,800 ha. The total cannabis herb production is estimated to range from 13,300-66,100 mt and the production of cannabis resin from 2,200-9,900 mt. Due to high levels of uncertainty in estimating cultivation, it is not possible to produce more precise data, as is done for opiates and coca/cocaine.

This chapter shows the information that is available and gives an indication of the extent of global cannabis cultivation and production. Minimum and maximum levels of production and cultivation are explored by applying four methods. One method is based on reported cultivation and production, the second is based on seizures of cannabis, and the third and fourth method are based on user prevalence rates.

Availability of data

The cannabis market is the largest illicit drug market in terms of global spread of cultivation, volume of production and number of consumers. Unfortunately, the dominance of cannabis in the drug market is not reflected in the availability of reliable data. The information available on cannabis cultivation and production is fragmented, non-standardized and not always based on scientific research. This complicates the estimation of total global production.

A major source of information for cultivation and production are the responses to the Annual Report Questionnaires (ARQ). The ARQ asks for figures on the extent of cultivation, production and yield. Data on

seizures and their countries of origin are also systematically collected in the ARQs.

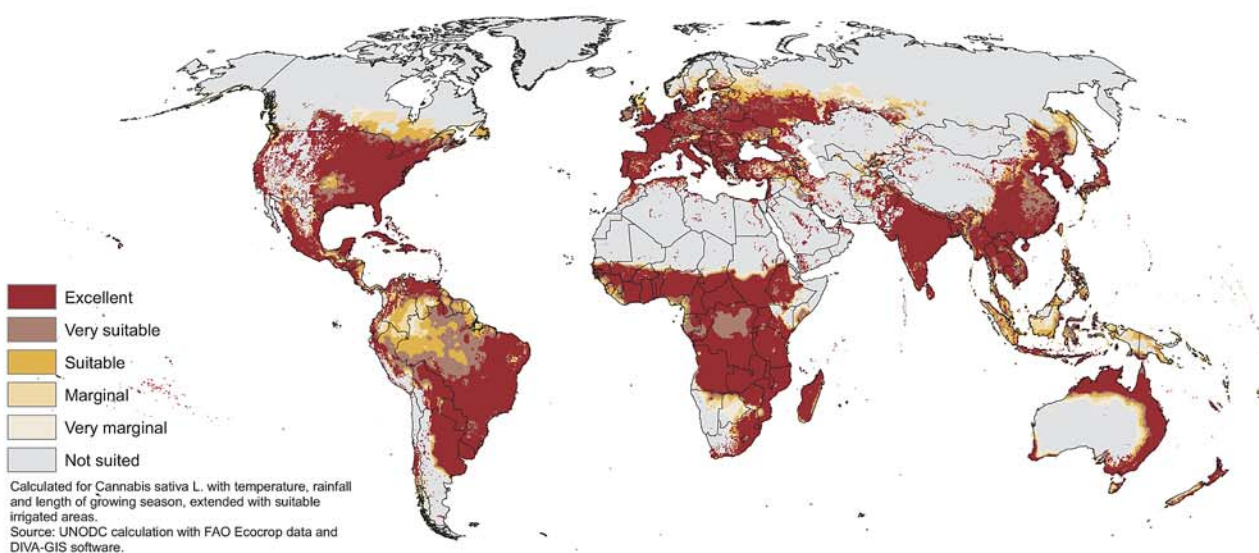
In 2007, 21 countries submitted some information on their cultivation of cannabis, whereas, from previous calculations, about 172 countries that report to UNODC have had some level of cultivation in the past ten years¹ (2008 *World Drug Report*). One of the reasons for this low level of reporting is the difficulty to assess the extent of an illicit crop that is so widespread. The map below shows the suitability of outdoor cannabis cultivation and indicates that practically all countries have suitable areas for outdoor growing of cannabis. The actual areas will be even more extensive due to the cross-breeding of varieties that have broader climate adaptability, which has not been taken into account for this map.² With the possibility to grow cannabis indoors, the potential area could be extended to all areas with access to water and electricity.

Currently, there are very few cannabis monitoring systems that offer scientifically reliable cultivation estimates. In the past, UNODC has assisted in the implementation of cannabis surveys in Morocco (2003-2005) and Central Asia, covering Kazakhstan, Kyrgyzstan and Tajikistan (1998-1999). The Moroccan Government is planning to undertake a new survey in

2010. Furthermore, UNODC is currently planning cannabis surveys in Afghanistan and Paraguay. These new surveys will provide more information on the extent of production in these countries, believed to be two of the world's major cannabis-exporting countries.

Previous attempts to estimate cannabis cultivation used a triangulation calculation, where user rates are combined with information on seizures and cultivation (see 2006 and 2008 *WDR*). However, the paucity of the data makes the outcome tentative and with a large margin of error (Bulletin on Narcotics 2006; 2006 *WDR*). The conclusion from the analysis of global cannabis use and production in the 2006 *World Drug Report* is that too little is known about how and where cannabis is being grown, the sources for consumption and the extent of the users and their use. Not much has changed since 2006. The present analysis makes use of all available data on the production and cultivation of cannabis, taking into account the uncertainty in this field.

Map 13: Climatologically suitable areas for outdoor cultivation of cannabis



- 1 Based on ARQ reports on cultivation in the country, or the identification of another country as a source/origin, or on the countries that reported seizures of cannabis plants, which are obviously locally grown.
- 2 On the other hand, some areas will be less suitable due to unfavourable soil characteristics, like bad drainage or high levels of acidity or alkalinity, which have also not been taken into account for this map.

Global cannabis herb and resin production estimates

Cannabis herb and resin production can be estimated from the supply and from the demand side. An estimate from the supply side can be based on reported seizures or by estimating the total area of cultivation and production per hectare, based on the figures provided by a limited number of countries. For the latter, most countries do not have a national figure for cultivation and do not have the capacity to generate an estimate. The table summarizes the most recent data available for some of the main producing countries as reported in the ARQs and other sources. The figures given in the table are in herbal equivalents, and the total shows a range of herbal production of some 88,000-110,000 mt. This does not include important producing countries like Afghanistan,³ Democratic Republic of the Congo, Ghana, Jamaica, Nigeria and Pakistan, and should therefore be considered as an absolute minimum figure of global production.

These figures are given in herbal equivalent volumes, and are therefore not comparable with the figures calculated in the 2008 *WDR*. They cannot be used to describe trends.

Another way to estimate cannabis production is to use data on seizures reported in the ARQs and multiply

them by an estimated rate of interdiction. Cannabis seizures are reported as herb, plants or resin. The interception rate for herbal cannabis and cannabis plants is estimated to range between 10-20%, whereas the interception rate for resin is likely to be a bit higher, at least 17% (*Bulletin on Narcotics*, 2006). These interception rates were combined with conversion rates for resin and plants to calculate the total production range of each drug.

The third way to estimate production is based on the demand for cannabis from the calculated number of cannabis users and the average use per year. This provides the amount of herbal and resin cannabis production required to satisfy global demand. The estimates for average use per year has a high variability depending on the users' habits, the method of consumption and the quality of cannabis products. The literature mentions average use estimates between 60-200 g per year, without making a distinction between cannabis resin and herbal cannabis. These levels of use give a demand volume of 9,000-51,000 mt. About 10-17% of the use is estimated to be consumed as cannabis resin. Applying these factors and adding the amount of cannabis herb, cannabis plants (in herbal equivalents) and resin, respectively, gives a required production volume of some 13,300-52,400 mt of cannabis herb and 2,200-9,900 mt of cannabis resin.

Table 9: Available information on cannabis production in the major producing countries 2008⁴

Country	Cultivated area (ha)	Eradicated area (ha)	Harvestable area (ha)	Herbal production (mt)
Morocco	60,000 ⁵		60,000 ⁵	43,850 ⁵
Mexico		21,357 ⁴ (2007) 18,562 ⁴ (2008)	8,900 (2007) ⁷	27,806 ⁴ (2007) 15,800 ⁷ (2008)
Paraguay	6,000 ⁶	1,693 ⁴ (2007)	6,000 ⁶	16,500 ⁶
Kazakhstan (1999)	124,000-329,627 ⁸			3,000-6,000 ⁷
South Africa	1,500-2,000 ⁹		1,500-2,000 ⁹	
Colombia (2006)	5,000 ¹⁰			4,000 ¹⁰
USA		6.6 million outdoor plants / 430 000 indoor plants ⁷		3,149-7,349 ¹¹
Canada				1,399-3,498 ¹²
Netherlands		851,510 plants ⁷		36-99 ¹³ 625 ⁷
Lebanon	3,500 ⁷		3,500 ⁷	
Total	200,000-406,000			87,734-109,628

3 UNODC was not able to provide reliable estimates for cannabis cultivation in Afghanistan during the *Opium Poppy Survey 2008*.

4 Annual Reports Questionnaires, 2007.

5 Official Government communication 26/02/2009, in Lutte antidrogue - Synthèse 2008, Min of Interior. Herbal production, which was calculated from the reported resin production of 877 mt, refers to gross cannabis production and is not necessarily directly comparable to herbal production of other countries.

6 Secretaria Nacional Antidrogas (SENAD), 2008.

7 US Department of State, *International Narcotics Control Strategy Report* (INCSR), 2009.

8 Annual Survey reports Cannabis, Opium Poppy and Ephedra, 1998 and 1999. UNDCP. Includes areas of wild growth.

9 INCSR 2009; expert opinion; some top-end estimates are that 20,000-30,000 hectares of arable land are used to grow cannabis.

10 *Bulletin on Narcotics* 2006.

11 UNODC, calculated with the number of eradicated plants, using the method applied by the US National Drug Intelligence Center, 2007.

12 Public Safety Canada, 2009. http://www.publicsafety.gc.ca/prg/le/oc/_fl/us-canadian-report-drugs-eng.pdf.

13 Van der Heijden, 2003. De Nederlandse Drugmarkt. Korps landelijke politiediensten, Dienst Nationale Recherche Informatie.

Table 10: Estimated volume of cannabis herb and resin based on seizure data

Sources: *2009 WDR and **Bulletin on Narcotics 2006.

	Seizures* (mt)	Interception rate**		Conversion rate		Production (mt)	
		Low	High	Low	High	Low	High
Cannabis herb	5,557	0.1	0.2	-	-	28,025	56,050
Cannabis plants	5,020	0.1	0.2	0.1	0.2	2,510	10,040
Total cannabis herb						30,535	66,090
Total cannabis resin	1,296	0.17	0.2	-	-	6,480	7,624

Table 11: Total cannabis demand, based on average user consumption

Sources: *Van der Heijden, 2003. De Nederlandse Drugsmarkt. Korps landelijke politiediensten, Dienst Nationale Recherche Informatie and **2008 WDR; neither source differentiates between cannabis resin and herbal use.

	Number of users 15-64 year		Average use (kg/user/year)		Calculated use (mt)	
	Low	High	Low*	High**	Low	High
Africa	29,545,844	120,459,807	0.06	0.2	1,773	24,092
Asia	40,912,205	59,464,983	0.06	0.2	2,455	11,893
Europe	28,888,570	29,660,039	0.06	0.2	1,733	5,932
North America	31,262,302	31,262,302	0.06	0.2	1,876	6,252
Oceania	2,455,307	2,572,840	0.06	0.2	147	515
South America	10,457,999	11,083,110	0.06	0.2	627	2,217
Global total	143,522,228	254,503,082	0.06	0.2	8,611	50,901

Table 12: Estimated global production of cannabis herb and resin, based on average user consumption

Source: *Based on the proportion of seizures. 17% of the seizures were cannabis resin, however this is most probably an overestimation of the proportion of use since resin is more trafficked abroad and has higher chances of being seized. The lower proportion is assumed to be 10%. ** In herbal equivalents, applying a factor of 0.1 and 0.2 to plant seizures for the low/high estimates, respectively.

	Use (mt)		Correction factor for proportion of cannabis resin use*		Calculated cannabis production (mt)	
	Low	High	Low	High	Low	High
Total cannabis use	8,611	50,901				
Cannabis herb use			83%	90%	7,147	45,811
Cannabis herb/plant seizures**					6,107	6,609
Total cannabis herb production					13,254	52,420
Cannabis resin use			10%	17%	861	8,653
Cannabis resin seizures					1,296	1,296
Total cannabis resin production					2,157	9,949

Instead of using a simple average for all users, according to a typology reported in the *Bulletin on Narcotics* (2006), users can be differentiated and classed as casual users, regular users, daily users and chronic users. Casual users (45%) are people who share cannabis cigarettes an average of four times per year (0.6 grams/year). Regular users (41%) use more advanced inhaling techniques with higher frequency, on average 100 times per year (15 g/year). Daily users (9%) use one to four cannabis cigarettes per day (320 g/year) and chronic users (4%) who reach ten cigarettes per day (1,825 g/year).

Applying these user rates and the same conversion factors as in the former estimation method (proportion of cannabis resin use and conversion rate) give a total of cannabis used for consumption which ranges between 20,000-33,200 mt of cannabis herb and 3,000-6,300 mt of cannabis resin.

The calculated estimates, using the four different methods, indicate the large range of uncertainties in estimating the worldwide cannabis herb and resin production. A final range can be constructed by considering the different estimates. The final global production figure can

Table 13: Calculation of the volume of cannabis demand, based on amounts of use by user typology

Typology	% of users	Use (gram/year)	Min demand (mt)	Max demand (mt)
Casual	45	0.6	39	69
Regular	41	15	888	1,575
Daily	9	320	4,306	7,635
Chronic	4	1,825	11,459	20,320
Total	100	172*	16,692	29,599

* weighted average

Table 14: Estimated volume of cannabis herb and resin demand, based on amounts of use by user typology

* Based on the proportion of seizures. 17% of the seizures were cannabis resin, however this is most probably an overestimation of the proportion of use since resin is more trafficked abroad and has higher chances of being seized. The lower proportion is assumed to be 10%. ** In herbal equivalents, applying a factor of 0.1 and 0.2 to plant seizures for the low/high estimates, respectively.

	Calculated use of cannabis*	
	Low	High
Cannabis herb	13,854	26,639
Cannabis herb/plant seizures*	6,107	6,609
Total cannabis herb production	19,961	33,248
Cannabis resin	1,669	5,032
Cannabis resin seizures	1,296	1,296
Total cannabis resin production	2,965	6,328

Table 15: Summary of cannabis herb and resin production estimates

Method	Cannabis herb (mt)		Cannabis resin (mt)	
	Minimum	Maximum	Minimum	Maximum
Seizure based calculation	30,535	66,090	6,480	7,624
User based calculation – average use total population	13,254	52,420	2,157	9,949
User based calculation – average use by user type	19,961	33,248	2,965	6,328
Ranges	13,254	66,090	2,157	9,949

vary from 13,300-66,100 mt of cannabis herb and 2,200-9,900 mt of cannabis resin.

To convert these figures into cultivation area, a distinction should be made between indoor and outdoor cultivation, since acreage for indoor cultivation is not a very meaningful unit. Indoor cultivation is not area restricted due to the potential use of several floors in one building and the large number of harvests per year.¹⁴ Outdoor cannabis yields can also vary largely, for example, due to climate variances and the use of irrigation, but these yields probably have a smaller range.¹⁵ Assuming aver-

age outdoor yields for herb from 470-1,200 kg/ha (2008 WDR) and assuming that 80-95% of the total production takes place outside, gives a range of cultivated area varying broadly between 25,800-641,800 ha. For cannabis resin, yield per hectare could be derived from surveys in Morocco and Afghanistan. The average yield in Morocco, where most cannabis is grown on rain-fed land, was used for the lower estimate, and the yield from Afghanistan, where most cannabis is grown on irrigated land, for the higher estimate.¹⁶

14 Indoor crops can have up to 6 harvests per year, with a yield of 5,000 kg/ha confirmed by several sources. This makes indoor cropping 15-30 times more productive than outdoor crops (*Bulletin on Narcotics*, 2006).

15 Yields vary from 5 kg/ha to 40,000 kg/ha, reflecting ranges between wild cannabis and hydroponically grown cannabis. The median cannabis yield was 770 kg/ha. Typical yield for outdoor cannabis varies

between 470 kg/ha without irrigation to 5,000 kg/ha in well-tended gardens, with figures around 2,000 kg/ha typical for the situation in the USA (as identified through the analysis of data from court cases), and levels around 1,000 kg/ha typical for developing countries. In contrast, hydroponically grown cannabis were found to reach typical yield levels from 15,000-30,000 kg/ha. (WDR 2008).

16 Sources: UNODC/Govt. of Morocco: *Enquête sur le cannabis*, 2004 and 2005. The lower average resin yield of the two years 2004 and 2005 was taken for the lower estimate. Afghanistan: UNODC/Min.

Fig. 52: Ranges of global estimates of cannabis herb production by methodology

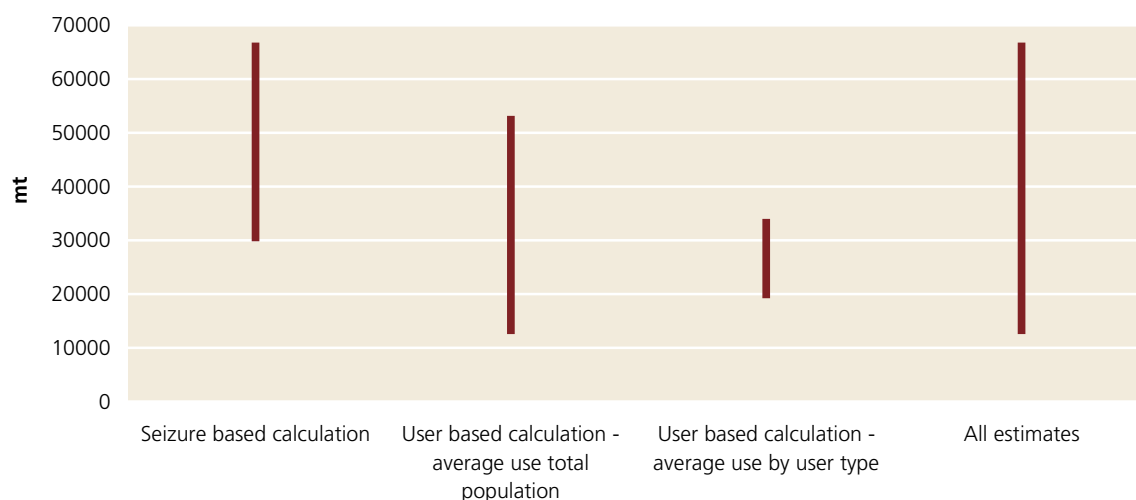


Fig. 53: Ranges of global estimates of cannabis resin production by methodology

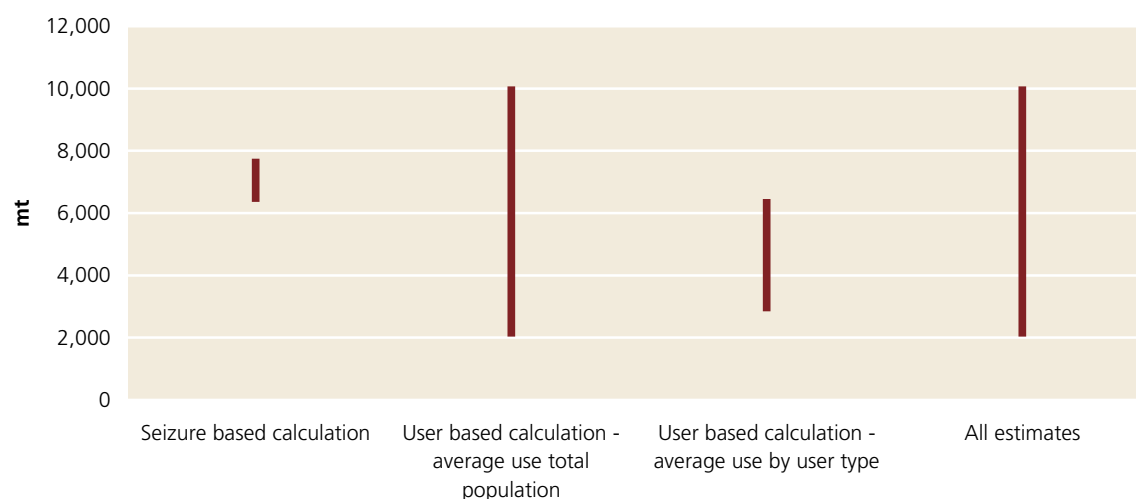


Table 16: Estimation of outdoor cultivation area from the calculated production range

	Production range (mt)		Proportion of outdoor cultivation		Average outdoor yield kg/ha*		Cultivation area (ha)	
	Low	High	Low	High	Low	High	Low	High
Cannabis herb	13,254	66,090	80%	95%	470	1,200	8,836	133,586
Cannabis resin	2,157	7,624	-	-	15	125	17,256	508,235
Total							(25,757) 200,000	641,821

Since the cultivation area in Morocco alone ranged from 60,000-130,000 ha in the period of 2004-2008, it is better to use the sum of the known cultivated areas as an absolute minimum, which is 200,000 ha. Thus, the estimated area under cannabis cultivation ranges from

about 200,000-641,800 ha. Outdoor cultivation can also give several harvests in one year¹⁷ but this has not been taken into account here, which makes the calculated area an absolute maximum for the calculated production.

of Counter Narcotics (2008): Baseline information on cannabis cultivation. The median of 81 farmer responses was used for the higher estimate.

¹⁷ Especially at lower-latitude locations, where temperature and day length are less restricting.

Trends by country

Since few countries report the extent of their own cannabis production, it is difficult to analyze any global trends from these data. However, there are more reports on the origin of cannabis in the market of each country. UNODC collects data on countries of origin of annual and individual seizures through the ARQ and a questionnaire on individual seizures. This information provides some indication of the trends in the main producing countries. The table below shows the main source countries of cannabis herb. The Netherlands, South Africa, Albania, Jamaica and Paraguay have been seen as principal producers of cannabis herb for about 25% of the cannabis herb market, because seized cannabis originated there. In 2005-2007, Colombia and Nigeria were added to the list. However, almost 76% of the entries refer to source countries which are mentioned less than 10 times in a 3-year period. There are only insignificant changes between the two time periods.

Cannabis resin production

The picture for cannabis resin is clearer because the production of resin is concentrated in relatively few countries and it is trafficked across borders more often. Morocco is known to be the world's main source of cannabis resin. The Government of Morocco reported further reduction of the cannabis production in 2008, reporting 60,000 hectares in production after eradication, following a decrease observed in the 2005 survey by the Government of Morocco and UNODC. This decline is, however, not reflected in the data reported by countries on the origin of their seized cannabis resin. Both in the ARQs and in the Individual Seizure Database, Morocco continues to be the principal supplier of resin in the world. In the ARQs, the proportion report-

edly of Moroccan origin has increased in the period 2005-2007, compared to 2001-2004.

Afghanistan is the second most prominent cannabis resin producer, with a small increase in the figures from the annual seizures. Nine per cent of source countries in 2005-2007 pointed to Afghanistan, compared to 6% in 2001-2004. Another indication of the importance of Afghanistan as a cannabis producer is the report of a very large seizure in 2008, amounting to some 237 mt in one stockpile.¹⁸ Although there is no reliable figure available for cannabis cultivation in Afghanistan in 2008, experts believe that the extent of cannabis production is approaching the cultivation area of Morocco with steadily increasing production due to the relatively higher prices for cannabis products, compared to opium. At the end of 2008, UNODC performed a baseline study on cannabis cultivation in Afghanistan and identified 20 out of 34 provinces with substantial cannabis cultivation. A first cannabis survey is being planned by the Afghanistan Ministry of Counter Narcotics and UNODC in 2009.

India and Nepal are also identified as source countries (4%). Some CIS countries are increasingly (6%) mentioned as a source for cannabis resin, mainly due to new reports from Azerbaijan, in addition to reports from Ukraine, the Republic of Moldova, the Russian Federation and Armenia. Pakistan continues to be an important source according to both annual and individual seizure information. The Central Asian countries, mainly Kazakhstan and Kyrgyzstan, are only mentioned as sources in the annual seizures. The main production area in Central Asia is the Chu Valley in Kazakhstan where cannabis - for both herb and resin production - grows on extensive wild and cultivated areas, estimated to total more than 300,000 ha.

Table 17: Main source countries of cannabis herb according to reported seizures in the ARQs, 2005-2007 and 2002-2004

Source: UNODC Annual Reports Questionnaire data.

Source country	2005-2007		2002-2004	
	Number of mentions as a source country	Proportion (%) of all reporting countries*	Number of mentions as a source country	Proportion (%) of all reporting countries*
Netherlands	38	8%	36	8%
South Africa	15	3%	14	3%
Albania	14	3%	20	4%
Jamaica	12	3%	14	3%
Colombia	11	2%	7	1%
Paraguay	10	2%	12	3%
Nigeria	10	2%	7	1%
Others	1 to 9 times	76%	1 to 9 times	77%
Total	458	100%	485	100%

* Cumulative reporting for three years. Countries may report more than once.

¹⁸ ISAF, 2008, <http://www.nato.int/isaf/docu/pressreleases/2008/06-june/pr080611-246.html>.

Algeria and the Islamic Republic of Iran have recently emerged as a significant source country for individual seizures. Iran is also mentioned as a source by 3% of the annual seizures as reported in the ARQ. It might be an indication of Iran being increasingly used as a transit country.

The Netherlands is mentioned as a country of origin for resin, but it is not clear to what extent the cannabis resin actually originates there. Although the Netherlands is an important producer of cannabis herb, available information suggests that resin production is limited. The same might be true for other Western European countries such as France, Germany and Belgium that are mentioned in the annual seizures, but it is not clear to what extent they are transit countries.

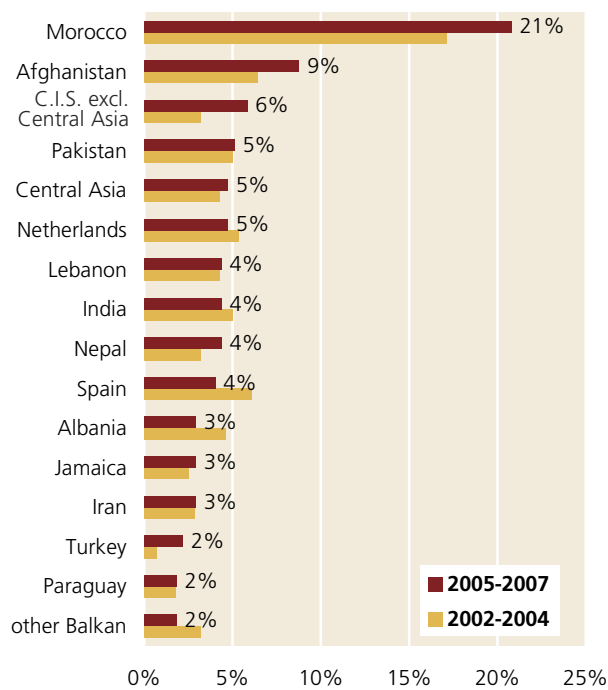
Albania's importance as an exporter of cannabis in general and specifically of resin seems to have diminished. Only 3% of the countries mention Albania as an exporter and it seems to be cultivating mostly for local/regional use.¹⁹ Seizures of herbal cannabis from Albania have become very rare in the last five years.²⁰

Lebanon continues to be a source country in the Middle East. Production in Lebanon has declined drastically compared to the early 1990s, but farmers appear to be resuming cannabis cultivation.

Overall production and consumption of cannabis resin in the Americas are limited. The most important resin producer in the region is Jamaica (3% of annual seizures). Paraguay is also mentioned in 2% of the cases but is more important as a cannabis herb producer. The cultivation area in Paraguay is estimated at 6,000 ha.²¹

Fig. 54: Main source countries of cannabis resin according to the ARQs in the period 2005-2007 and 2002-2004*

*Number of times that countries were identified as source countries, represented as proportion of countries reporting.
Source: UNODC, Annual Reports Questionnaire data.



UNODC has had consultations with relevant Government institutions to conduct a survey in Paraguay to collect more precise information.²²

Table 18: Main source countries of cannabis resin seizures according to the Individual Seizure Database in the period 2005-2007 and 2002-2004

Source: UNODC, Individual Seizure Database.

Source country	2005-2007		Source country	2002-2004	
	No. of seizures	Quantity (kg)		No. of seizures	Quantity (kg)
Morocco	811	440,747	Morocco	1,243	468,727
Afghanistan	1,083	144,387	Afghanistan	1,113	172,565
Spain	853	19,226	Pakistan	22	16,400
Pakistan	10	2,825	Spain	84	16,072
Netherlands	27	2,615	Netherlands	20	9,047
Portugal	1	2,449	Portugal	2	7,207
France	3	2,135	France	7	2,216
Germany	5	591	Belgium	9	1,764
Algeria	16	455	South Africa	6	926
Iran (I.R. of)	13	450	Germany	6	771

19 INCSR 2009.

20 World Customs Organization, *Customs and Drugs Report 2007*.

21 Secretaria Nacional Antidrogas (SENAD), 2008

22 The Government of Brazil has also been involved in the consultations as Brazil is likely to fund the survey.

Why does cannabis potency matter?

Cannabis products dominate the world's illicit drug market. The term **cannabis**, however, refers to different types of preparations derived from the plant *Cannabis sativa*, which all contain chemical substances called **cannabinoids**. The most psychoactive of these substances is Δ -9-tetrahydrocannabinol (THC). The amount of THC in a cannabis sample is generally used as a measure of "cannabis potency". In recent years, several claims of increased cannabis potency have been made.

One driving force behind the interest in cannabis potency is the possible link to mental health problems.¹ It is thought that high potency cannabis may have the potential to be more harmful.² Also significant may be the ratio between THC and cannabidiol (CBD), another cannabinoid believed to moderate the effect of THC. Considering the large population of cannabis users worldwide, it is important that the link between mental health problems and cannabis potency is understood.

What do we know about trends in cannabis potency?

A number of studies have been carried out to assess potential changes in potency over time. One of the most comprehensive was conducted in 2004 by the European Monitoring Centre on Drugs and Drug Addiction (EMCDDA) and concluded that a modest increase in aggregate cannabis potency had occurred, possibly related to the use of intensive indoor cultivation methods. The authors noted that THC content nonetheless varied widely.³ While the United Kingdom Home Office study in 2008⁴ found little change: from a median potency of sinsemilla cannabis of 14% among samples in 2004/5 compared to 15% in 2008, long-term increases have been reported in the United States⁵ with an average potency of 10% in 2008.

Multiple methodological issues have been raised, which impact on our capacity to generate comparable data and infer trends.⁶ Important variables to be considered include the phytochemistry;⁷ type of cannabis product; cultivation method; sampling; and stability. As detailed below, each of these can affect the potency estimates. Only through examining these factors can we have a more systematic,

scientific and comparable assessment of cannabis potency between places and over time.⁸

Plant part used: The secretion of THC is most abundant in the flowering heads and surrounding leaves. The amount of resin secreted is influenced by environmental conditions during growth (light, temperature and humidity), sex of the plant, and time of harvest. The THC content varies between parts of the plant: from 10-12 % in flowers, 1-2 % in leaves, 0.1-0.3 % in stalks, to less than 0.03 % in the roots.

Product type: There are three main types of cannabis products: herb (marijuana), resin (hashish) and oil (hash oil). *Cannabis herb* comprises the dried and crushed flower-heads and surrounding leaves. It often contains up to 5% THC. Sinsemilla, derived from the unfertilized female plant, can be much more potent, however. *Cannabis resin* can contain up to 20% THC. The most potent form of cannabis, however, is *cannabis oil*, derived from the concentrated resin extract. It may contain more than 60% THC. The increase in market share of a particular product type can influence the reported average potency values. For example, the reported rise in the average THC content to 10% in seized samples in 2008 by the United States Office of National Drug Control Policy is associated with a market share of 40% for high potency cannabis (presumably indoor-grown).⁹

Cultivation methods: The cannabis plant grows in a variety of climates. The amount and quality of resin produced depends on the temperature, humidity, light and soil acidity/alkalinity. Outdoor-produced herbal cannabis, therefore, shows considerable variation in potency. Intensive indoor cultivation of female plants and clones, under artificial light, often without soil (hydroponic cultivation), and optimised cultivation conditions, produces cannabis of a consistently higher potency.

Sampling: Most data on cannabis potency are derived from the analysis of seized samples. This means that these samples need to be representative of the entire seizure so that inferences and extrapolations can be made.

Stability: THC is converted to cannabiol on exposure to air and light. This process reduces the THC concentration, especially in old samples which have not been stored under suitable conditions (such as a dark, cool place). It is believed that claims of increases in potency of cannabis preparations confiscated over a period of 18 years in the United States¹⁰ may have been affected by the stability of THC in old samples.

1 Ashton CA, Pharmacology and effects of cannabis, a brief review. *British journal of Psychiatry* 2001; 178:101-6.

2 Smith H, High potency cannabis; the forgotten variable. *Addiction* 2005; 100: 1558-60.

3 EMCDDA, An overview of cannabis potency in Europe. 2004.

4 Hardwick S and King L. Home Office Cannabis Potency Study 2008.

5 Office of National Drug Control Policy, Press Release May 14, 2009.

6 McLaren J, Swift W, Dillon P and Allsop S. *Addiction* 2008; 103: 1100-09.

7 Phytochemistry refers to the chemical composition of plants.

8 Hunt N, Lenton S, and Witton J, Cannabis and mental health: Responses to the Emerging Evidence. Beckley Foundation Report, 2006: No 8.

9 Office of National Drug Control Policy, Press Release May 14, 2009.

10 ElSohly MA et al. Potency trends of delta-9-THC and other cannabinoids in confiscated marijuana from 1980-1997. *Journal of Forensic Science* 2000; 45:24-30

1.3.3 Trafficking

Seizures of cannabis herb and resin

Global seizures of both cannabis herb and resin increased in 2007. Seizures of cannabis herb amounted to 5,600 mt, whereas for resin, the total was some 1,300 mt. An overwhelming proportion of all cannabis herb seizures was made in the Americas (82%), mainly in Mexico and the USA, which together accounted for almost two thirds of global herb seizures. Most of the global increase in cannabis resin seizures was due to a strong increase in West and Central Europe, where seizures were up 33% compared to 2006.

The two main cannabis products, cannabis herb (also known as marijuana), and cannabis resin (commonly marketed under the name hashish), are considerably different in several aspects. The production areas for cannabis resin are much more limited in geographic terms than those of cannabis herb. Moreover, consumption of cannabis resin is concentrated in, although not limited to, West and Central Europe, while the use of cannabis herb is widespread. Thus, quite different regional and international trafficking and seizure patterns become apparent when comparing cannabis herb and resin. A specific feature of cannabis herb is that sizable amounts are thought to be produced in the countries of consumption. This is likely to lower the probability of cannabis being seized by customs and border authorities,

which in many countries contribute heavily to the overall amount of drugs seized. In spite of this, a much higher number of countries and territories reported seizures of cannabis herb (165) to UNODC in the period 2005-2007 than cannabis resin (120), which can be taken as an indication of its wider use and its broader geographical spread.

Cannabis herb seizures amounted to 5,605 mt in 2007, whereas resin seizures amounted to 1,300 mt. Both herb and resin seizures were higher in 2007 than in 2006 and 2005. However, comparing total seizures during this period, the total is still lower than in 2002-2004, when global seizures of cannabis reached record highs. Small quantities of cannabis oil were also seized in 2007 (equivalent to 418 kg).

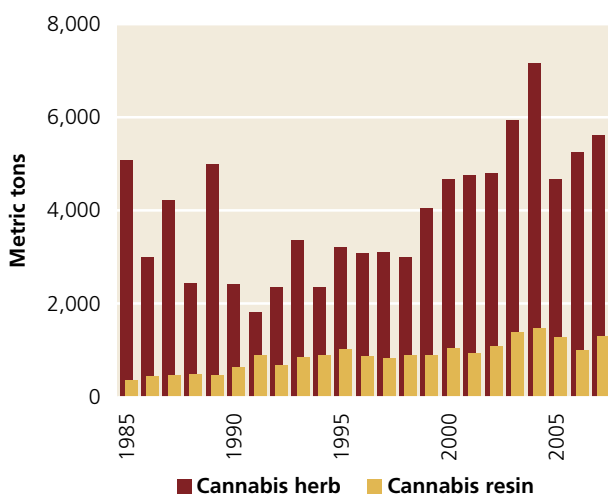
The majority of cannabis herb seizures in 2007 were reported from Mexico (39% of the world total), followed by the USA (26%), Bolivia (Plurinational State of) (8%), Nigeria (4%), Morocco (4%), Colombia (3%) and Paraguay (3%). South Africa and Malawi, which had ranked third and fourth in 2006 after the USA and Mexico, reported much lower seizures in 2007.

Most seizures of cannabis resin, on the other hand, were made by Spain (50%), followed by Morocco (9%), Iran (Islamic Republic of) (7%), Pakistan (8%), Afghanistan (6%), Belgium (5%), Portugal (3%) and France (3%).

176 countries and territories reported cannabis seizures (both herb and resin) to UNODC in the period 2005-2007.

Fig. 55: Cannabis herb and resin seizures (mt), 1985-2007

Source: UNODC, Annual Reports Questionnaire / DELTA



Most cannabis herb seizures are reported by North America

In contrast to other drugs, trafficking in cannabis herb continues to be mostly intraregional. In 2007, an overwhelming proportion of all cannabis herb seizures was made in the Americas (82%), mainly in Mexico (2,177 mt) and the USA (1,447 mt), which together accounted for almost two thirds of global herb seizures. Cannabis herb seizures increased both in the USA and Mexico in 2007 compared to the previous year.

South America including Central America and the Caribbean accounted for 17% of global cannabis herb seizures. The largest seizures were made in Bolivia (Plurinational State of) (424 mt), which reported over

three times more cannabis herb seizures than in 2006, followed by Colombia (183 mt), Paraguay (172 mt), Argentina (75 mt) and Venezuela (Bolivarian Republic of) (25 mt). In the period 2005-2007, Paraguay was mentioned as the source of cannabis herb seized in South America more often than other countries in the region. However, many other countries were mentioned as well, including Bolivia, Brazil, Colombia and Peru. Paraguay was also reported several times as the source of cannabis resin.

Large seizures were also made in Africa, accounting for 11% of global cannabis herb seizures. In 2007, more seizures were made in Morocco, several West African countries and Kenya. Less seizures were reported from Egypt, Malawi and South Africa, which resulted in an overall decline in herb seizures for Africa as a region compared to one year earlier.

The largest cannabis herb seizures made in Asia – which accounted for 4 % of all seizures in 2007 – were reported by India (108 mt), followed by Indonesia (32 mt), Kazakhstan (22 mt), Thailand (15 mt) and Nepal (8 mt).

Cannabis herb seizures in Europe – representing 3% of the world total in 2007 – increased slightly but remained well below the seizure levels reached between 1997 and 2004. As in 2006, the largest seizures were reported by the Russian Federation (27 mt), Turkey (26 mt) and the United Kingdom (20 mt).¹ Europe is the only region which also “imports” significant amounts of cannabis herb from other regions.

Oceania reported only a small fraction of global seizures in 2007 (2.7 mt), most of which was reported by Australia (2.4 mt).

Main cannabis resin trafficking routes run from Morocco and South-West Asia to West and Central Europe

In 2007, global cannabis resin seizures increased by 29% and accounted for 1,296 mt, which was higher than in most years since 1985 with the exception of 2003 and 2004. A large number of countries reported resin seizures in the period 2003-2007 though this was smaller than the number of countries reporting seizures of cannabis herb. Trafficking patterns seem to follow the established routes from the two main resin production areas in Morocco and South-West Asia to the main consumption areas in West and Central Europe. As the consumption of cannabis resin is mainly concentrated in West and Central Europe, trafficking to other regions, as reflected in seizures, took place at a far lower level.

Most seizures of cannabis resin reported by countries of West and Central Europe

Most of the global increase in cannabis resin seizures was due to a 33% increase in West and Central Europe, compared to 2006. In 2007, 849 mt - two thirds of global cannabis resin seizures - were made in West and Central Europe. Cannabis resin seized in Europe continued to originate mainly from Morocco. Spain accounted for 50% of global resin seizures, and for 77% of seizures in the West and Central Europe subregion. In 2007, resin seizures in Spain increased by 42% compared to the previous year, and in Morocco, the increase was 33%. Despite an increase in cannabis resin seizures in Europe, the amounts seized in 2006 and 2007 were still lower than those reported in 2003 and 2004.

Morocco accounted for most cannabis seizures made in Africa (118 mt), followed by Algeria (17 mt) and Egypt (6 mt), both of which also reported higher seizures than in 2006. While most cannabis resin produced in Morocco is destined for Europe, trafficking also takes place to or via North African and sub-Saharan countries.

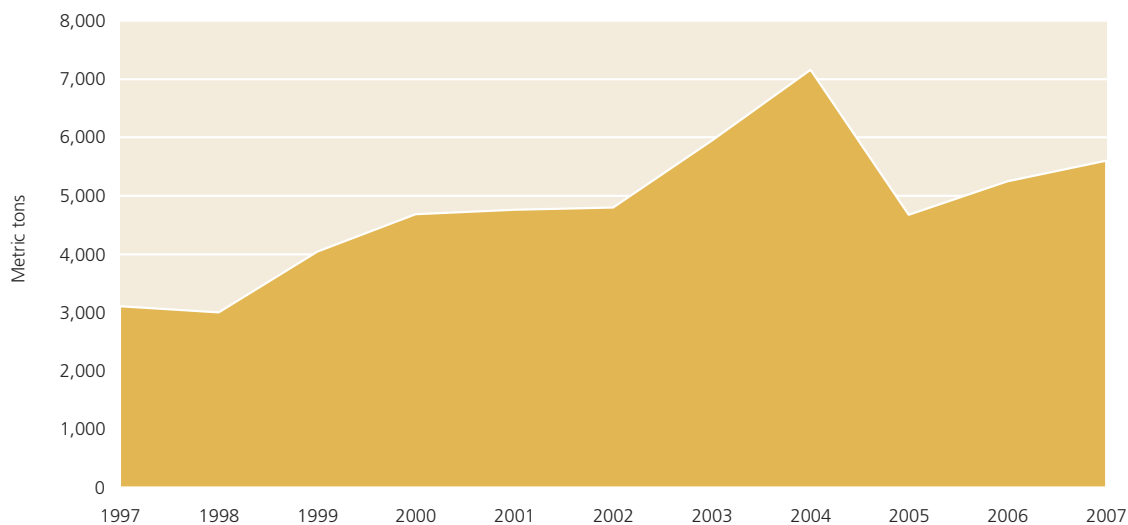
In 2007, as in the year before, South West Asia reported the second highest cannabis seizures worldwide, representing 22% of the global total. Most seizures in the region were made by Pakistan (8% of global seizures or 110 mt), followed by Iran (Islamic Republic of) (7% or 90 mt) and Afghanistan (6% or 84 mt). Cannabis resin seizures more than doubled in Iran and Afghanistan, while they remained at about the same level in Pakistan. The strong increase in cannabis resin seizures in this subregion confirms its role as an important cannabis resin producer. A rapid assessment of cannabis conducted by UNODC in 2008 confirmed the existence of cannabis cultivation for resin production in most provinces in Afghanistan.

Most of the cannabis resin produced in the region is trafficked towards Europe. However, reports confirm that some cannabis resin originating in South-West Asia also reached other Asian as well as North American countries.

South Asia reported about 6 mt or 0.5% of global seizures in 2007. India (3.8 mt) and Nepal (2.1 mt) continued to report the majority of cannabis resin seizures made in the region. Both countries are considered to be cannabis resin producers.

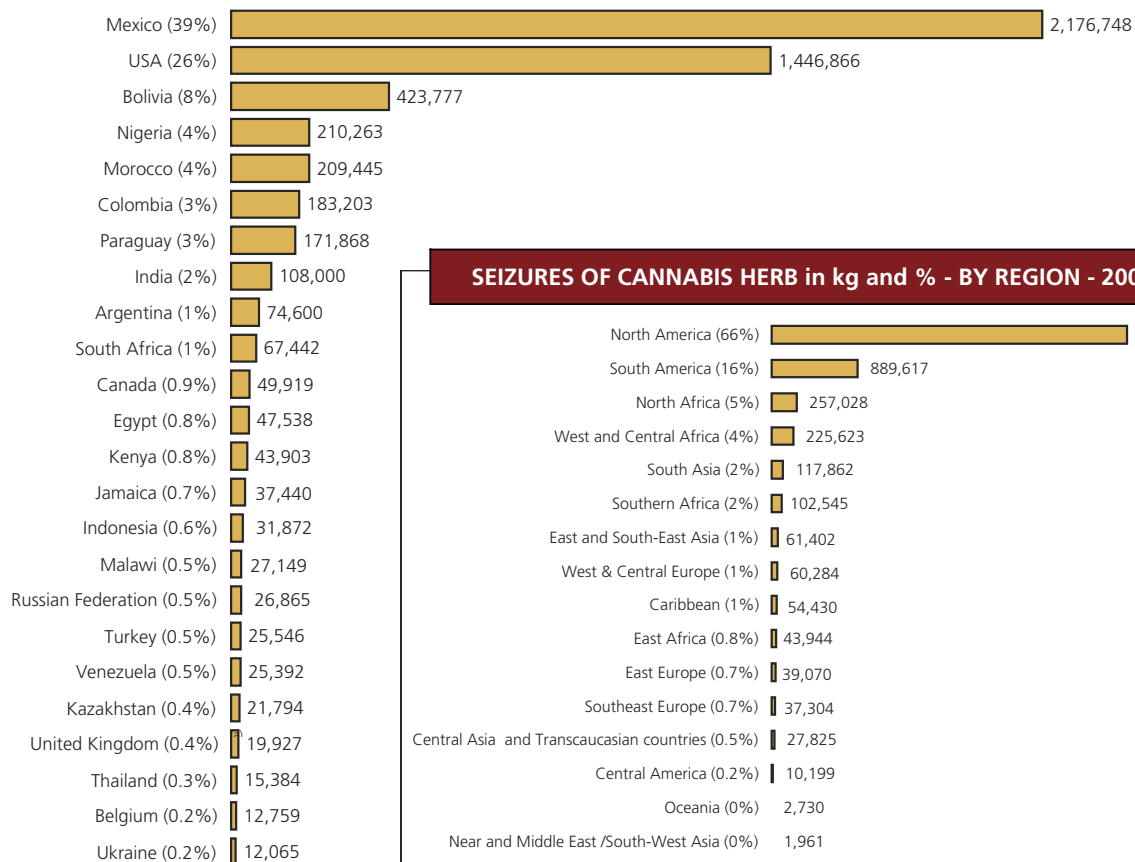
¹ Data refer to England and Wales only.

Fig. 56: Global seizures of cannabis herb, 1997-2007

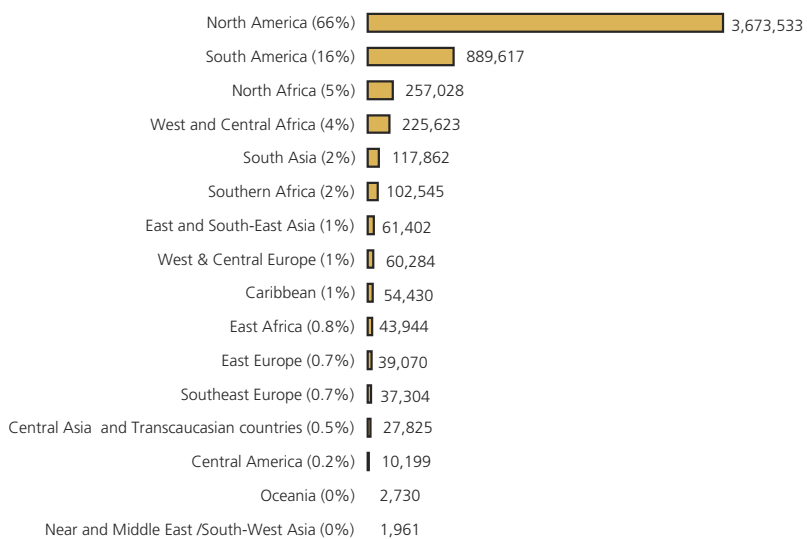


Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Metric tons	3,105	2,998	4,043	4,680	4,759	4,801	5,941	7,154	4,671	5,247	5,605

SEIZURES OF CANNABIS HERB in % of world total and kg- HIGHEST RANKING COUNTRIES - 2007



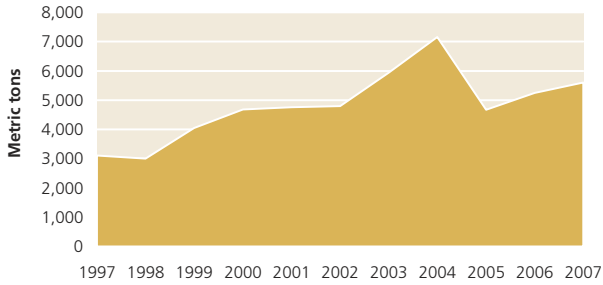
SEIZURES OF CANNABIS HERB in kg and % - BY REGION - 2007



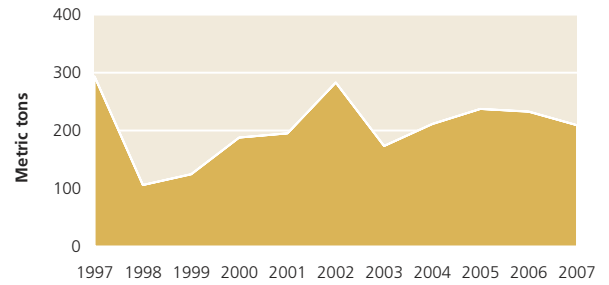
^(a) Data refer to England and Wales only.

Fig. 57: Global seizures of cannabis herb, 1997-2007

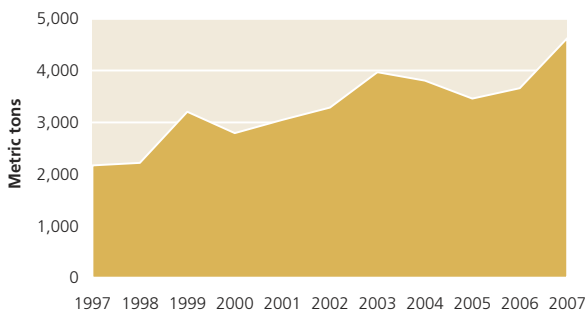
CANNABIS HERB INTERCEPTED - WORLD: 1997 - 2007



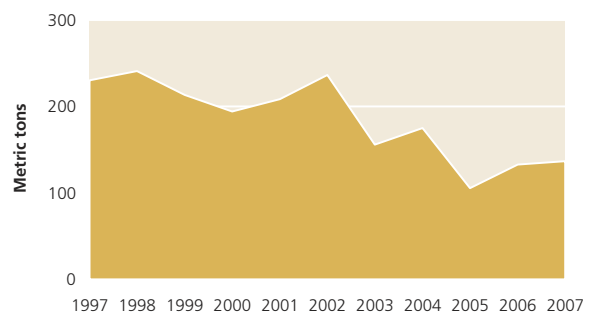
CANNABIS HERB INTERCEPTED - ASIA: 1997 - 2007



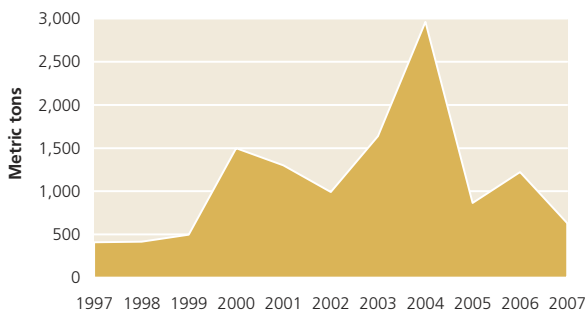
CANNABIS HERB INTERCEPTED - AMERICAS: 1997 - 2007



CANNABIS HERB INTERCEPTED - EUROPE: 1997 - 2007



CANNABIS HERB INTERCEPTED - AFRICA: 1997 - 2007



CANNABIS HERB INTERCEPTED - OCEANIA: 1997 - 2007

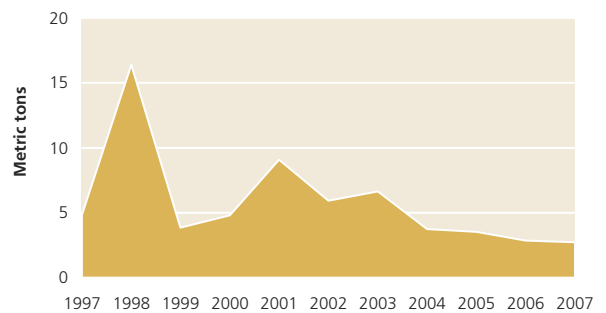
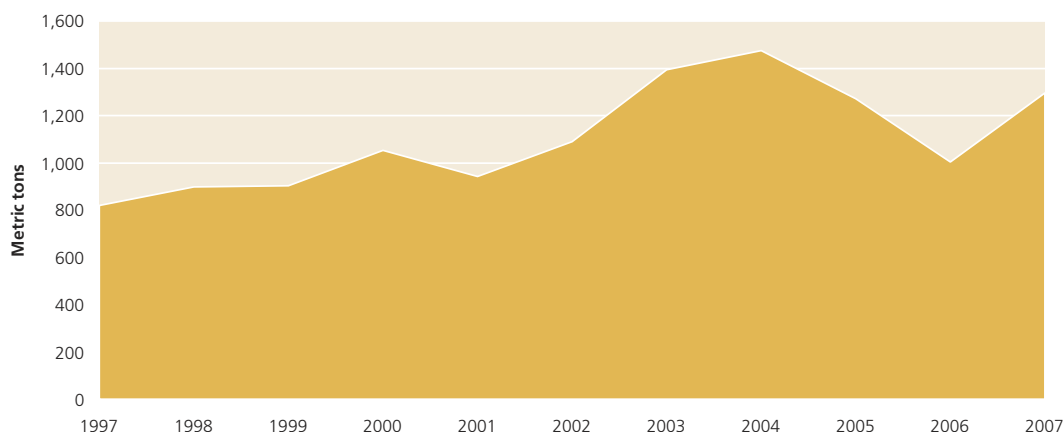
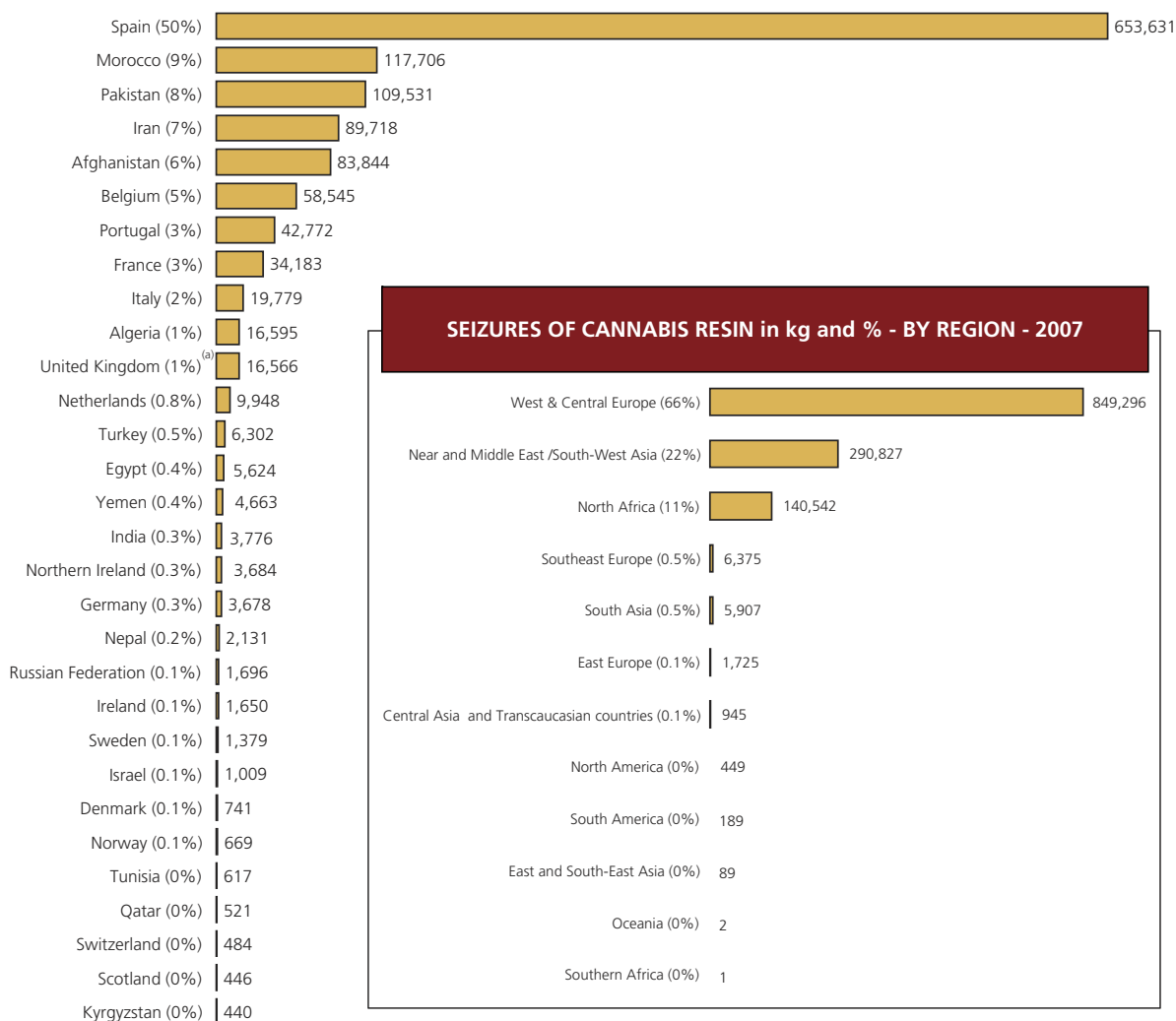


Fig. 58: Global seizures of cannabis resin, 1997-2007

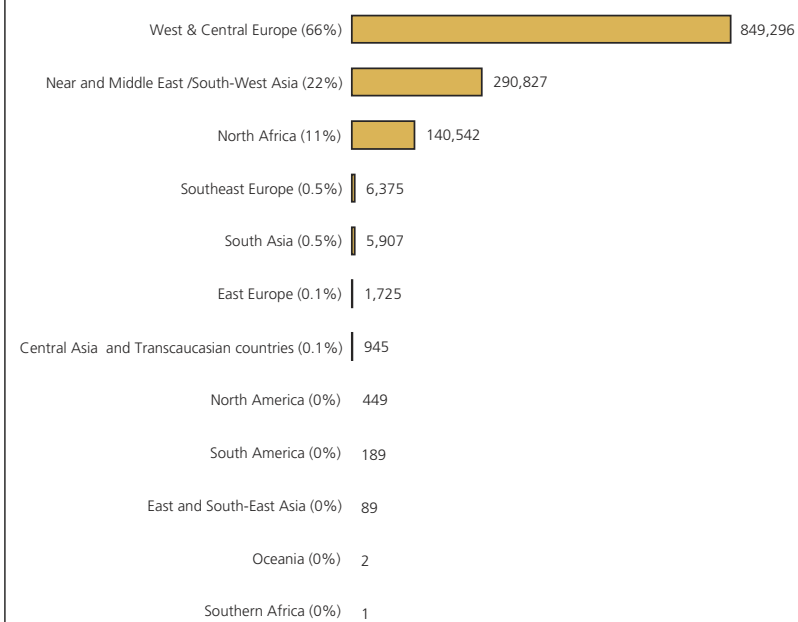


Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Metric tons	819	899	902	1,052	943	1,090	1,394	1,474	1,272	1,003	1,296

SEIZURES OF CANNABIS RESIN in % of world total and kg- HIGHEST RANKING COUNTRIES - 2007



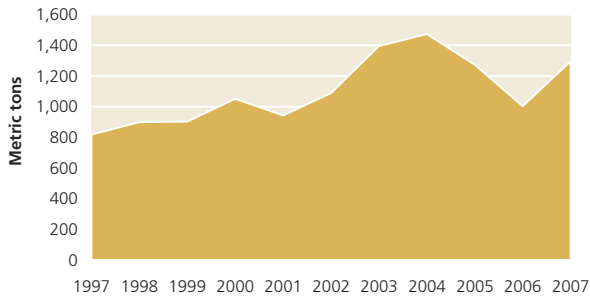
SEIZURES OF CANNABIS RESIN in kg and % - BY REGION - 2007



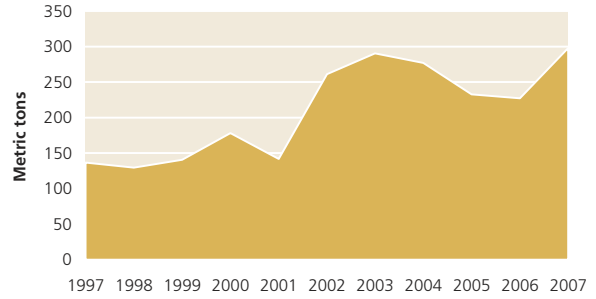
^(a) Data refer to England and Wales only.

Fig. 59: Global seizures of cannabis resin, 1997-2007

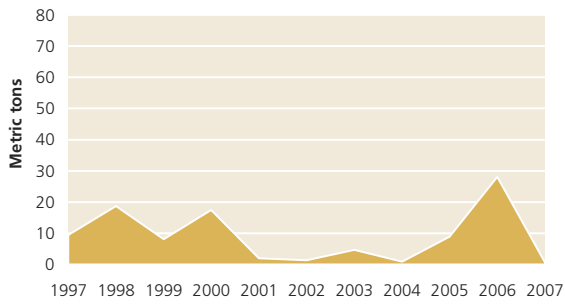
CANNABIS RESIN INTERCEPTED - WORLD: 1997 - 2007



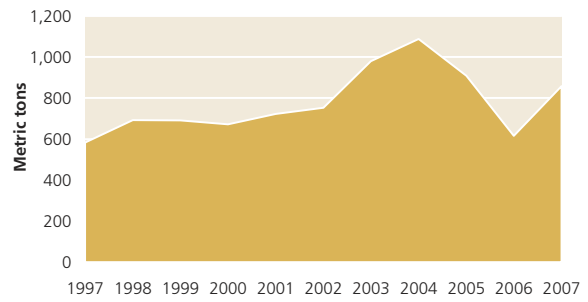
CANNABIS RESIN INTERCEPTED - ASIA: 1997 - 2007



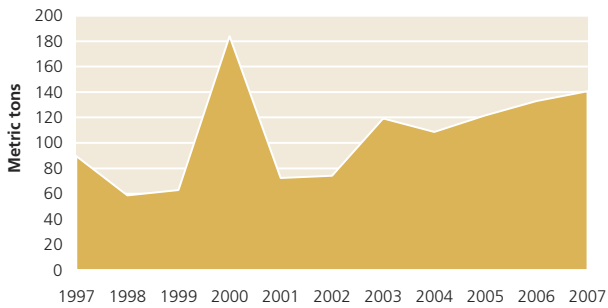
CANNABIS RESIN INTERCEPTED - AMERICAS: 1997 - 2007



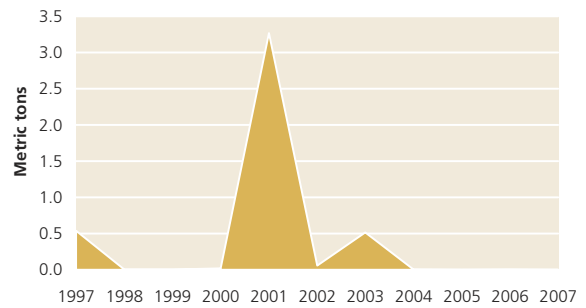
CANNABIS RESIN INTERCEPTED - EUROPE: 1997 - 2007



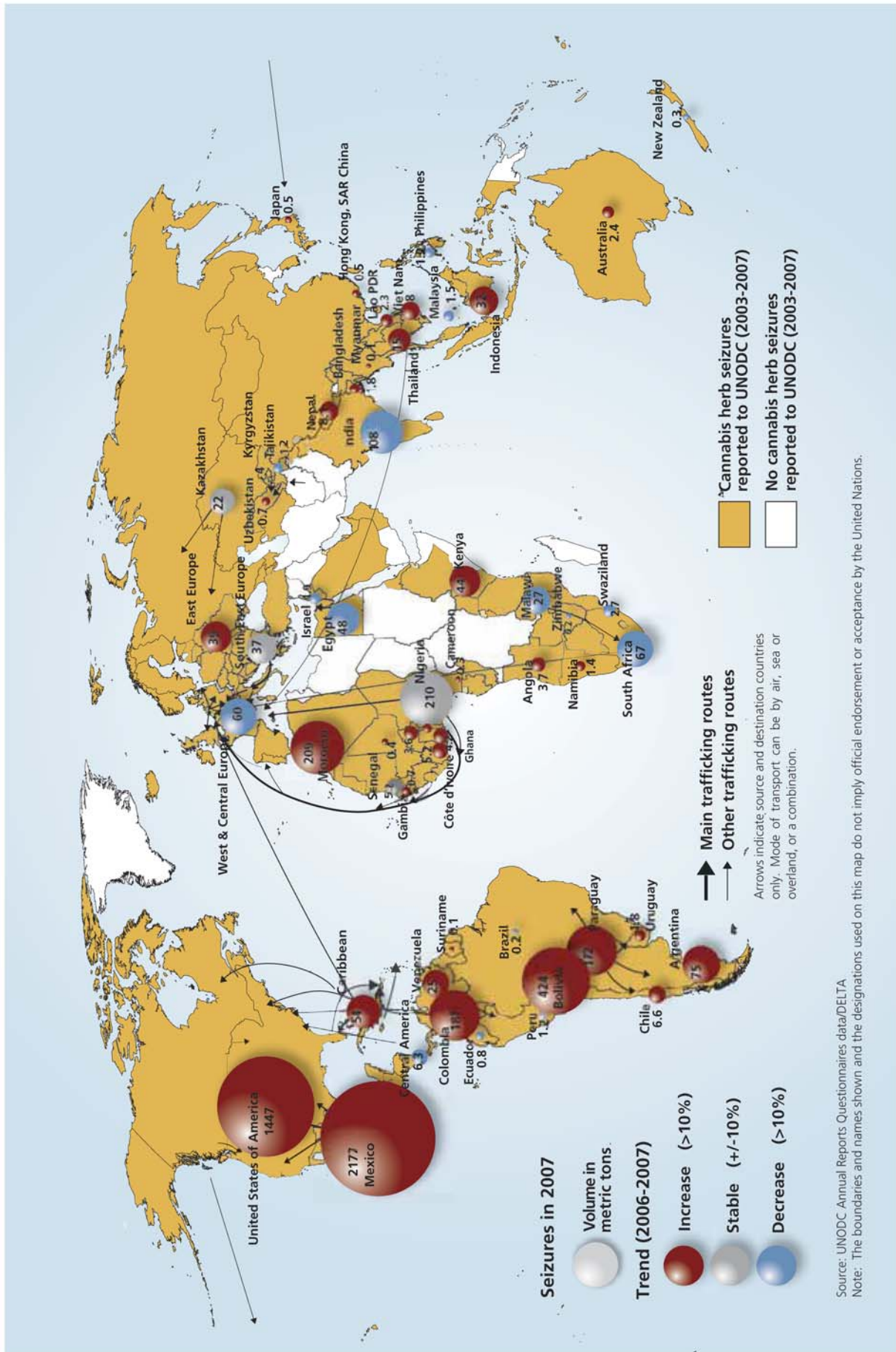
CANNABIS RESIN INTERCEPTED - AFRICA: 1997 - 2007



CANNABIS RESIN INTERCEPTED - OCEANIA: 1997 - 2007

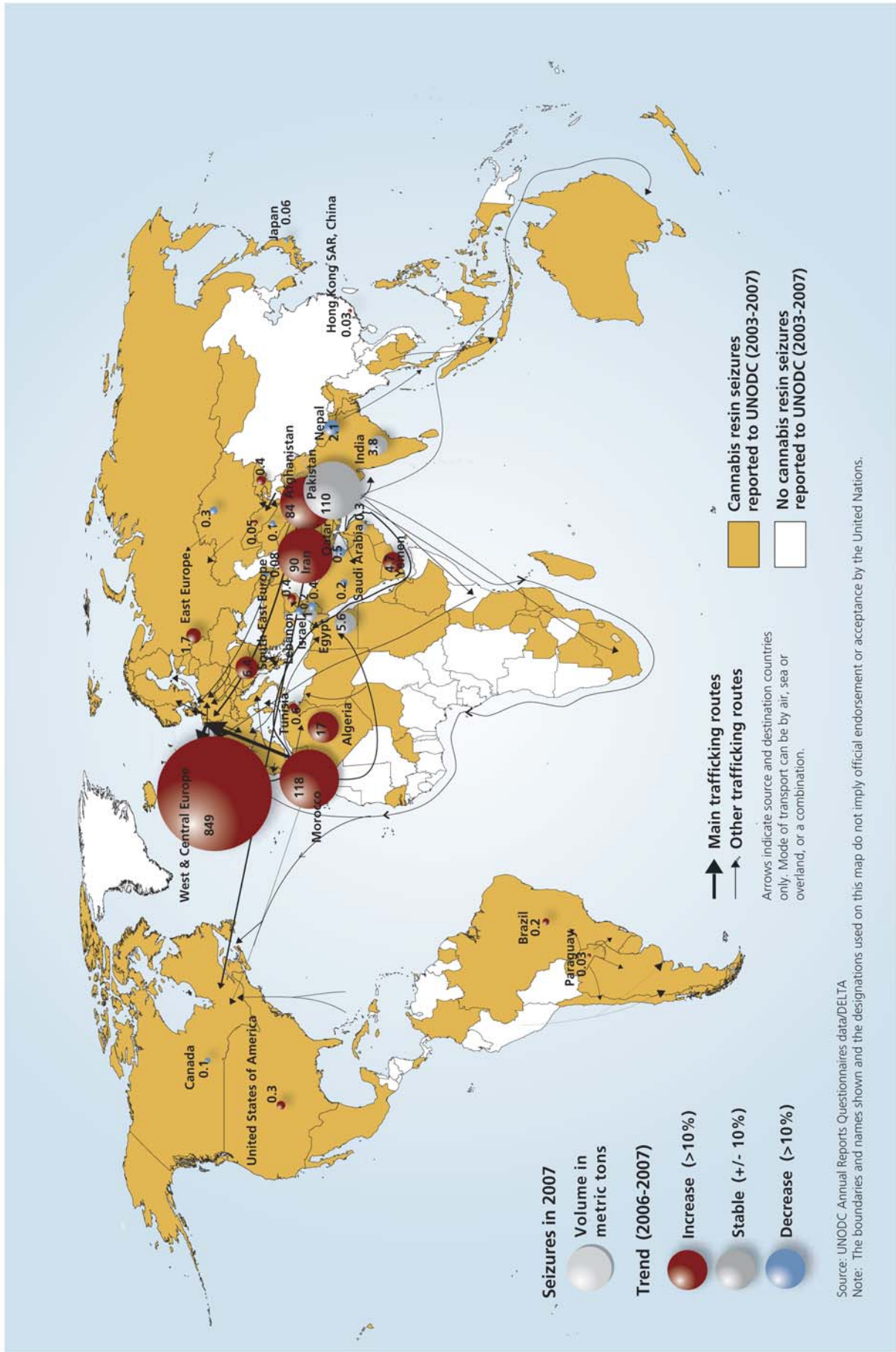


Map 14: Trafficking in cannabis herb, 2007 (countries reporting seizures of more than 100 kg)



Source: UNODC Annual Reports Questionnaires data/DELTA
 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 15: Trafficking in cannabis resin, 2007 (countries reporting seizures of more than 10 kg)



1.3.4 Consumption

The global number of cannabis users is estimated to range from some 142.6-190.3 million persons, equivalent to a range from 3.3 to 4.4% of the population aged 15-64 who used cannabis at least once in 2007.

This year, significant revisions were made to the approach taken in making global and regional estimates of the number of people who use drugs. The new estimates reflect the uncertainties surrounding these data (which exist due to data gaps and quality) and are presented in ranges rather than absolute numbers. Because of this revision, previous point estimates are not comparable to the current ones.

Table 19: Estimated number of people who used cannabis at least once in the past year and proportion of population aged 15-64, by region, 2007

Region/subregion	Estimated number of users annually (lower)	Estimated number of users annually (upper)	As percent of population aged 15-64 (lower)	As percent of population aged 15-64 (upper)
Africa	28,850,000	56,390,000	5.4	10.5
North Africa	3,670,000	9,320,000	3.0	7.6
West and Central Africa	16,110,000	27,080,000	9.3	15.6
Eastern Africa	4,490,000	9,030,000	3.4	6.9
Southern Africa	4,570,000	10,950,000	4.3	10.2
Americas	41,450,000	42,080,000	7.0	7.1
North America	31,260,000	31,260,000	10.5	10.5
Central America	580,000	580,000	2.4	2.4
The Caribbean	1,110,000	1,730,000	4.3	6.7
South America	8,500,000	8,510,000	3.4	3.4
Asia	40,930,000	59,570,000	1.6	2.3
East/South-East Asia	4,110,000	19,860,000	0.3	1.3
South Asia	27,490,000	27,490,000	3.2	3.2
Central Asia	1,890,000	2,020,000	3.8	4.1
Near and Middle East	7,440,000	10,200,000	3.1	4.3
Europe	28,890,000	29,660,000	5.2	5.4
Western/Central Europe	20,810,000	20,940,000	7.7	7.7
East/South-East Europe	8,080,000	8,720,000	2.9	3.1
Oceania	2,460,000	2,570,000	11.0	11.5
Global	142,580,000	190,270,000	3.3	4.4

Estimates of cannabis use for the People’s Republic of China

A number of indirect indicators, including seizures, arrest data and treatment data, suggest that cannabis use in the People’s Republic of China is significantly lower than in other East and South-East Asian countries. China has so far, however, not undertaken any national household survey of illicit drug use. No national estimate of cannabis use exists.

One World Health Organization (WHO) school survey, conducted in 2003 in four cities, assessed drug use. It found lifetime prevalence rates of drug use among 13-15 year old pupils ranging from 0.9% in Beijing to 2.5% in Hangzhou (eastern China). The unweighted average of the four cities was 1.75%.

In comparison, the lifetime prevalence of drug use among 13-15 year old pupils in Thailand in 2008 was 6.1%. A 2007 Thai household survey found an annual prevalence of cannabis use of 1.2% among the general population (aged 12-65). In the Philippines, data from a 2003 WHO school survey among 13-15 year old students (life-time prevalence of 6.7%) was similarly far higher than a recent household survey estimate (annual prevalence of around 0.8% in 2008).

In the regional estimate calculated for cannabis use, all countries with no national data available, including China, were assigned the range from other countries in the region. This means that there was a wide range applied from existing national prevalence estimates, namely from 0.23% to 1.34%

UNODC has not applied the school data estimate for China to make an estimate for 15-64 year olds across the country, because it was based on only four cities that do not necessarily reflect the national picture of cannabis use. This means that the regional and global range of estimated cannabis users is very large, because of the sheer size of China’s population. However, using such an estimate would reduce the range of uncertainty in the estimates for Asia by 25%. This highlights the great importance that estimates of the level of drug use in the world’s populous countries (and in this case, their absence) has upon our confidence in global figures.

Use stabilizing or declining in North America

Cannabis use declined in North America over the last decade. In 2007/08 it seems to have stabilized at the lower levels.

Drug tests, which are regularly conducted among the US workforce, found a decline in the proportion of positive cannabis tests among the general US workforce from 3.4% in 1997 to 2.3% in 2007, equivalent to a decline of 31% over the last decade. The figures suggest that the USA may be heading towards a stabilization of cannabis use at around 2%. In 2008 2.1% of the workforce tested positiv for cannabis.

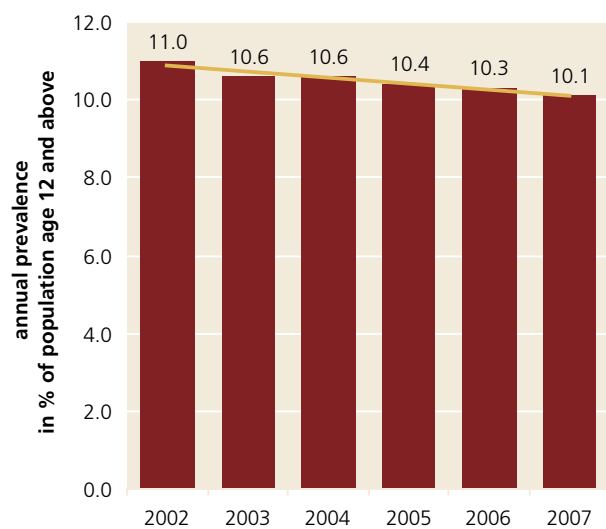
The decrease can also be observed in the total population using household data. Over the 2002-2007 period the annual prevalence of cannabis use declined gradually, from 11% of the population aged 12 and above in 2002 to 10.1% in 2007.

The last national Canadian Addiction Survey (CAS), conducted in 2004, found a prevalence rate of 14.1% among the population aged 15 and above¹ - thus exceeding the prevalence of cannabis use in the USA. The highest levels of cannabis use were reported in the

1 Health Canada, *Canadian Addiction Survey (CAS), Detailed Report*, March 2005.

Fig. 60: USA: annual prevalence of cannabis use, 2002-2007

Source: SAMHSA, *Results from the 2007 National Survey on Drug Use and Health, National findings*, Rockville, Maryland, 2008.



province of British Columbia, located at the Pacific coast (16.8%). Though data show that the differences across provinces in Canada or across states in the USA are not negligible, it should be pointed out that the

differences are far less pronounced than, for instance, across countries in Europe or South America.

A significant decline in cannabis use over the last few years was found among high school students in North America. Cannabis use among 8th-12th graders in the USA fell by 21% between 1998 and 2008. A decline in cannabis use over the last decade was also reported among high-school students in the province of Ontario, Canada.

Increases reported in Latin America

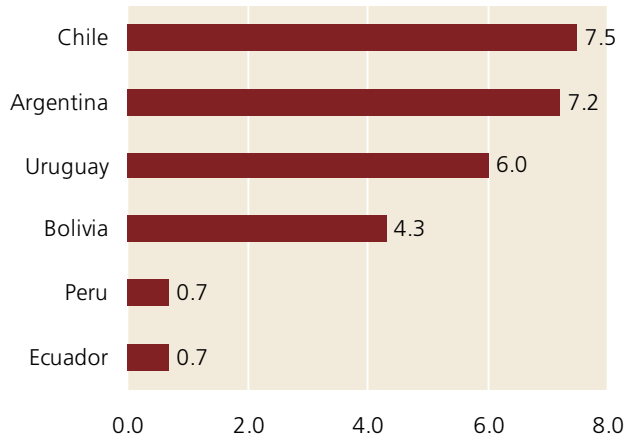
In contrast to the declining trend in North America, increases in cannabis use have been reported in countries in Latin America and the Caribbean in recent years, notably in 2007. Eleven countries reported rising levels of cannabis use in 2007, up from seven in 2005. Seven countries saw a stable trend, but not a single country reported a decline in 2007. The increase across the region was also identified by the Latin American Epidemiological Network (REDLA).²

Despite the increasing trend, cannabis use levels are still significantly lower in South America than in North America, as reflected in data collected in school surveys and household surveys.

Comparative household surveys among the general population were conducted in six South American states in 2006/07 by UNODC and the Inter-American Drug Abuse Control Commission (CICAD). These identified the highest levels of cannabis use in Chile, followed by Argentina and Uruguay. Far lower levels were reported in Peru and Ecuador.

Fig. 61: Cannabis use in selected South American countries in 2006/07*

Source: UNODC and CICAD, *Elementos orientadores par alas Políticas Públicas sobre Drogas en la Subregión*, Lima 2008.



*Sampled populations vary slightly. Figures not directly comparable.

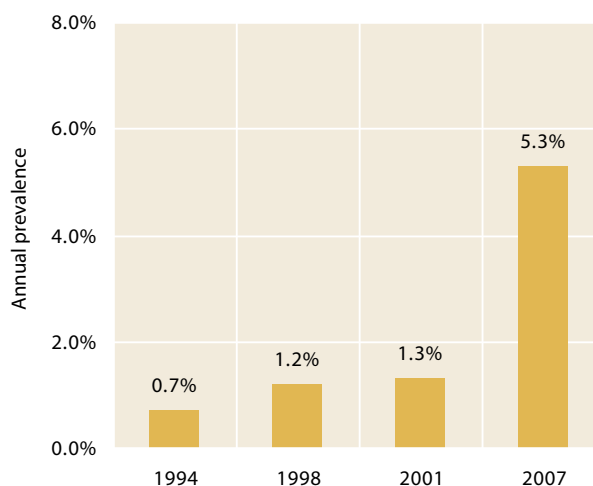
2 CICAD Observer, "REDLA Network Identified Worrying Trends in Drug Use across Latin America", June 2008, http://www.cicad.oas.org/oid/NEW/Information/Observer/08_01/REDLA.asp

increase in the annual prevalence rate from 3.7% in 1999 to 6.9% in 2006, among the population aged 12-65. Moreover, studies among high school students in Argentina (aged 13-17) showed an increase in the annual prevalence rate of cannabis use from 3.5% in 2001 to 8.1% in 2007.

A clear upward trend is also reflected in data from neighbouring Uruguay. Following moderate use rates in the 1990s, the annual prevalence of cannabis use rose quadrupled, from 1.3% among the population aged 15-65 in 2001 to 5.3% in 2007.

Fig. 62: Uruguay: annual prevalence of cannabis use among the population aged 15-65, 1994-2007

Sources: Observatorio Uruguay de Drogas (OUD), *Encuesta Nacional en Hogares sobre Consumo de Drogas 2007* and Secretaría Nacional de Drogas y Junta Nacional de Drogas, *Encuesta Nacional de Prevalencia del Consumo de Drogas 2001*.



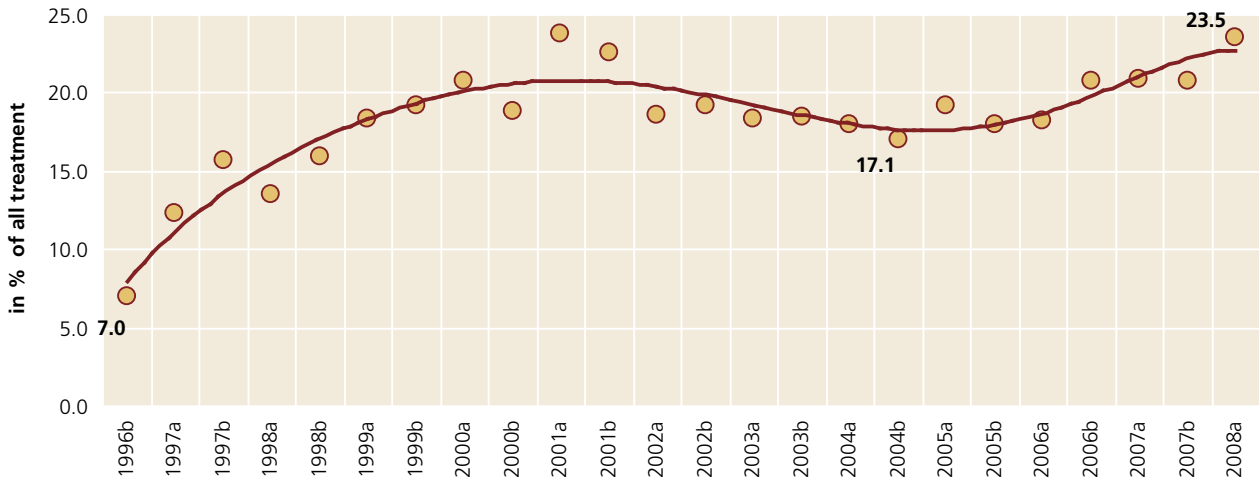
An increase in cannabis use was also reported in Brazil, the largest country in South America. The annual prevalence of cannabis use more than doubled, from 1% in 2001 to 2.6% in 2005³ and – according to the Brazilian authorities it appears to have continued rising in subsequent years.

Strong increases in cannabis use were also reported in Chile. The annual prevalence of cannabis use rose from 3.7% in 1994 to 7.5% in 2006.

3 CEBRID, *II Levantamento Domiciliar sobre o Uso de Drogas Psicotrópicas no Brasil: Estudo Envolvendo as 108 Maiores Cidades do País*, Sao Paulo 2006 and CEBRID, *II Levantamento Domiciliar sobre o Uso de Drogas Psicotrópicas no Brasil: Estudo Envolvendo as 107 Maiores Cidades do País*, Sao Paulo 2002.

Fig. 63: South Africa: cannabis as primary drug of abuse in treatment demand*, 1996-2008

* unweighted average of treatment (incl. alcohol) in 7 provinces.
 Source: SACENDU, "Monitoring Alcohol & Drug Abuse Trends in South Africa, July 1996 – June 2008", *Research Brief*, Vol. 11 (2), 2008.



Cannabis use is increasing in Africa

From a total of 21 African countries reporting cannabis use trends for 2007, 7 countries saw use levels rising and 4 countries reported a decline. The rest were stable. These data suggest that overall cannabis use continued to rise in Africa in 2007. The increase, however, may be losing momentum. While 7 African countries saw an increase in cannabis use in 2007, the comparable numbers were 12 in 2006 and 18 in 2004.

The only systematic monitoring of drug use in Africa is taking place in South Africa, based on treatment demand. Data for South Africa suggest that treatment demand for cannabis use increased over the first two quarters of 2008. Including alcohol, cannabis accounted for 23.5% of substance abuse-related treatment demand in South Africa during this period.

In many European countries, use is stabilizing or declining

In contrast, cannabis use in Europe has stabilized or shown a downward trend in a number of countries. Increased prevention efforts and the spread of knowledge on the health risks, partly related to the emergence of high-potency cannabis, seems to have contributed to the stabilization or downward trend. Some of the stabilization/decline may be linked to decreases of cannabis resin production in Morocco, Europe’s main source country of hashish, though such supply reductions seem to have been partly offset by rising levels of cannabis herb production within Europe.

In the UK, which used to be Europe’s largest cannabis market, a clear downward trend has been observed in recent years. In England and Wales cannabis use fell from a prevalence rate of 10.9% among the population

aged 16-59 in 2002/03 to 7.4% in 2007/08. The decline among youth started several years before the decline among the general population. In fact, annual prevalence of cannabis use among people aged 16-24 fell from 28.2% in 1998 to 17.9% in 2007/08, a decline of 37% over the last decade. The overall prevalence estimate for the United Kingdom as a whole would be around 8.1%, equivalent to some 3.2 million persons.

In Spain, an important cannabis market due to its strategic location close to the main cannabis resin production centers of Morocco, household survey data showed a moderate decline, from a peak of 11.3% of the population aged 15-64 in 2003 to 10.1% in 2007. Data suggest that the strong upward trend over the 1993-2003 period has thus started being reversed. The total number of cannabis users in Spain is now estimated at around 3 million persons.

Fig. 64: Spain: annual prevalence of cannabis use among the population aged 15-64

Source: Delegación del Gobierno para el Plan Nacional Sobre Drogas, "Informe de la Encuesta Domiciliaria sobre Alcohol y Drogas en España (Edades) 2007/08", October 2008.

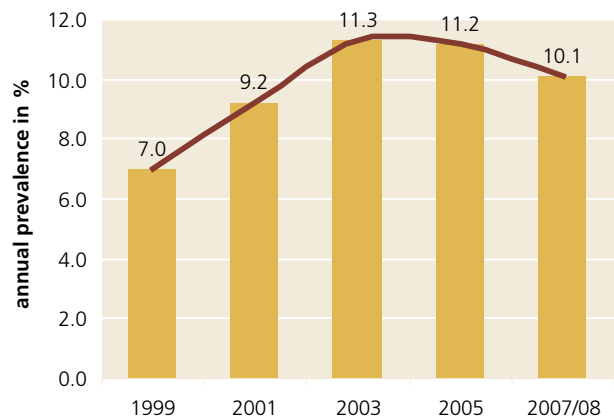
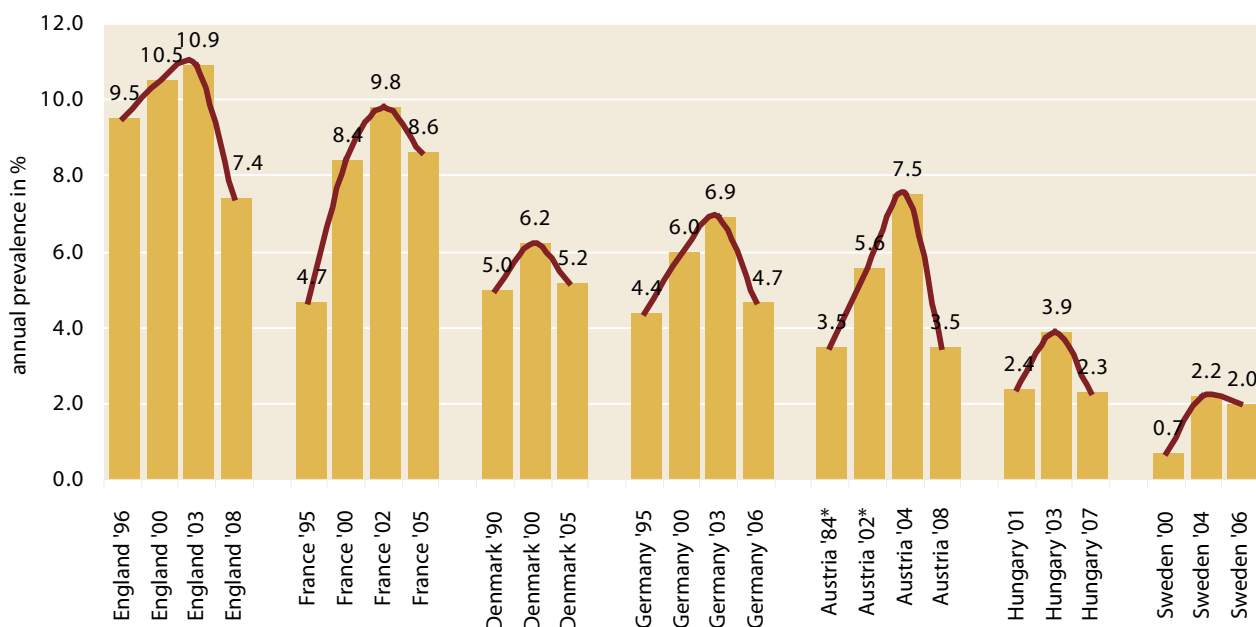


Fig. 65: England & Wales, France, Denmark, Germany, Austria, Hungary and Sweden: annual prevalence of cannabis use in % of the young and adult population^a

^a England and Wales in % of population aged 16-59; France: in % of population aged 15-64; Germany: in % of population aged 18-59, 1995-2003; in % of population aged 18-64 in 2006; Denmark: in % of population aged 16+ in 1990 and in % of population aged 16-64 in 2005; Austria: in % of population 15-65. * UNODC estimate for Austria for 1984 extrapolated from results of a national study in 1984 among 15-40 year olds; UNODC estimate for 2002 based on several local studies conducted around 2002, reported in UNODC's 2004 World Drug Report.

Sources: UNODC, Annual Reports Questionnaire data; EMCDDA, Statistical Bulletin; Ludwig Boltzmanninstitut, "Österreichweite Repräsentativerhebung zu Substanzgebrauch – Erhebung 2008" (Draft), Vienna 2009".



A similar trend of rising cannabis use in the 1990s followed by some decline in recent years can be also noticed in recent household surveys from a number of other European countries.

Cannabis use seems to have remained stable in the Netherlands, one of the key cannabis production and redistribution centres in Europe. Available household survey data, however, only reflect the situation over the first few years of the new millennium (5.5% in 2001 and 5.4% in 2005). Despite this stabilization, treatment demand related to cannabis abuse increased strongly between 2000 and 2005, possibly reflecting the emergence and spread of higher-potency cannabis on the market. The number of (outpatient) addiction care clients with primary cannabis problems rose by more than 75% between 2000 and 2005.⁴ The average THC content of domestically grown Dutch marijuana almost doubled, from 8.6% in 2000 to 16% in 2007.

Following increases in the 1990s, cannabis use levels also remained quite stable in some of the new Central European EU member states, including Poland (2.8% in 2002; 2.7% in 2006), the Czech Republic (10.9% in 2002; 9.3% in 2004) and Slovakia (7.2% in 2000; 6.9% in 2006).

⁴ Trimbos Instituut, *The Netherlands National Drug Monitor, Annual Report 2007*, Utrecht 2008.

... although use is increasing in some European countries

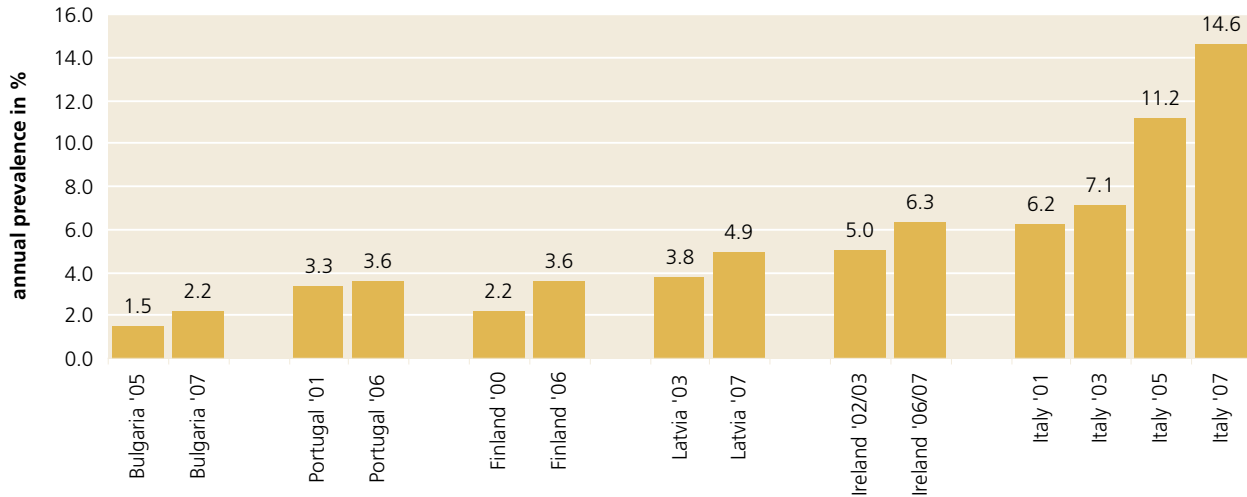
In contrast, cannabis use appears to have increased in some of the countries at the geographical fringes of Europe such as Ireland, Portugal, Bulgaria, Latvia and Finland. However, some of these increases were small and not statistically significant.

The situation is different for Italy, where the cannabis prevalence rates more than doubled in recent years (7.1% in 2003; 14.6% in 2007). Italy has evolved as Europe's single largest cannabis market, with some 5.7 million users in 2007, out of a total of about 30 million users in Europe. This reflected, inter alia, widespread availability of cannabis herb from Albania and the Netherlands, and rising domestic production in southern Italy. In contrast to many other European countries, the average cannabis potency has remained stable in Italy, fluctuating at around 6%, which is a low level by European standards. This may explain that the negative consequences of cannabis consumption, found in many other European countries, may have been less obvious in Italy.

Despite of the increases in cannabis use in Italy, overall cannabis use in Europe remained basically stable.

Fig. 66: Bulgaria, Portugal, Finland, Latvia, Ireland and Italy: annual prevalence of cannabis use in % of the young and adult population^a

^a in % of population aged 15-64 for Bulgaria, Portugal, Finland, Latvia, Ireland; data for Italy refer to the age group 15-44 in 2001; 15-54 in 2003 and 15-64 in 2005 and 2007.
Sources: UNODC, Annual Reports Questionnaire data, EMCDDA, Statistical Bulletin, Presidenza del Consiglio dei Ministri, *Relazione sullo Stato delle Tossicodipendenze in Italia, Anno 2007*, Rome 2008.



Cannabis use declined in the Oceania region

The downward trend of cannabis use in the Oceania region continued. The annual prevalence rate of cannabis use in Australia fell by almost one fifth to 9.1% of the population aged 14 and above between 2004 and 2007. The decline was strongest among the 14-19-year-olds, falling by 28%, indicating that prevention activities in schools may have played a key role in lowering cannabis use.

Household survey data for New Zealand also showed a decline of cannabis use in recent years, though this was less pronounced than in Australia. The annual prevalence of cannabis use fell from 20.4% among the population aged 15-45 in 2003 to 17.9% in 2007, a decline of 12%.

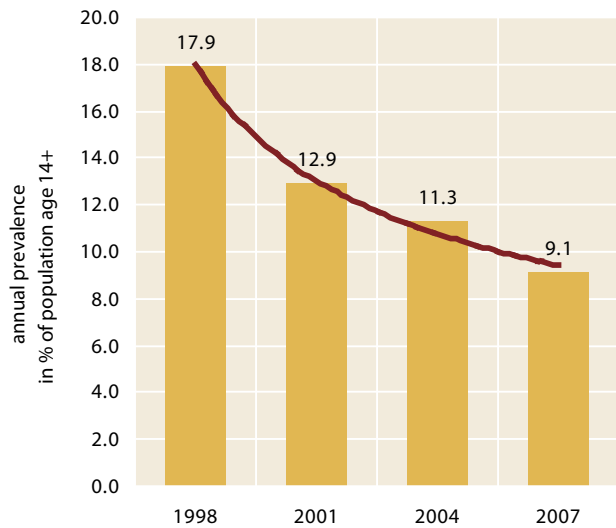
Cannabis use appears to be rising in Asia

According to expert opinion, expressed by the national drug authorities reporting to UNODC, cannabis use appears to be rising in Asia. However, most countries in this region do not have effective drug abuse monitoring systems which means that no recent cannabis prevalence data exist. Trends from Asia - largely based on expert perceptions - must thus be treated with caution.

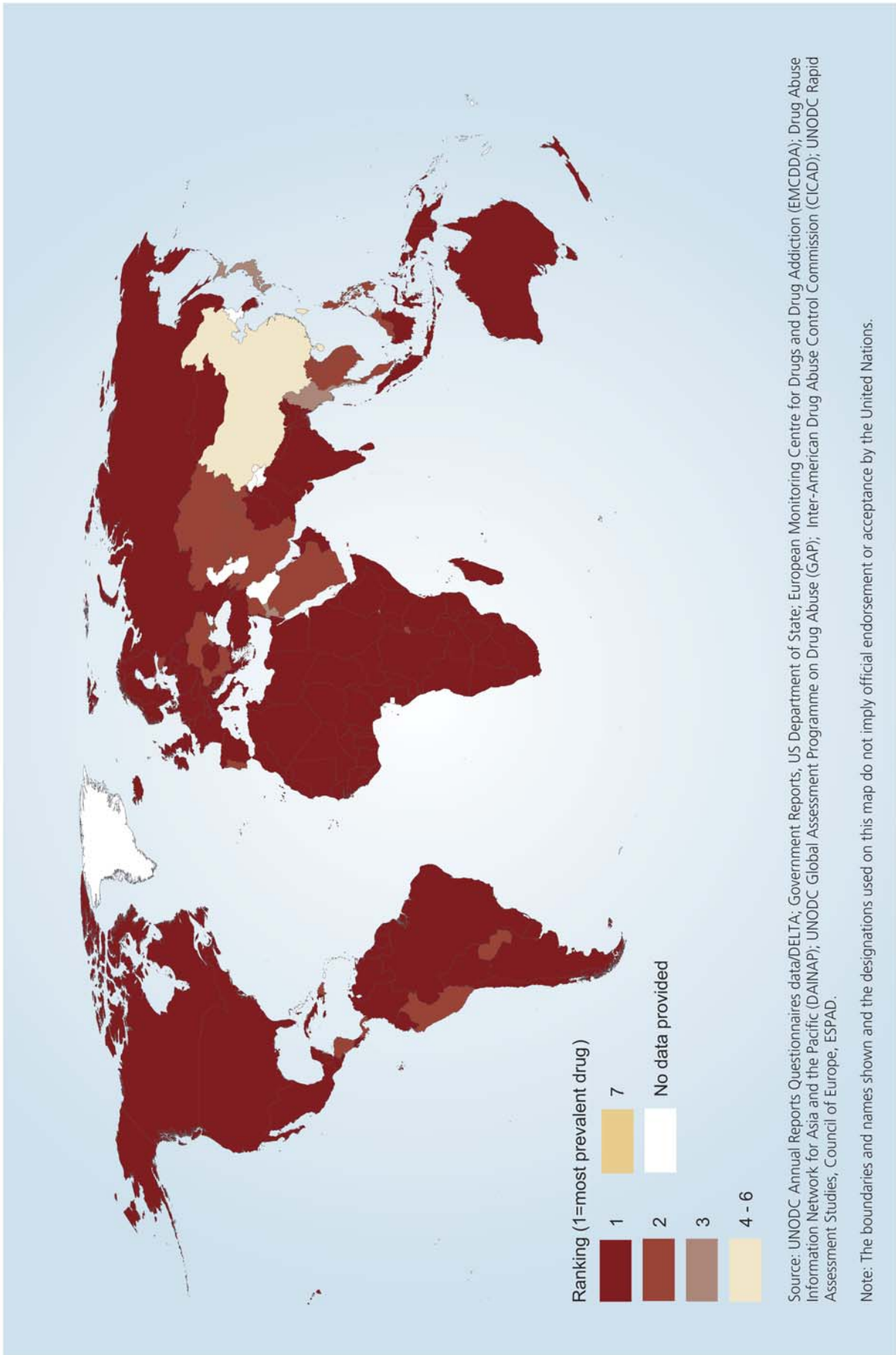
The number of Asian countries reporting an increase in cannabis consumption rose from 9 in 2005 to 13 in 2007. Increases in 2007 were reported by Azerbaijan, the People's Republic of China, Indonesia, the Islamic Republic of Iran, Kazakhstan, Lebanon, Mongolia, Myanmar, Oman, the Philippines, Sri Lanka, Tajikistan and Uzbekistan. Six countries/territories reported a decline, whereas 11 reported stable levels of cannabis use in 2007.

Fig. 67: Australia: annual prevalence of cannabis use among the population aged 14 and above, 1998-2007

Source: Australian Institute of Health and Welfare, 2007 *National Drug Strategy Household Survey, April 2008*.



Map 16: Ranking of cannabis in order of prevalence in 2007 (or latest year available)



Map 17: Changes in the use of cannabis, 2008 (or latest year available)

