

Annex 3 - Estimating individual consumption

Light tokers and chain-smokers

The estimated 162 million people who use cannabis do not all use it at the same rate. Some of them may have experimented with the drug once or twice, while others consume the drug on a daily basis. It is estimated that 10 per cent of people who try cannabis will progress to daily use for some period of their lives, with a further 20 per cent to 30 per cent using on a weekly basis.²⁶³ This leaves, however, a large share of people whose use is less frequent. The prevalence of use tends to vary depending on the life-stage of the user. For example, about 60 per cent of French 19-year-old boys have tried cannabis, and, of these, more than one in three uses 20 times a month or more. This share drops greatly in later life stages.²⁶⁴

Understanding global cannabis demand requires the creation of a typology of users, and the obvious source for the data on which to base this typology is household and school survey data. Unfortunately, while the number of 'last-month' users is often a feature of the standard surveys, more precise questions about the number of days the drug was used are often lacking.

In the United States, the National Survey on Drug Use and Health (NSDUH) has been conducted regularly since 1972. According to NSDUH data, of the 25 million US citizens over 12 who used cannabis in 2003, 14.5 million of them said they had used it in the past month, or about 58 per cent. This is almost exactly what

has been found in Australia, where 60 per cent of annual users consumed the drug in the last month.²⁶⁵ A similar share is seen in the Netherlands (61 per cent), with slightly lower levels seen in France (52 per cent), Greece (53 per cent), Ireland (51 per cent), and Latvia (47 per cent).²⁶⁶ A slightly higher level is seen in the United Kingdom (63 per cent).²⁶⁷

For a small share of these respondents, their use in the past month may have been the only time the drug was used in the past year. In other words, use in the past month does not mean that the drug was used every month of the previous year: 'past month use' does not mean 'monthly use'. This would suggest that the share of annual users that are also monthly users would be slightly lower than the figures discussed above. On the other hand, some heavier users might, for whatever reason, have missed out in the previous month. Data from the United States (discussed below) shows that 68 per cent of the annual respondents said they used the drug 12 or more times (i.e. on average, once a month). In Australia, National Drug Strategy Household Surveys have been held regularly since 1998. According to the 2001 data, 16 per cent of annual users over 14 consumed the drug every day, 23 per cent once a week or more, 12 per cent about once a month, and 49 per cent less often.²⁶⁸ Thus it would appear, if anything, that the number of those who say they used in the last month may be slightly less than the number that used 'monthly' (12 or more times in the past year.). For the purposes of this discussion, 55 per cent of the annual users will be

Table 4: Breakdown of European cannabis users by frequency of use

Country	Year	Annual Prevalence	per cent used in 30 days	1 to 3 days	4 to 9 days	10 to 19 days	20+ days
France	2000	8.4	4.4	42.5	15.5	15.5	26.4
Greece	1998	4.4	2.3	37.7	27.3	15.6	19.5
Ireland	2002/03	5.1	2.6	40.9	22.3	14.3	22.5
Italy	2001	6.2	4.7	38	30.4	12.3	19.3
Latvia	2003	3.8	1.8	57.1	24.2	13.3	5.4
Netherlands	2000/01	6.1	3.7	41.5	21.1	13.8	23.6
Portugal	2001	3.3	3.3	33.7	23.8	19.2	23.2
Spain	2001	9.7	6.8	29.5	24.8	12.1	33.6

Source: EMCDDA, Statistical Bulletin 2004.

designated ‘regular’ (about once a month or more) and 45 per cent ‘casual’ (less than 12 times in the previous year).

Comparing the US and Australian figures shows a different breakdown in levels of use between the two areas. Only a third (32 per cent) of US users said they consumed the drug less than once a month, whereas nearly half (49 per cent) of the Australian users fall in this category. On the other hand, 16 per cent of the Australian users were daily consumers, compared to just 7 per cent of the US respondents. Taken at face value, Australian users seem to be taken to the extremes, with US users more likely to fall somewhere in the middle. If the categories were softened a bit, however, the fit is better. For example, if ‘daily’ use is considered five times or more per week, 18 per cent of the US respondents qualify, close to the Australian 16 per cent. New Zealand uses a softer standard for ‘heavy’ use: 10 or more times in the past month, but 20 per cent of the annual users fall into this category.²⁶⁹

Statistics from European household surveys as compiled by the European Monitoring Centre for Drugs and Drug Addiction show rates of cannabis use among those who used in the past 30 days. These figures show that between 1 per cent (Finland) and 7 per cent (Spain) of those who had used cannabis also consumed the drug in the last 30 days. Among past month users, between 5 per cent (Latvia) and 34 per cent (Spain) consumed the drug more than 20 days out of the last 30, and are designated by EMCDDA as “daily or almost daily users”.

This figure would correspond to more than 240 days use in the past year, close to five times a week or more (260 days a year). Thus, we would expect the European figures for 20+ day last month users to be close to the

16 per cent to 18 per cent seen in Australia and the US, and, as the Table below shows, they are in several cases.

This analysis shows that survey data from a number of countries (the US, Australia, France, Greece, Ireland, Italy, and the Netherlands) indicate that past month users comprise about half of annual users, and that ‘daily or almost daily’ users comprise between 10 per cent and 20 per cent of the annual user pool, with a mean, median, and mode of 14 per cent.

Sources from a wide range of countries suggest that about 14 per cent of annual cannabis users are daily users, a higher figure than many would expect. If these figures could be generalized to the total global population, this suggests that about 22.5 million people use cannabis daily or near-daily, with the other 138.5 million using it less often. This figure is important because only at the level of daily or near-daily use does tolerance develop, and this has an impact on the amount of cannabis used.

How much cannabis in a dose?

Like all drugs, cannabis dosage is highly dependant on factors such as body weight, individual metabolism, and tolerance, and there is limited material on what constitutes a ‘dose’ among recreational users. There are two ways of approaching this problem, both of which are pursued below. One is to determine, on the basis of scientific testing, how much cannabis a user needs to consume to receive the desired effects. Due to the extreme variability in potency, however, cannabis dosages would need to be expressed in the amount of THC absorbed by the system, rather than the weight of the product consumed. The second approach would be to look at actual use patterns based on survey or other data.

Table 5: Ratios of annual to more frequent users

Country	Share of respondents users who are annual users	Share of respondents who are past month users	Share of annual users that are monthly users	Share of monthly users who are daily users	Share of annual users that are daily users
France	8.40%	4.40%	52%	26%	14%
Greece	4.40%	2.30%	53%	20%	11%
Ireland	5.10%	2.60%	51%	23%	12%
Italy	6.20%	4.70%	76%	19%	14%
Netherlands	6.10%	3.70%	61%	24%	15%

Source: Calculations based on EMCDDA data.

The question of what an 'average' user consumes is complicated by the issue of tolerance. While the extent of tolerance has not been precisely quantified, it appears to build within a few days of chronic use and dissipate just as fast.²⁷⁰ In other words, tolerance is not an issue for anyone but daily or near-daily users, but there are likely to be stark differences in the dosage levels, and consequently the consumption levels, between these two groups.

Determining dosage levels in a laboratory setting is complicated by a number of factors. For example, testing of blood THC levels of those known to have consumed a set quantity of cannabis demonstrates that smoking technique makes a considerable difference in the amount of THC absorbed. When smoked, only between 15 per cent and 50 per cent of the THC in a joint is absorbed into the blood stream, but experienced users are able to access about twice as much THC as casual users, due to superior inhalation technique.²⁷¹

Using this absorption range, smoking an average joint in the United States (0.5g of 10 per cent THC²⁷²) would result in the ingestion of 7.5mg to 25mg of THC. When smoked, the World Health Organization (WHO) says that only 2mg to 3mg are sufficient to produce the desired effect in most people.²⁷³ Using the WHO standards, this would mean consumption of perhaps 10 per cent to at most 40 per cent of an average joint in the United States should be sufficient to produce the desired effect. This represents a 'dose' level of between 0.05g and 0.2g.²⁷⁴ Of course, threshold levels are often exceeded,²⁷⁵ but these guidelines are meant to capture the experience of the average user.

In other words, one average joint represents enough cannabis to serve between two and ten people, according to WHO standards. This may be one reason why cannabis is frequently consumed in groups, or a joint is smoked in more than one consumption session. Higher quality cannabis would obviously require less of a joint to be smoked. Thus, however convenient the unit, a joint should not be considered a 'dose'. Consumption of an entire joint in a single setting by a casual user would be rare, rather like a casual drinker consuming an entire bottle of wine. Cannabis of reasonable potency is actually more like spirits: just a few 'shots' are enough to produce the desired level of inebriation.

As cannabis is usually consumed communally, with a single joint being passed around, there is almost no lower limit to the amount consumed by casual users. In other words, survey respondents who say they have con-

sumed cannabis in the last year (especially novice users) may have only had a toke or three on one or more occasions. The quantity consumed by these individuals in terms of the weight of the drug product is minimal.

This level of use is reflected in the New Zealand survey data, which is unique in asking users how much they consumed on each occasion they used the drug, and allowing for specification of amounts lower than one joint. In 2001, the average annual user reported smoking six-tenths of a joint. This average includes the 20 per cent of the annual users who were classed as 'heavy' smokers (using 10 or more times in the last month), so modal values for occasional users would be much less. The New Zealand surveys also ask about sharing joints, the results show that nearly all use takes place in groups of two or more. In 2001, only 4 per cent smoked alone during a 'typical' consumption session, while 14 per cent shared with one other, 29 per cent with two others, 24 per cent with three others, 17 per cent with four others, 6 per cent with five others, 3 per cent with six others, and 2 per cent with seven others. A large share (45 per cent in 2001) never bought the cannabis they consumed, and another significant part (26 per cent) received at least some of their cannabis for free.²⁷⁶ This is consistent with figures from France, the US, and Ireland.

While there is virtually no floor on the amount of cannabis that might have been used by an annual user, it also seems that the ceiling on use is very high. Unlike other drugs, it is impossible to die of an 'overdose' of cannabis. Experienced smokers can use the drug continuously if there are no social barriers to their use. Those who grow their own supply may also circumvent financial constraints. For these users, the only ceiling on their use is the time it takes to prepare and consume the drug.

Many daily users have rules around when and where they will consume, generally restraining their use to leisure time. Surveys of users in New Zealand show 95 per cent of annual smokers polled said they never used the substance at the workplace, so employment may form a major impediment to constant consumption.²⁷⁷ A study of users in Amsterdam, where the drug is widely tolerated, found that declining to consume at work was the single most commonly followed 'rule' around consumption, and that 27 per cent of their sample of experienced users adhered to this rule, while a further 20 per cent abstained from smoking during the day, and 15 per cent abstained during the morning.²⁷⁸ In France, just under a quarter (24 per cent) of 'heavy' (20 times a

month or more) users only ‘sometimes’ or ‘never’ consumed in the morning or afternoon.²⁷⁹ Thus, a reasonable division could be hypothesized between daily users who have a joint or two in the morning and/or evening and those whose lifestyles allowed them to be continuously intoxicated. These ‘chronic’ users need to be distinguished from other daily users, as amount of cannabis they consume is much greater.

One source of information on dose levels for heavy users is the literature on medical use of cannabis. There is a great deal of contradictory information on what constitutes a ‘normal’ use pattern among medical cannabis recipients. Using the prescription guidelines for synthetic THC as a guideline, users required to be constantly under the influence of cannabis would need to smoke the equivalent of between two and ten standard 0.5 g joints of good potency daily.²⁸⁰ Some reports have suggested higher amounts, however. One study of four long-term medical cannabis patients found consumption levels of between seven and nine grams a day, although this dosage was the product of years of constant use, and lower consumption levels had been adequate at earlier stages.²⁸¹

Unfortunately, the ability to generalize actual medical use patterns to the public at large is limited because medical users tend to have access to better quality cannabis than the general public.²⁸² It seems likely that heavy users without access to medical cannabis would use more potent product as well, and would be more likely to grow their own, but the extent to which this is true is unclear.

Another source of information on user habits is the regulated industry of the Dutch coffee shops. According to the Dutch Ministry of Health, Welfare, and Sports, the 600,000 users of cannabis products in the Netherlands consume an average of two grams per week per customer.²⁸³ Of course, this average consumption level obscures great variation in individual use levels, and, like medical cannabis, the quality of this product is likely to be much better than that available to users in other parts of the world.

Field accounts of use levels among non-medical regular users vary in quality, and the question of sampling is always an issue. The Independent Drug Monitoring Unit (IDMU) in the United Kingdom makes use of a sample of ‘regular’ users gathered at “pop-festivals and pro-cannabis rallies... subcultural magazines, snowballing, via direct mailings to pressure groups, and at other events.” This sample is clearly not representative

of annual cannabis users, but does give information on the upper end of the use scale.

The IDMU notes that even within this pool, the majority of the regular users consume relatively small amounts of the drug, with a mean consumption of 1 g per day. But among daily users, the average was over six joints a day, with some examples of much heavier use.²⁸⁴ Other research in the United Kingdom also suggests that daily users may consume as much as five joints a day.²⁸⁵ Informal interviews conducted in connection with this study with a number of employed daily users suggest a monthly consumption level of about 28g, enough cannabis for about two joints a day.²⁸⁶

One qualitative study of drug users in Milan found that while most users consume only occasionally, daily users smoke between two and five joints, or one to two grams of cannabis, a day. One dealer interviewed in connection with the study, however, claimed that at one point in his life he consumed up to 20 grams in a day.²⁸⁷ In Costa Rica, a study of 41 long term users found that 10 joints a day were smoked, but the total weight of the cannabis was only 2 g with an average THC level of 2.2 per cent.²⁸⁸ One study of long-term, regular²⁸⁹ users in Australia found a median use pattern of two ‘standard’ joints a day (50 per cent smoked between one and four joints a day), but there were some stark outliers. Overall, one-third smoked cannabis throughout the day, while the rest restricted themselves to evenings or other times.²⁹⁰ There are some studies that suggest much higher levels of use, but the credibility of these accounts has been questioned.²⁹¹