



Cannabis

Issues for policy makers

Acknowledgements

EURAD is a European network of around 50 non-governmental organisations which advocate for prevention and recovery oriented drug policies. Many of our affiliate organisations work directly in the field of drug prevention or as drug treatment and rehabilitation providers.

Our mission is to reduce the burden on individuals, families and society at large by promoting comprehensive, balanced and integrated policies. We seek to reduce demand for illicit drugs through evidence-based prevention and treatment.

We respect the fact that internationally there are important historic, cultural and social differences that impacts on how we talk about drugs and drug policy. We respect that people come into this policy field with very different backgrounds, motifs, experiences and perspectives.

EURADs vision may be described as a third way between the ‘war on drugs’ approach and drug liberalization. We are not against the user. Our overarching purpose is not ideological, religious or cultural but rather the welfare, health and dignity of both individual and society.

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Abbreviations and acronyms

ADHD	Attention deficit hyperactivity disorder
ASH	Action on Smoking and Health
BBC	British Broadcasting Company
CADCA	Community Anti-Drug Coalitions of America
CBD	Cannabidiol
CBN	Cannabinol
CBR	Cannabinoid receptor
CDT	Commission for the Dissuasion of Drug Abuse
DRUID	Driving under the Influence of Drugs, Alcohol and Medicines
EMCDDA	European Monitoring Centre for Drugs and Drug Addiction
ESPAD	European School Survey Project on Alcohol and Other Drugs
EU	European Union
EUR	Euro
EURAD	Europe Against Drugs
GABA	Neurotransmitter gamma-aminobutyric acid
HIV	Human Immunodeficiency Virus
INCB	International Narcotics Control Board
INN	International Non-Proprietary Name
LSD	Lysergic acid diethylamide
MDMA	3,4-methylenedioxy-N-methamphetamine
NHS	National Health Service
NO	Nitric Oxide
NOx	Nitric Oxide and Nitric Dioxide
SAMSHA	Substance Abuse and Mental Health Services Administration
THC	9- tetrahydrocannabinol
UNODC	United Nations Office on Drugs and Crime
UKDPC	UK Drug Policy Commission
UN	United Nations
US	United States of America
WHO	World Health Organisation

Preface

Cannabis is the most widely used illegal drug in the world today. Cannabis is also at the forefront of the legalisation debate, particularly after marijuana legalisation won a majority in two U.S. state referenda last year. Despite a growing evidence base, much uncertainty remains about the effects of cannabis on the health and welfare of the population. There is no doubt that cannabis use correlates with a wide range of negative outcomes, from mental health problems to poor academic achievement, reduced life satisfaction, relationship problems and unemployment, yet it is often very difficult to disentangle causes and effects. Nevertheless, it is becoming clear that cannabis is a risk factor for a range of negative health and social outcomes for the user, whilst its’ use also poses harm to others.

Those who regularly use cannabis remain a small minority (the EMCDDA estimates that 1% of Europeans use cannabis daily) which is small when compared to the use of both alcohol and tobacco. However, the commercialisation of both alcohol and tobacco may help to indicate the outcomes that a regulated cannabis system would result in. Factors like affordability, availability and acceptability have been shown to influence consumption of alcohol, tobacco as well as other commodities and these findings are likely to apply to cannabis too.

The current system of drug regulation, based on the UN Drug Control Conventions, provides an important framework for tackling the drugs issue through a joint recognition of the problem and commitment to international cooperation. This is not to say that it is perfect. In fact, any system that is confronted with reality will likely be flawed. However, if legalisation proposals are implemented they, too, will have to face reality. Most of the legalisation proposals are vague when it comes to the details of regulation. The current debate on cannabis often focuses on the unintended consequences of current drug laws but pay little attention to the unintended consequences of a system that creates a regulated market for cannabis.

EURAD is first and foremost a European network, and this report is written from a mainly European perspective. EURAD rejects the false dichotomy between legalisation and a war on drugs; instead seeking an approach based in the fertile middle ground, which emphasises the importance of prevention and recovery. In this report, we first explore some of the aspects that are pertinent to policy makers, such as harm to users and harm to others, before moving on to look at findings from the field of drug policy as well as lessons from other areas of public health.

We conclude that a comprehensive and evidence based approach is needed to address the issue of cannabis and that a restrictive approach plays an important part in this. A legal framework, however, cannot stand on its own. It needs to be strongly supported by a wide variety of policies and measures, from social inclusion, social protection and equal opportunities to evidence-based prevention and treatment. A public health approach to cannabis should aim to reduce exposure and harm, particularly young people and disadvantaged groups but it must also address the wider social determinants of health that influence drug use and drug related harm. Much more can and should be done within the current framework instead of embarking on a social experiment with an uncertain outcome.

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President, EURAD



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The background of cannabis



The cannabis plant (*Cannabis sativa* L.) grows in temperate and tropical areas. Herbal cannabis consists of the dried flowering tops and leaves. Cannabis resin is a compressed solid made from the resinous parts of the plant, and cannabis (hash) oil is a solvent extract of cannabis. Cannabis is usually smoked, often mixed with tobacco. Almost all consumption of herbal cannabis and resin is of illicit material. Some therapeutic benefit as an analgesic has been claimed for cannabis, with dronabinol and other drugs such as Marinol and Sativex being licensed medicines in some countries.

Pharmacology

The major active constituent in all cannabis products is Δ^9 -tetrahydrocannabinol (Δ^9 -THC or simply THC), also known by its International Non-Proprietary Name (INN) as dronabinol. Other closely related substances that occur in cannabis include cannabidiol (CBD) and, in aged samples, cannabinol (CBN), both of which have quite different pharmacological effects to THC. Other compounds include the cannabivarin and cannabichromenes; they are all collectively known as cannabinoids. The constituents of cannabis smoke are similar to those of tobacco smoke apart from the presence of THC (in cannabis) or nicotine (in tobacco). Cannabis smoke has the same carcinogens (substances that cause cancer) as tobacco smoke, although concentrations of these may be up to 50% higher and like tobacco, cannabis also contains toxic carbon monoxide (NHS, 2012).

When cannabis is smoked, THC can be detected in plasma within seconds of inhalation; it has a half-life of 2 hours. Following smoking of the equivalent of 10–15 mg over a period of 5–7 minutes, peak plasma levels of Δ^9 -THC are around 100 $\mu\text{g/L}$. It is fat soluble and widely distributed in the body.

Other metabolites are formed and further metabolised, most of which appear in the urine and faeces as glucuronide conjugates. Some metabolites can be detected in the urine for up to 2 weeks following smoking or ingestion.

Cannabis in the brain and body

The active ingredient in cannabis, THC, stimulates cannabinoid receptors (CBRs), located on the surface of neurons, to produce psychoactive effects. These receptors, which form part of the endocannabinoid system, are usually activated by a naturally occurring neurotransmitter called anandamide, which THC mimics, in order to bind with the receptor and activate the neurons. Cannabinoid receptors are widely distributed throughout the brain but are particularly prevalent in the brain regions which involve pleasure, cognition, concentration, memory, reward, pain perception and motor coordination. CBR activation also regulates the release of multiple neurotransmitters, including noradrenaline, GABA, serotonin and dopamine.

History of cannabis use in Europe

Although many people refer to cannabis' historic use, serious European investigation of cannabis really only began after Napoleon's expeditionary force into Egypt in 1798. About half a century later, a British physician returning from India (O'Shaughnessy) published work on the use of cannabis in medicine, which was followed by a publication on the uses and abuses of cannabis by Moreau de Tours in France (Commission of Inquiry Into The Non-Medical Use of Drugs, 1972). Whilst some European explorers may have used the drug earlier, it was apparently not until around 1844 that cannabis gained a small following in Europe.

Control status

Cannabis and cannabis resin are listed in Schedules I and IV of the United Nations 1961 Single Convention on Narcotic Drugs. In Article 1, Paragraph 1, of that Convention, cannabis is defined as: 'The flowering or fruiting tops of the cannabis plant (excluding the seeds and leaves when not accompanied by the tops) from which the resin has not been extracted, by whatever name they may be designated.' Cannabis resin is defined as: 'The separated resin, whether crude or purified, obtained from the cannabis plant' (United Nations, 1961). Along with a number of its isomers and stereochemical variants, Δ^9 -THC is

listed in Schedule I of the United Nations 1971 Convention on Psychotropic Substances (United Nations, 1971). Within a European context, no country has legalised cannabis. However, due to different interpretations and national adaptations the legality of cannabis possession (and indeed of all drugs) across Europe is far from uniform.

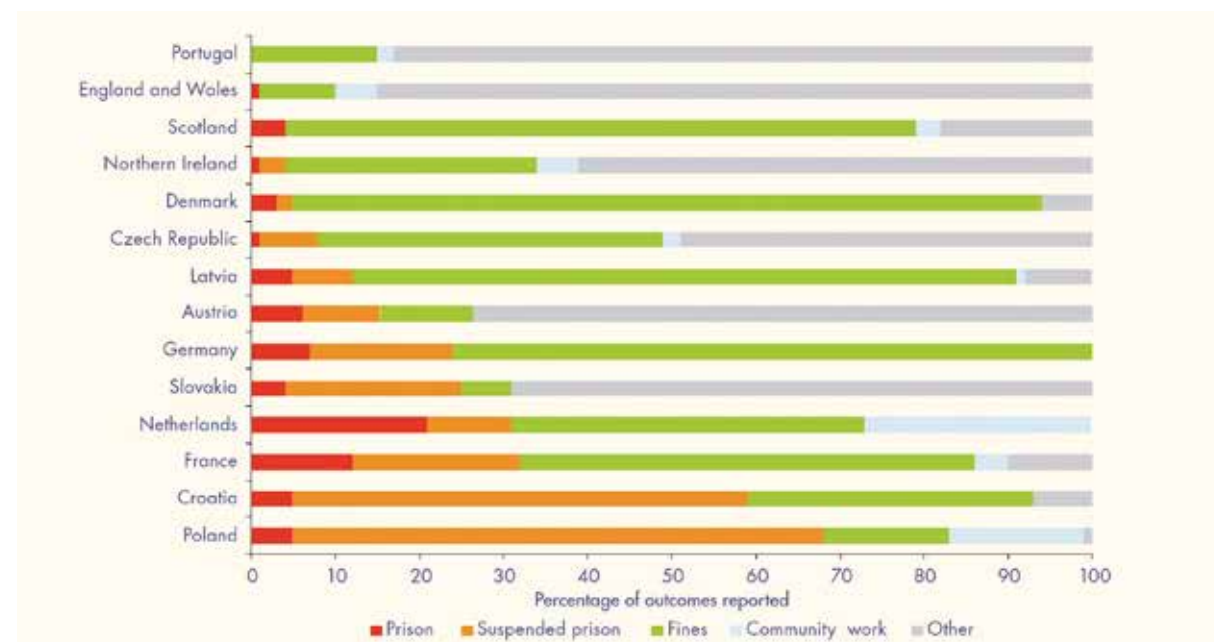


National drug laws are sometimes classified as 'liberal' or 'repressive' but such sweeping classifications are often misleading. For example countries referred to as 'repressive' may have an overarching but humane restrictive approach, with well-developed health and social services. On the other hand, some of the countries referred to as 'liberal', which tolerate some use of some drugs, may make a very clear distinction between what is acceptable and what is not, and may in some cases impose harsher penalties for those who cross the line than in other countries.

Although this is somewhat speculative, it may help to explain why The Netherlands demonstrates a significantly higher percentage of prison outcomes for drug possession compared to other countries in figure 1 (page 8).

Case study: drug use in Portugal

Figure 1: Outcomes reported for all types of drug use and possession offences (EMCDDA, 2009)



Overall, in the absence of aggravating circumstances, people charged with personal use offences in Europe are very unlikely to go to prison (EMCDDA 2002), with the most common sanctions for drug possession being warnings, fines and suspended sentences. Some countries use community work orders for drug related sentences but this is not widespread in Europe (EMCDDA 2009). In most countries there is a clear distinction between penalties for personal use and supply offences. A small minority of people may still go to prison for drug possession offences; however these cases are more likely to be due to:

- Unpaid fines
- Probation breaches
- Connections with other more serious offences which are not collected in the statistics

Supply offences, on the other hand, are likely to be punished with prison sentences. However, even in these cases, many receive suspended sentences; long prison sentences are rare.

The EMCDDA suggests that this is due to the fact that “drug barons” are few and far between and that the majority of cases involve mid-level suppliers (EMCDDA 2009).

Compared to other illicit drugs, cannabis is frequently given special treatment in the law by directive or by the judiciary, and recently a common trend towards alternative sanctions for use and possession of small quantities of cannabis has been noted. These sanctions include fines, cautions, probation, exemption from punishment and counselling. However, despite this trend, arrests for use-related cannabis offences are increasing in some countries (EMCDDA 2012a).

Recently, drug law reformers have hailed the Portuguese model as a successful drug strategy, due to how it deals with drug possession offences. This is investigated in more detail in the following case study.

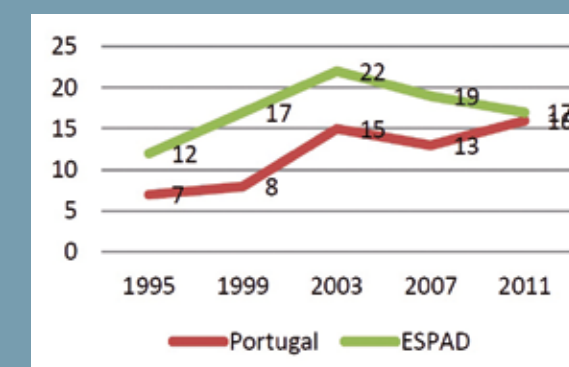
In 2001, Portugal decriminalised the use and possession of small quantities of drugs as one small part of a comprehensive drug strategy, which aimed to address international cooperation, primary prevention, access to treatment, social reintegration, drug trafficking and money laundering. This ambitious strategy aimed to double public investment in the drugs field and it is thought that between 1997 and 2004, there was a 10% year on year increase in drug-related investment in Portugal (EMCDDA, 2011a), reaching somewhere around EUR 159, 615 327 in its last year.

The law of 2000 maintained the status of illegality for the use or possession of any drug without authorisation. However, possession and use changed from a criminal to an administrative offence. So when a person is caught in possession of no more than 10 daily doses of drugs and the police have evidence that supply offences are involved, the drug will be seized and the case will be transmitted to the Commission for the Dissuasion of Drug Abuse (CDT). The CDT can then issue warnings, ban individuals from certain places, restrictions on meeting certain people, obligation of periodic visits to a defined place, removal of professional licence or firearms licence. Sanctioning by fine is also an available option (though not for addicts). Users found in possession of more than 10 daily doses will be prosecuted in court for a criminal consumption offence (EMCDDA, 2011a).

The implementation of the decriminalisation framework showed that in 2009 the majority of CDT rulings (68 %) were for provisional suspension of the process, for users who were not considered addicted. A further 15 % were provisionally suspended with an agreement to undergo treatment. Some 14 % were punitive rulings, comprising 4 % fines and 10 % non-pecuniary sanctions (mainly requiring periodic attendance in a place selected by the CDT). In total, 76 % of these processes involved cannabis alone (EMCDDA, 2011a).

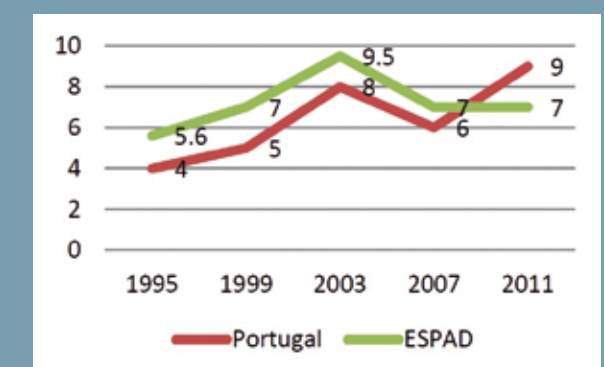
The benefits arising from the new strategy have been heavily debated, with some claiming that the increase in drug treatments services has been related to a decline in drug related deaths and HIV incidence in Portugal as well as claiming that decriminalisation did not lead to an explosion in drug use (Greenwald, 2009, Hughes & Stevens, 2012). While many countries in Europe have higher drug prevalence rates than Portugal, recent data show that there has been an increase in drug use among Portuguese youth, which many drug reform organisations have failed to point out (ESPAD 2011). Indeed, whilst drug use rates among young people in Portugal used to be among the lowest in Europe, this is no longer the case. The two diagrams below show that youth drug use in Portugal is now near or over the European average.

Figure 2a: Percentage of 15-16 year olds who have used cannabis at least once in their lifetime (a comparison between Portuguese data and the European average) (ESPAD, 1995-2011).



Lifetime Use of Cannabis

Figure 2b: Percentage of 15-16 year olds who have used cannabis in the last 30 days (a comparison between Portuguese data and the European average) (ESPAD, 1995-2011).



Cannabis Use in the last 30 days

Use patterns

Prevalence rates of cannabis use are often presented in terms of lifetime use, last year use and last month use. Lifetime use simply means people who have tried cannabis at least once in their life, with last month use being a more realistic measure of those who use cannabis on a more regular basis.

Figure 3: Prevalence of cannabis use across Europe (EMCDDA, 2011b)

Age Group	Lifetime Use	Last Year Use	Last Month Use
15-65 Years			
Estimated number of users in Europe	78 million	22.5 million	12 million
European average	23.2%	6.7%	3.6%
Range	1.5-32.5%	0.4-14.3%	0.1-7.6%
Lowest prevalence countries	Romania (1.5%) Malta (3.5%) Bulgaria (7.3%) Hungary (8.5%)	Romania (0.4%) Malta (0.8%) Greece (1.7%) Hungary (2.3%)	Romania (0.1%) Malta (0.5%) Greece & Poland (0.9%) Sweden (1.0%)
Highest prevalence countries	Denmark (32.5%) Spain (5.1%) Italy (32.0%) France & UK (30.6%)	Italy (14.3%) Czech Republic (11.1%) Spain (10.6%) France (8.6%)	Spain (7.6%) Italy (6.9%) France (4.8%) Czech Republic (4.1%)
15-34 Years			
Estimated number of users in Europe	42 million	16 million	9 million
European average	32%	12.1%	6.6%
Range	2.9-45.5%	0.9-21.6%	0.3-14.1%
Lowest prevalence countries	Romania (2.9%) Malta (4.8%) Greece (10.8%) Bulgaria (14.3%)	Romania (0.9%) Malta (1.9%) Greece (3.2%) Poland (5.3%)	Romania (0.3%) Greece (1.5%) Poland (1.9%) Sweden and Norway (2.1%)
Highest prevalence countries	Czech Republic (45.5%) Denmark (44.5%) France (43.6%) Spain (42.4%)	Czech Republic (21.6%) Italy (20.3%) Spain (19.4%) France (16.7%)	Spain (14.1%) Italy (9.9%) France (9.8%) Czech Republic
15-24 Years			
Estimated number of users in Europe	19 million	9.5 million	5 million
European average	30%	15.2%	8%
Range	3.7-53.8%	1.5-29.5%	0.5-17.2%
Lowest prevalence countries	Romania (3.7%) Malta (4.9%) Greece (9%) Cyprus (14.4%)	Romania (1.5%) Greece (3.6%) Portugal (6.6%) Slovenia & Sweden (7.3%)	Romania (0.5%) Greece (1.2%) Sweden (2.2%) Norway (2.3%)
Highest prevalence countries	Czech Republic (53.8%) France (42%) Spain (39.1%) Denmark (38%)	Czech Republic (29.5%) Spain (23.9%) Italy (22.3%) France (21.7%)	Spain (17.2%) France (12.7%) Czech Republic (11.6%) Italy (11%)

The distinction between these separate definitions is sometimes not made clear, leading the public to believe that cannabis is used more widely or frequently than it actually is. Whilst a relatively high proportion of people have tried cannabis at least once in their lifetime (around one in five 15 to 64 year olds in Europe), far fewer use it on a regular basis (3.6% of all 15-64 year olds in Europe claiming to have used it in the last month) and the share of daily users is 1% (EMCDDA 2012a). It is also worth noting that there has been a decline of 1% in last month cannabis users in recent years (between 2010 and 2012).

However, as we can see in Figure 2, cannabis use is significantly higher in the 15-24 year old age bracket in most countries in Europe, with an average of 8% of people in this age group using cannabis in the last month (down 0.4% from the previous year). This is particularly concerning given that the early onset of drug use is associated with the development in later life of more intensive and problematic forms of drug consumption (EMCDDA, 2010). So, it is fair to conclude that a small minority of young people use cannabis on a regular basis whilst a larger percentage of young people (around 1 in 4) have at least tried it once in their lives.

Drug use in Europe is considerably more common among men than among women, particularly when referring to more frequent or intensive use of drugs (EMCDDA, 2006). This is also true for cannabis, with higher lifetime prevalence among males than females in most European countries. Among adult drug users male predominance increases as the observation time frame is shortened from lifetime through last year to last month use.

This is also true among 15- to 16-year-old school students, with gender differences being considerably more marked among those who report ‘frequent use’ of cannabis (40 or more times during a lifetime) compared to less frequent use. Among students who frequently use cannabis, the prevalence among male students can be twice, three times or even four times higher than for female students.

In terms of social or economic dynamics, cannabis use is also correlated with socially disadvantaged groups, such as early school leavers, children in care institutions and young people living in economically deprived neighbourhoods (EMCDDA, 2008) but this is by no means the whole picture. Cannabis use is also higher amongst young people who frequently attend nightclubs, pubs and music events and is associated with the use of other illicit drugs, as well as with alcohol and tobacco use (EMCDDA, 2010).

Changing cannabis use and cultivation patterns

Although the prevalence of cannabis use varies between countries in Europe, the overall pattern is broadly similar, in that cannabis has developed as the most commonly used illicit substance, with development seen later in Eastern Europe (EMCDDA, 2012a). Even up until the early 1980s, only a few countries in Europe reported high rates of cannabis use, and whilst many countries saw significant increases in use during the 1990s and early 2000s, a large number of countries are now reporting either stabilising or even decreasing use of cannabis (EMCDDA, 2011), although of course, levels are still high in historical terms.

Moreover, a more potent variant of cannabis, skunk (sinsemilla, the unfertilised floral parts of the female plant), has become more readily available in many European countries. This more potent variety can have a THC concentration of around 16-20%, compared to 4% in marijuana or resin. Whilst there has been relatively few studies looking at the impact of this stronger form of cannabis (Casadio et al, 2011; Jenike, 1993), there is already evidence to suggest that higher THC content can increase anxiety, depression and psychotic symptoms, dependence and increase adverse effects on the respiratory as well as cardiovascular systems in regular users (Hall & Dagenhard, 2009).



The increase in cannabis potency and spread of skunk since the late 1990's may in part be due to changes in cultivation patterns, as there has been a move to more indoor growing. Such indoor growing facilities have become more sophisticated over the last decade, with the United Kingdom for example, reporting a shift from cultivation in domestic dwellings to the use of highly organised commercial or industrial units, where crops can be grown under a more controlled environment (EMCDDA, 2012b). Within all of these environments, extreme bright lighting is used. Whilst this is vital for photosynthesis, increased light intensity also increases the overall THC content of cannabis.

These cultivation patterns differ from those seen in Europe until the 1980s, as at that time, resin (hashish) had been the dominant cannabis product. This changed with the arrival of skunk into The Netherlands in the mid-1980s (EMCDDA, 2012b). Today, several hundred varieties of cannabis are commercially available and since the possession of cannabis seeds is not an offence in any European country, seeds are traded freely across international borders.

Overall, it appears that cannabis herb is mostly produced for sale in domestic markets and in neighbouring countries whilst resin is produced largely for export. In Europe, the main source of imported cannabis products are Morocco, Afghanistan, Albania, Lebanon and South Africa, which still account for a significant proportion of European cannabis products (EMCDDA, 2012b). In terms of cannabis seeds, The Netherlands would appear to be the world's largest seed exporter, followed by Canada, from where many varieties are exported to Europe (UNODC, 2006).

Why people use cannabis

Understanding a person's motivation and wider social factors that lead a person to use cannabis and other substances is essential in order to develop effective public health interventions. Whilst some may believe that drug use is based on a rational appraisal process, others believe that it is a reaction to a context or environment in which cannabis is readily available (Boys et al, 2001). Lessons from other public health areas indicate that health behaviour is not simply a matter of individual choice but is shaped by a whole host of social, cultural and economic patterns, more commonly referred to as the social determinants of health.

Rather than shift full responsibility for use onto the user, effective drug policies must address the complexities of the social circumstances that generate drug use and be supported by a wider framework of social and economic policies (WHO, 2008). Social acceptability, availability and price are examples of factors that are likely to impact on the use of drugs. We can see that this is the case in other areas of public health, e.g. economic and agricultural policies may be more effective in reducing the availability of high-fat and high salt food and therefore levels of obesity, than traditional health promotion approaches (WHO, 2003a).

The societal and environmental factors that influence drug use provide an important backdrop

to understand patterns of drug use in a society. However, on the individual level people cite a variety of reasons to explain why they use substances. For instance, the most popular reasons cited to use cannabis among young people are to relax (96.8%), to become intoxicated (90.7%) and to enhance activity (72.8%). Cannabis is also used to decrease boredom (70.1%), to sleep (69.6%) as well as to feel better (69%) (Boys et al, 2001).

In terms of interactions with other types of drug use, some may use cannabis the day after using a stimulant drug such as MDMA (EMCDDA, 2012a). Disorders such as bipolar disorder, ADHD, panic anxiety and major depression (Wittchen et al, 2007) are also positively correlated with the onset of cannabis use, as are behaviours such as impulsiveness and aggression, although such factors are not often provided by individuals if they are asked for the reasons why they use.

Studies have identified a number of social and individual risk and protective factors that correlate with the use of cannabis and other drugs. However, it is worth noting that correlation is not necessarily causation, and that apparent connections may be caused by some unknown underlying characteristic. It seems likely that vulnerabilities, protective factors and drug exposure interact to explain use and harms. It is also worth considering that the causal pathway of drug use may run both ways. People may turn

Should we be concerned about prevalence rates?

Some drug policy reform groups argue that even if there were an increase in the use of drugs such as cannabis, there would be a decrease in overall harm under a legally regulated system (Transform, 2007) and that the number of people who use a drug may not be correlated to the harms caused by the drug. However, we can see from areas such as tobacco and alcohol that use and harms are closely associated as there is a strong evidence that when consumption increases in a society, there tends to be an increase in the prevalence of heavy users and other related harms (Babor et al, 2010), such as drink driving, violence and ill health. In the case of cannabis, recent evidence from US states where medical marijuana is legal shows that they have higher levels of both use and abuse/dependence than states where use is not legal but further research is needed to examine whether the relationship is causal (Cerdeira et al, 2012).

to drugs or other substances to numb the pain of personal, economic and social conditions, however their use often leads to further downward mobility (WHO, 2003). The irony is that, apart from a temporary release from reality, drugs and other substances can intensify the factors that led to its use in the first place.

In terms of peer usage, Ali (2011) argues that it is important to distinguish between ‘peer influence’ and ‘peer selection’, the latter signalling that people in most cases choose who to associate with. This is important when discussing health behaviours because ‘peer influence’ suggests that the behaviour is due to the peer group, whereas ‘peer selection’ simply means that likeminded people are more likely to engage in similar behaviours.

Manski (1993) goes further to develop an explanation of three separate peer effects, which could have an effect on individual behaviour:

- 1. **Endogenous Effect:** An individual feels compelled to use drugs in order to fit in with

their peer group. Targeting an individual to change their behaviour may be effective as it may have a multiplier effect to the rest of their peers.

- 2. **Exogenous or Contextual Effects:** An individual behaviour responds to an external stimulus, for example, a parent uses drugs and so their children do and it spills over to the child’s friendship group. Targeting the adolescents in this case is unlikely to be completely effective as it is not the root of the problem.
- 3. **Correlated Effect:** Individuals in the same group behave in a similar manner due to unobserved characteristics, for example, children from similar socioeconomic backgrounds or with similar personalities. If one of them stops using drugs, it may not impact the others in the group as something unobserved is driving them all to use drugs.

Medical cannabis

Since 1996, 15 states in the US have permitted personal possession of cannabis for medical



use, most commonly for conditions such as pain, insomnia and anxiety (Reinarman et al, 2011).

Critics have worried that medical marijuana sends a mixed message to young people about the harmfulness of the drug and that it can influence risk perception.

There is at least some empirical evidence to suggest that medical marijuana states have lower perception of risk and higher average adolescent marijuana use (Cerda et al, 2012; Wall et al, 2011). However, the available data cannot establish causality. Data from the Substance Abuse and Mental Health Services Administration show that 14 of the 18 states with the highest share of past month cannabis users (12-17 years) are medical

marijuana states. Fourteen of the twenty states with the lowest perception of risk for smoking marijuana among 12-17 year olds are medical marijuana states (CADCA, 2012).

The American Association of Child and Adolescent Psychology (2012) argues that medical marijuana has influenced perceptions of risks and benefits, and that since the ‘medicalization’ of marijuana adolescents’ risk perception has decreased and marijuana use has increased significantly. Their report also points to emerging evidence that adolescents are accessing medical marijuana for recreational use.

A recent study from Colorado confirms that diversion of medical marijuana may be a major issue. Three out of four teens in treatment for substance abuse reported that they had used diverted medical marijuana on an average of fifty occasions.

Researchers concluded that medical marijuana use among adolescents in substance abuse treatment is very common, implying substantial diversion from registered users (Salomonsen-Sautel et al, 2012).

The U.S. Department of Justice has expressed concern that marijuana production is increasing under the cover of medical marijuana laws. Studies indicate that Colorado, a medical marijuana state, increasingly has become a source of high potency marijuana in neighbouring states (US Department of Justice, 2011). Assessments indicate that Colorado’s regulations are insufficient and that medical cannabis is being diverted for recreational purposes in all links of the supply chain (Rocky Mountain High Intensity Drug Trafficking Area, 2012). The provision of medical cannabis varies from state to state but most states allow patients to grow their own cannabis, which means that cannabinoid levels are unpredictable.

Figure 4: A selection of risk and protective factors relating to cannabis use

Risk or Protective Factor	Explanation
Time with parents	Lifetime cannabis users are less likely to spend time regularly with both their mothers and fathers (Best et al, 2005)
Early initiation	Early initiation of alcohol and cannabis use is associated with more frequent use (Best et al, 2005)
Time with peers who use substances	Lifetime cannabis users are more likely to spend time with peers with use alcohol and cannabis (Best et al, 2005). A 10% increase in cannabis use among peers is associated with a 4.4% increase in individual cannabis use (Ali et al, 2011)
Price	Low price of cannabis is associated with its’ use
Religion	Being religious is inversely related to drug use (Pacula, 2001)
Risk perception	The risk of the drug is associated with whether someone uses it (Pacula, 2001)

Harms to users and young people

Cannabis use is associated with a range of both physical and psychological harm, drug addiction, road traffic accidents, learning outcomes, reduced employment opportunities and relationship problems.

Cannabis use is linked to a number of health risks beyond the immediate effects which are commonly cited by users.

Aside from the effects listed above, cannabis use also increases the risk of serious psychiatric illness, with users of skunk, (now the most commonly used type of cannabis in Europe) being seven times more likely to develop a psychotic illness such as schizophrenia than people not using cannabis. Cannabis also interferes with coordination, causing problems with balance, walking and driving (BBC, 2012).

Figure 5: Immediate impacts of cannabis use (Hall & Degenhard, 2009; Zimmer & Morgan, 1997)



Cannabis and mental health

Cannabis can cause short-term psychotic experiences, such as hallucinations and paranoia in healthy people, but researchers have also long noted a relationship between cannabis and schizophrenia, anxiety and depression (Andreasson, 1987; Bovasso, 2001; Brook et al, 2001 & Hayatbakhsh, 2007).

Most of the recent data rejects the view that marijuana is used to self-medicate psychotic or depressive symptoms and whilst doubts still remain about whether cannabis is the cause of such symptoms, the weight of the evidence points in the direction of early and regular cannabis use having substantial negative effects on psychosocial functioning and psychopathology (Rey et al, 2004).

When compared to those who have never used cannabis, young adults who began using cannabis at age 15 or younger are twice as likely to develop a psychotic disorder and four times as likely to experience delusional symptoms. This trend persists in studies of sibling pairs, therefore reducing the likelihood that the association was related to unmeasured genetic or environmental influences (UNODC, 2012). While the exact nature of this relationship remains unclear, the amount and frequency of the cannabis used, the age at first use and genetic vulnerability may all play a role (Saban & Flisher, 2010).

A number of studies have shown a convincing relationship between suicidal thoughts, behaviours and cannabis use (Greenblatt, 1998). Regular use is also associated with an increased risk of developing long-term schizophrenia, and over the past few years, research has strongly suggested that there is a clear link between early cannabis use and later mental health problems in those with a genetic vulnerability as well as in those who started using cannabis as an adolescent (Royal College of Psychiatrists, 2012). For example, one study of 45,000 participants found that the heavy use of cannabis at age 18 increased the risk of schizophrenia later in life by 6 times (Andreasson et al, 1987), whilst another

found that the earlier the use of cannabis, the greater the risk of schizophrenia (Arseneault et al, 2002).

Some studies have also found that ongoing cannabis use increases hospitalisations for people who have schizophrenia and this could be due to a greater risk of failure to take prescribed medications among people who use cannabis (Miller et al, 2010). As the illness generally causes multiple relapses (which is higher in those who use cannabis), it contributes to multiple hospital stays and accounts for a remarkable percentage of all permanently disabled people especially in younger age groups.

Cannabis and cancer

Long-term cannabis smoking also increases the risk of lung cancer in young adults. It has been found that the risk of lung cancer increases 8% for each year of cannabis smoking, even after adjusting for confounding variables such as cigarette smoking (Aldington et al, 2008). This is similar to the increase for every pack year of cigarette smoking (Brambilla and Colonna, 2008).

Cannabis and the heart

Cannabis is known to increase and decrease parasympathetic activity and to increase heart rate and is associated with supine hypertension and postural hypotension as well as increased cardiac output. Cannabis can also reduce the oxygen-carrying capacity of blood.

Previous studies have shown connections between cannabis use and an increased risk of stroke. Whilst many of these studies have not been able to differentiate between the effects of cannabis and tobacco smoking (because they are mostly used concurrently), it is clear there is some effect with cannabis appearing to double the risk of stroke (Hughes et al, 2013). Further research is needed to tease out the confounding effect of tobacco use, if this is possible.

Cannabis and pregnancy

Pre-natal exposure to cannabis is associated with common neurobehavioural and cognitive outcomes, including symptoms of ADHD

(inattention, impulsivity), increased externalising behaviour, decreased general cognitive functioning and deficits in learning and memory tasks (Huizink & Mulder, 2006).

The neurotoxic impact of cannabis on young people

Cannabis use specifically during adolescence may have neurotoxic effects, as puberty is a critical time for brain development, which



makes the brain particularly vulnerable to 'toxic insult'. Persistent use of cannabis is also associated with neuropsychological decline, with accumulating evidence showing that users with long-term, heavy cannabis use consistently perform worse on neuropsychological tests than non-users (Solowij & Battisti, 2008; Pope & Yurgelun-Todd, 1996 & Fletcher, 1996). A recent study of over 1000 participants, which followed participants from birth until the age of 38 found that persistent cannabis use was associated with neuropsychological decline broadly across the domains of functioning, even after controlling for years of education (Meier et al, 2012).

In particular, executive functioning and processing speed were affected by persistent cannabis dependence. Impairment was also apparent to friends and family members of the participants in the study, both in regard to attention and memory. Unfortunately, impairment among adolescent-onset former persistent cannabis users was still evident 1 year or more after cessation, suggesting that cannabis use during adolescence does indeed have a toxic effect on the brain during this critical development stage. Moreover, persistent cannabis users demonstrated greater IQ decline between the ages of 13 and 38 than non-users, with persistent users experiencing declines of up to 6 IQ points whereas study members who never used cannabis experienced a slight increase in IQ. This particular result was again only valid for adolescent-onset cannabis users, highlighting the need to increase efforts to prevent the onset of cannabis use by young people.

Whilst persistent cannabis users may experience greater neuropsychological decline relative to non-users because they receive less education, the results of this study found that such decline does not occur solely for this reason, as the decline was still apparent after controlling for years of education. Therefore, the authors concluded that the toxic effects of cannabis on the brain may result in impaired neuropsychological functioning, poor academic performance and subsequent school drop-out, which then results in further neuropsychological decline.

Cannabis' impact on learning, employment and life satisfaction

The impact of cannabis on someone who consumes it is, however, not restricted to health. Rather, cannabis use is linked with unemployment as well as reduced life satisfaction compared to non-cannabis users. These results remain significant even after controlling for family socio-economic status, family functioning, exposure to child abuse, early academic achievement and mental health disorders and other substance use (Fergusson & Boden, 2008). In terms of the personal economic impact of using cannabis, one study of 6,000 students found that those who used cannabis from age 13 but had decreased their use to only several times a year as young adults, still lagged behind non-users in terms of earnings and education when re-surveyed at age 29 (Ellickson et al, 2004).

Personal relationships can also be affected by cannabis use. Higher levels of cannabis are associated with lower satisfaction with intimate romantic relationships and lower satisfaction with life, work, family, friends as well as leisure pursuits (Fergusson & Boden, 2008).

Cannabis treatment among young people

Although some people question the concept of cannabis addiction, a wide range of clinical studies clearly indicate that the condition exists (Budney et al, 2007; Budney & Hughes, 2006; Copeland, 2004; Roffman & Stephens, 2006) and some of the same studies have found that around 1 in 9 of people who try cannabis develop addiction (Budney et al, 2007). However the risk of addiction increases to 1 in 6 among people who start to use cannabis in adolescence. In Europe, cannabis is now the second most reported drug after heroin for people entering drug treatment (EMCDDA, 2011c), with around 98,000 treatment entrants naming it as their primary drug in 2009 alone. Furthermore, cannabis was the most frequently reported secondary drug, mentioned by 28% of all treatment entrants (93,000 clients). However, it is likely that this number still only represents a small percentage of those who may benefit from treatment, as studies carried out in

America have suggested that only around 7 to 8% of people who report problems with cannabis use receive treatment (SAMSHA, 2006). Seeking drug treatment is not just confined to daily users. Of those entering treatment, 49% of primary cannabis clients are daily users, about 18% use it two to six times per week, 12% on a weekly basis or less often. Interestingly, 22% are occasional users (having used it in the month before entering treatment) (EMCDDA, 2011c).

The average age of people entering treatment for cannabis dependence in Europe is 25, making it the youngest client groups entering drug treatment. Cannabis is the primary drug for about 8 in 10 drug treatment entrants under the age of 20, and the majority of these are young men (with around five males to every female) (EMCDDA, 2011c).

The number of primary cannabis users seeking treatment increased by 40 % between 2004 and 2009 (EMCDDA, 2011c), in spite of stabilising cannabis use rates across Europe. It is worth noting that the majority of these people sought treatment on their own initiative, rather than being referred (EMCDDA, 2010). Factors influencing the increase in people seeking drug treatment for cannabis may include lower age of initiation and persistent use of the substance (Coffey et al, 2003; Room et al, 2008) as well as the higher potency varieties which are now more available.

The connection between cannabis use and other substance use

The topic of whether cannabis acts as a gateway drug that increases a user's probability of taking up 'harder' drugs like amphetamine, cocaine or heroin has received considerable academic and political attention over the last few decades.

Those who challenge the gateway theory say that testing for it poses a statistical challenge as unobserved factors may influence both the probability of cannabis use as well as the use of other drugs. For example, a traumatic childhood could be causally important for both cannabis as well as later use of methamphetamines or heroin. Indeed, such confounding factors should be taken account of.

A central question is therefore whether a relationship still exists between cannabis and future use of other drugs after accounting for potential confounders, and whether or not this relationship is due primarily to correlation or causation. Whilst several studies have investigated this issue and accounted for confounding factors, the results have been in some cases, quite conflicting. Indeed, some of these studies have shown that there is still a significant association between cannabis and further drug use (Fergusson et al, 2006), whilst others have shown that the effect is smaller (Hall & Lynskey, 2005). A more recent study, which allowed confounding factors to influence each other under a latent class bivariate hazard model and which used only other cannabis users as the control group, still found that the hazard of starting to use hard drugs more than doubles (2.6 times more likely) after using cannabis and after controlling for the influence of other factors (Melberg et al, 2010).

However, according to this study, this 'staircase' effect from cannabis onto other harmful substances was more pronounced with a particular sub-set of individuals, particularly those who reported having had childhood problems with the police, school, friends and parents as well as those who reported having started their illicit drug use at an earlier age. Again, those who had started cannabis use

at an average age of 15.6 years were more likely to escalate to other forms of drug use than those who started later, at an average age of 18.9 years (Melberg et al, 2010).

This finding combined with the other findings in this report which suggested adolescent onset of cannabis use is associated with reductions in executive brain functioning, speed processing, IQ decline and cannabis dependence all highlight the need for targeted actions which specifically aim to increase the age of initiation. Such actions, if effective, could prove useful not only reducing the overall prevalence and harm caused by the use of cannabis, but may also be useful in reducing the use and harm of other drugs.

It is sometimes argued that the gateway effect of cannabis is a result of the legal framework. Some say it is linked to a psychological threshold that makes it less costly to the individual to proceed into another stage of drug use after already engaging in illicit activities related to cannabis use or that users simply come into contact with dealers who sell other types of drugs and therefore they become exposed to them on a practical level. If this were the case, the Dutch model of cannabis coffee shops would have been shown as effective in terms of separating the hard and soft drug markets.

However, a study of illicit drug use carried out by analysing sewerage across 19 European Cities in 2011 (Thomas et al, 2012), found that Amsterdam, Eindhoven and Utrecht were among the cities showing highest loads of cocaine in wastewater and were the top three cities for highest load of ecstasy (MDMA), with an average load of between 67 and 616mg MDMA/day/1000 inhabitants. The Dutch cities (particularly Eindhoven) also showed up to ten times the rate of amphetamines in the wastewater of other European cities. These results suggest widespread use of other illicit drugs in The Netherlands as well as evidence of production. To date, there has been no evidence that the policy of cannabis coffee shops in The Netherlands has led to any sort of separation between the drug markets (Trimbos Instituut, 2009).

Case study: The Netherlands

The current Dutch drug policy began in the 1960s and 1970s. During that time, things changed dramatically in the Netherlands. The use of cannabis increased in the wake of the so-called hippie movement, where cannabis was intended to be a form of dissociation from the predominant materialistic culture. Drug use increased, especially the use of cannabis, LSD and, to a certain extent, opium. The views on cannabis were part of a broader political discussion at the time (1965-1976) on subjects such as pornography, prostitution, abortion and euthanasia. The overriding consensus was that morality and criminal justice should not be combined (Koopmans, 2011).

In 1972, when heroin flooded the Dutch market, the focus of attention shifted to creating a 'separation of the markets of hard and soft drugs'. At that time, cannabis was considered not be addictive and less harmful than other drugs in The Netherlands. Cannabis use and small scale selling were then decriminalized. Officially the possession of soft drugs was (and still is) punishable by law, however, it is tolerated, or perhaps best summed up by the Dutch word 'gedogen', which is the word to 'condone' or 'to put up with'. In 1980, the first coffee shop, which has become one of the most well-known features of the Dutch drug policy, was opened. Throughout the 1980's, the development of the coffee shops proceeded with minimal intervention from the Dutch government and the result was an enormous increase in the number of outlets. Cannabis use in the 18-20 year age group more than doubled from 15% to 33% from 1984 to 1992 (Koopmans, 2011).

Dr Martien Kooyman, Addiction Psychiatrist, from The Netherlands¹ notes that "From the beginning of this century, the THC content in the cannabis sold in The Netherlands increased to such a high level, that the drug has changed in its effects. Instead of a drug used predominantly to have fun, it has become a drug to escape from the stress of life and to be able to sleep. Instead of a soft drug, it is now a hard drug. The use has changed from recreational on weekends to using it alone and daily. In detox centres across The Netherlands in recent years, more than half of the admitted adolescent patients are solely addicted to cannabis".

Currently, approximately 29,000 people in the general population of The Netherlands meet the requirements for the diagnosis of cannabis dependency and a further 40,000 meet the requirements for the diagnosis of cannabis misuse. Between 1994 and 2008, the number of primary cannabis clients in The Netherlands rose from 1,951 to 8,410 (Koopmans, 2011). Whilst the use of cannabis certainly remains higher amongst young Dutch people than for the average young European, the rates are comparable to countries like France and The Czech Republic, where rates of cannabis use among young people is also high (ESPAD, 2011).

More recently, there has been a move towards a more restrictive policy. In June 2011, the Cabinet approved measures to reduce drug-related nuisance and drug tourism. The Cabinet proposed that coffeeshops become private clubs for the local market only accessible to Dutch citizens upon display of their ID's, although this measure is now being implemented at the discretion of localities. There have also been increased controls at Schiphol airport in Amsterdam on inbound flights from the Caribbean and some South American and West African countries, which are thought to have resulted in a decline in the number of drug couriers coming from those countries (Koopmans, 2011).

The reasons for the move towards a more restrictive system are multi-faceted but it appears to be linked to the foothold which international organised criminal groups have in Dutch society. To the layman it may not be obvious that to the front-door of the cannabis coffee shops in The Netherlands, there is an illegal and criminal back door. Even during the 1990's, there were approximately 600 criminal groups operating in The Netherlands, with around 73% of them involved with drug trafficking (Van Doorn, 1993).

In spite of the government's long-term efforts to combat production of and trafficking in narcotic drugs, The Netherlands continues to be a significant transit point for drugs entering Europe, an important producer and exporter of synthetic drugs and an important consumer of most illicit drugs (INCB, 2003).

⁽¹⁾ Dr. Martien Kooyman is the founder of treatment centers for addiction in The Netherlands, such as the Emiliehoeve Therapeutic Community. He was previously the Medical Director of methadone programs in The Hague and Leiden and later a director in The Hague Drug-free Program, the Bouman Foundation in Rotterdam the Jellinek Centre in Amsterdam, a clinic in Oegstgeest and a clinic for refugees, as well as teaching at Erasmus University, Rotterdam He has a private psychotherapeutic practice and is currently Vice-President of EURAD.

Harms to others and society

Some people strongly believe that governments should not intervene on the issue of cannabis (or any other drug use), claiming that the use of the substance is purely an issue of personal choice or individual freedom. One such argument may be that using cannabis responsibly causes no harm to society and should therefore be of no interest to governments (NORML, 2012) ⁽²⁾. Such arguments however ignore the third party impacts of cannabis use.

Family and friends

Family members and close friends can experience significant stress and suffer health problems as a result of being close to and concerned about someone who uses drugs. A report carried out in 2008 in Scotland found that 134,000 adults were significantly affected by a relative's drug use and that the cost of those harms could be estimated at around £229 million per year.

Moreover, the report also found that if the support offered by friends and family had been provided by health and social care providers, it would have cost £95 million per year in Scotland alone (Copello et al, 2012). Taking into consideration the fact that about 9% of cannabis users develop some form of dependence, the toll on others may be quite significant at a population level. Friends and family who do not use cannabis may also find themselves occasionally or regularly exposed to indoor cannabis smoke.

Cannabis smoke

Although it is sometimes assumed that cannabis smoking poses similar risks in terms of respiratory disease and cancer that tobacco smoke poses, one study which compared both the mainstream and side-stream smoke produced from both substances found that the number of chemicals present in cannabis smoke were substantially higher than in tobacco smoke.

In terms of the concentration of chemicals found in the smoke, NO as well as NO_x, hydrogen cyanide and aromatic amines were all found to be present in cannabis smoke at 3-5 times the level than mainstream tobacco smoke, while ammonia

was present at levels 20 times higher than in tobacco. Conversely, several chemicals were found to be moderately higher in tobacco smoke than in cannabis smoke, such as polycyclic aromatic hydrocarbons, formaldehyde and acetaldehyde (Moir et al, 2008). The impact of cannabis smoke particularly affects those who socialise with the person who uses cannabis and where a user smokes cannabis at home, children may be exposed.

Drug driving

Cannabis use is associated with a significantly increased risk of being involved in a motor vehicle accident (Li et al, 2012). At the European level, alcohol is estimated to be used by 3.48% of drivers, whilst illicit drugs are estimated to be used by 1.9% of drivers, with THC being the most frequently detected drug, before cocaine (DRUID, 2012).

A study carried out in France suggested that recent cannabis consumption is particularly common among drivers involved in accidents who are aged under 25 (with 17% testing positive for cannabis) (Biecheler, 2011).



Studies also suggest that cannabis-involved driving has increased in recent years. A recent US study showed that nearly 1 in 10 night time drivers tested positive for cannabis. In some jurisdictions the figure was as high as 1 in 5. Drivers who reported having a medical cannabis permit were significantly more likely to test positive for THC (Johnson et al, 2012).

A systematic review of nine case-control studies found that recent cannabis use almost doubles the odds of having a motor vehicle accident (odds ratio 1.92) (Hall, 2012), whilst other research has suggested that habitual users of cannabis are 10 times more likely to be injured, or to injure others, in car accidents (Blows et al, 2005).

The authors who carried out the first study found that their results were consistent with experimental evidence that cannabis use leads to dose related impairments in simulated driving, psychomotor skills and on-road driving (Ramaekers et al, 2004). Not only are road users affected but close friends and family may find themselves at a heightened level of exposure to drug driving, in some cases, without realising it.

Whilst it is difficult to evaluate the impact that roadside drug testing would have were it to be implemented, it is essential that comprehensive evaluations are undertaken. It may be particularly interesting to establish whether more targeted interventions towards young drivers and regular cannabis users would be more beneficial than a broad reaching campaign targeting the public at large.

Impact on the workplace

Drug use also affects psychomotor skills in other ways apart from driving, with one workplace study from the US finding that those who tested positive for cannabis in urine analysis had 55% more industrial accidents and 85% more injuries than those who tested negative. The study also found those who tested positive suffered from a 75% increase in absenteeism, compared to those who tested negative (National Institute on Drug Abuse, 2011).

Criminality

Even though people frequently report that they use cannabis to relax, surveys conducted in The Netherlands have found strong associations between delinquent and aggressive behaviour and cannabis use, which become stronger with increasing frequency of use (Rey et al, 2002), even after taking account of confounding factors such as alcohol use. Other studies have suggested that occasional predisposed individuals, especially if under stress, can become aggressive after taking cannabis, whilst others can react in a violent way if they experience paranoia or fear during cannabis intoxication (Ashton, 1999) but it could be assumed that this would be more common with first time or irregular users.

For regular users however, aggressivity can also be associated with cannabis withdrawal symptoms (Kouri et al, 1999).

In terms of wider scale criminality, some believe that the current legal framework of cannabis in most countries has adverse consequences for society by creating black markets (The Beckley Foundation, 2008). Whilst this may be true to some extent, it would also be naïve to assume that a regulated cannabis market would eliminate this black market.

One main challenge a regulated market would face in this regard is the fact that most cannabis users are young people. It is highly unlikely that any government would wish to allow under-age sales of cannabis and groups advocating for decriminalisation or legalisation do appear to support age restrictions under a regulated cannabis market, for example, no sales to people aged under 16 or 18.

Therefore, whilst initiatives like the Cannabis Social Clubs in Spain may attempt to disentangle cannabis production and sale from the hands of criminal groups, they are still limited in their effect, as only a certain proportion of cannabis users will use such a facility (for example, people who do not want to be openly identified as a cannabis user) and young people of course, would most probably be excluded due to age, meaning that they would still be engaged in a black market.

Healthcare

Cannabis dependence is entirely preventable yet across Europe nearly 200,000 people enter drug dependence treatment each year with cannabis as either their primary or secondary drug. European data shows that the share of cannabis users in treatment varies between just over 30% in some countries to less than 10% in others.

Cannabis treatment is usually provided in an outpatient setting. Treatment programmes include counselling, psychosocial interventions, internet-based treatment and treatment in residential settings.

The client group is relatively young, with a mean age of 25 years old. It is worth noting that cannabis is the primary drug for about eight out of ten treatment entrants under the age of 20 years.

The EMCDDA cites a recent German study that predicts increasing demand for cannabis treatment in the future. While treatment services are able to reach around 50% of users with opioid dependence, only a small minority (4-8 %) of cannabis users in need of treatment are reached (EMCDDA, 2010).

Public opinion

A Eurobarometer study from 2011 among 12,000 15-24 year olds showed that nearly 6 out of 10 young people (59%) thought cannabis should continue to be banned. This figure varied from 33% in the Netherlands to 87% in Romania. Opinions were also highly related to past year use. Interestingly, 17% of those who had smoked cannabis supported a continued ban, whilst 71% of those who had never used cannabis supported it. Support for a continued ban on heroin (96%), cocaine (94%) and ecstasy (92%) were however nearly unanimous (European Commission, 2011).

The survey also found that 91% of young people recognised health risks (medium or high) associated with the regular use of cannabis.

In terms of how to best tackle the illicit drug phenomenon, 64% of young people agreed with tough measures against drug dealers and traffickers, whilst 49% also believed in information/prevention campaigns and 37% mentioned treatment as an important strategy. Only 13% argued that the legalisation of drugs would be the most effective way of fighting drug problems.

In a 2006 Eurobarometer poll of 29,000 adult respondents, around 3 out of 4 adults said that cannabis should not be legal for personal use. Support for making possession a non-criminal offence was highest in the Netherlands with 49%, but even here it was not a majority position. Support was also high in Spain (40%), Great Britain, the Czech Republic and in Ireland (30%). In an intermediate position were Austria, France and Italy (28%), Portugal (27%), Belgium (26%) and Germany (19%). In Romania, Sweden and Finland less than 10% agreed (European Commission, 2006a).

A recent poll conducted among members of the British Parliament showed that a clear majority (76%) of politicians from all parties were dissatisfied with the strategies used in the UK to tackle problems caused by illegal drugs. However, in terms of how best to tackle it, only between a quarter and a third of politicians supported

changes to the drug laws so that possession of small quantities of illegal drugs for personal use is not treated as a criminal offence (UKDPC, 2012).

Support for legalisation of cannabis is much weaker in Europe than it is in the US, with a clear majority of young people, adults and politicians favouring a continued ban on cannabis. While information about politicians' attitudes is scarce, the UKDPC poll does seem to indicate that they reflect the opinions of the electorate.

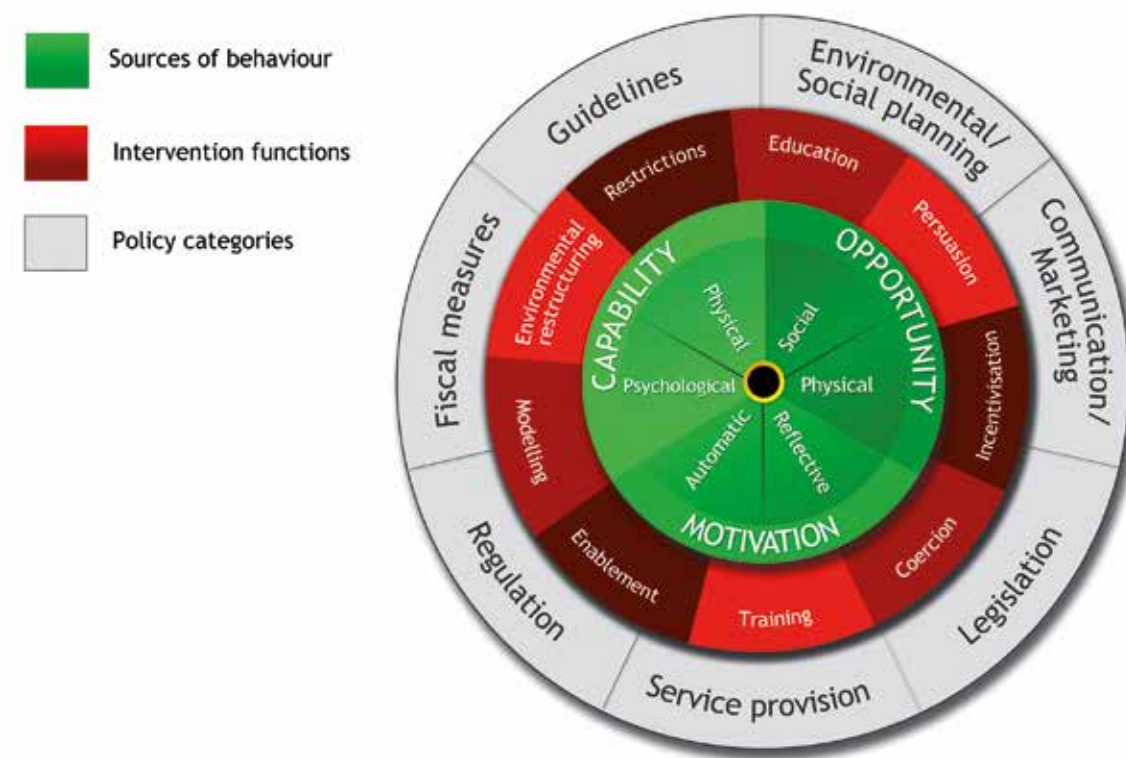


A comprehensive response to cannabis

It is clear that in order to tackle cannabis use, one cannot rely on a single intervention. Rather it requires a multi-dimensional approach which reflects the complexity of the environment in which cannabis use takes place. In order to begin to develop such an approach, an appropriate starting point would be to identify the widest possible range of interventions and policy categories which are likely to be effective in this regard. This is a useful exercise which could prevent policy makers from neglecting important options.

therefore be understood to mean the regulatory sanctions which are already in place and which may play a preventative role in drug use uptake. As the wheel demonstrates, actions which may be effective in positively influencing a person's behaviour may be implemented at various levels from a legislative level to mass media campaigns as well as to individual level interventions. The model takes into account that individual behaviour is affected by a range of environmental, social and personal factors.

Figure 6: the behaviour change wheel



As part of a review of over 1200 articles on behaviour change interventions, Michie et al (2011) developed a behaviour change wheel which could help inform both appropriate person-centred and population level interventions. Although the wheel was not designed with illicit drug use in mind, the wheel does demonstrate the different elements which may influence a person's drug-using behaviour. Regulation, in this instance, could

One potential criticism of The Behaviour Change Wheel is that it does not consider the effectiveness of the interventions. So by looking at the wheel, observers may be left with the impression that each category of intervention is equally effective. Whilst there is an emerging belief that a comprehensive strategy will yield the best overall results (Burkhart, 2012 & WHO, 2003b), it is also true that some interventions have a

stronger evidence base than others. For example, in the field of alcohol, the evidence on the effect of education, communication, training and public awareness is not as sound as the evidence base on population level measures such as increasing price, reduced availability and age limits (European Commission, 2006b). Therefore, whilst it is important to have a balance of approaches, it is also important to invest in and prioritise those with the greatest impact. To help distinguish between those drugs based interventions with a strong and weak evidence base, the EMCDDA has started to establish a prevention portal (available on the EMCDDA website), which summarises evidence on drug prevention as well as evidence-based treatment interventions.

Whilst the Behaviour Change Wheel incorporates multiple areas of intervention, the EMCDDA categorises the area of drug prevention in a different but slightly overlapping way (EMCDDA, 2011d). They consider the following approaches which help young people to adjust their behaviour, capacities and wellbeing:

- **Universal prevention:** universal strategies that address an entire population (e.g. local community, pupils, neighbourhood)
- **Selective prevention:** strategies which serve specific subpopulations whose risk of a disorder is significantly higher than average
- **Indicated prevention:** strategies which target individuals who are showing indicators that are highly correlated with an individual risk of developing drug use later in their life or who are showing early signs of problematic drug use
- **Environmental prevention:** strategies aimed at altering the immediate cultural, social, physical and economic environments in which people use drugs

If we take environmental strategies as an example, they may aim to change the environment to reduce the likelihood of drug use taking place and can include unpopular but effective components, which restrict use whilst also creating protective and normative social environments which influence young people's choice about drug use. Whilst

such strategies can be effective at a population level (EMCDDA, 2011d & European Commission, 2006b), they also need to be backed up by a whole range of other interventions which aim to train, persuade and enable people.

Unfortunately, across Europe, a comprehensive response to cannabis is not being systematically employed and few countries are investing in the wide range of interventions which are still at their disposal within a restrictive drugs framework. This has led many to assess that current drug laws are not working, as many rely totally on the laws to reduce demand, without considering the need for a more comprehensive set of responses within a restrictive drugs framework.

In a European survey carried out by the EMCDDA, it was found that:

- Intervention types that are more strongly supported by evidence (e.g. structured intervention protocols, carefully delivered peer approaches and interventions specifically for boys) were only reported by a few European countries
- Only a few European countries report interventions addressing social disadvantage (e.g. unemployment), helping with criminal justice problems or assisting marginalised families from ethnic minorities and families coping with mental health problems
- Only seven countries reported full or extensive provision of interventions targeting drug use in families
- Indicated prevention with at-risk children is rarely being achieved besides isolated examples in a few countries

Regulation of cannabis: a silver bullet?

Also highly concerning on a Member State level is the lack of services available to young people with cannabis dependency. Portrayal of cannabis as a safe and natural drug may well result in cannabis dependency not being taken seriously by policy makers and healthcare workers, resulting in a lack of services geared up to meet the needs of people who seek support. There is plenty of evidence to suggest that drug services targeting young people are still not mainstream, with some countries in Europe not even investing in a single teenage-specific drug residential rehabilitation service for those who may benefit from it (Centre for Policy Studies, 2012).

These examples demonstrate the degree to which effective drug interventions are not being employed consistently across Europe. Rather, there is still much more that could be done within a restrictive drugs framework to reduce cannabis use and harm in Europe.



Since no country has legalised cannabis, there is no empirical evidence on the effects of legalisation. However, it seems likely that experiences from the alcohol and tobacco field can provide some valuable lessons. Indeed, many drug law reformers propose that cannabis should be regulated along the same lines as other harmful substances such as alcohol and tobacco (Room et al, 2008).

Drug law reformers argue that cannabis legalisation will reduce organised crime, cut law enforcement costs, safeguard individual autonomy, ensure consistent product quality and potency and generate tax revenues. Reformers sometimes even argue that regulation would reduce availability, especially for young people, since age limits could be enforced.

Changes to youth prevalence rates

Studies indicate that there would likely be changes to prevalence rates should cannabis use be decriminalised or if a regulated market were to be introduced. It is highly likely that such changes would impact to a far greater extent on younger people than they would on adults who already have established patterns of use or non-use (Bretteville-Jensen & Williams, 2011). So, for example, adults who do not smoke cannabis may be less likely to be effected by immediate policy changes but younger people may be more likely to be influenced by the factors below:

- Increased availability of cannabis
- Perceived less risk involved in the purchase and consumption of cannabis
- Reductions in the cost of cannabis (Thomas et al, 2008; Kilmer & Caulkins, 2010)
- Marketing and advertising
- Changes of social norms with peers

It is worth noting that general population prevalence statistics may easily disguise important changes among young people. As cannabis use is concentrated in younger people, the 15-34 year group will probably be more sensitive to changes in regulation than the population as a whole. It is therefore advisable to continue to carry out rigorous youth surveys to be able to map how

youth attitudes towards cannabis change.

It is also worth noting that the long-term consequences of changing legislation on its own would probably only become clear after a long period of time. This is because one would need to follow up the youth generation who were impacted at the time of policy change through to adulthood. It is also worth considering that once an established market is in place, it would be very difficult to reverse, as one can see this from the example of the use of tobacco.

The black market

The proposal for a regulatory regime reflects a belief that control regimes do influence harm, and that stricter control will reduce use and related harm. However, it seems likely that legalisation of cannabis under a strict control regime also will have secondary costs. Legalisation does not eliminate the need to enforce regulations, nor will it eliminate the black market.

Even though alcohol and tobacco are legal, there is still a considerable black market. Estimates of illicit cigarette trade from 84 countries show that 11.6% of cigarette consumption in 2007 was illicit but studies have shown that young people are much more susceptible to using tobacco from the black market than any other age group (ASH, 2012a). This is worth noting as tobacco use is more widely spread across age ranges, whereas cannabis use is highly condensed within younger age groups (see Figure 3).

While the share of illegal tobacco in high income countries is less than 10%, in low income countries it is almost 17% and annual global revenue losses are estimated at \$40 billion (Joossens & Raw, 2011).

Whilst the tobacco industry argues that high taxes are predominantly to blame for illicit markets, international evidence suggests that this is not the case and that some countries with relatively low tobacco prices actually experience some of the highest levels of illicit activity, showing that illicit trade is more of a law and order issue than a purely pricing one (ASH, 2012b).

In terms of alcohol, we can also see similar patterns, with global illegal alcohol markets being estimated at \$4.3 billion (Havoc Scope Global Black Market Information, 2012). At the EU level, it has been estimated that 8% of alcohol consumption is illegal (Anderson & Baumberg, 2006).

Illicit trade undermines the effectiveness of taxation, (which is one of the most effective strategies to reduce consumption), reduces revenues and increases the availability of cheap cigarettes and alcohol, thus increasing consumption (Chaloupka et al, 2011 & Babor et al, 2010). Both alcohol and tobacco markets indicate that illicit trade is particularly common in less developed countries. Illegal alcohol and other unrecorded alcohol make up about one third of consumption in established markets, but much higher shares in less developed countries. For example, in East Africa around 90% of all alcohol is unrecorded (Babor et al, 2010).

Whilst high taxes may provide some demand for illicit products, analyses have shown that illicit trade is also closely linked to factors such as the risk, ease and cost of operation, punishments, corruption, tolerance of contraband sales and organisation of criminal networks in a country. Illicit markets occur in both high and low tax jurisdictions (Joossens & Raw, 2011).

Another purpose of a regulatory regime would be to establish a control system that regulates the quality and quantity of the product. Advocates of legalisation often include potency limitations as a feature of some type of regulated system. However, the efficacy of such a system has been questioned, since cannabis would still likely have a significant black market or be grown at home.

Some drug law reformers have proposed to allow small-scale home production for personal use (Room et al, 2005). It seems likely that this would weaken the incentives for a black market. However, it would also undermine the potential to control product quality and prices or to enforce potency limitations or age limits.

Age control restrictions

It is sometimes argued that illegal drugs are more available to young people than alcohol and tobacco since the illegal drug market is operated by criminals who do not care about the age of their customers. Regulation of cannabis, so this argument goes, would make it possible to enforce age limits on cannabis like on alcohol and tobacco. Whilst age controls and limits can be an effective strategy to reduce access to alcohol and tobacco, studies show that alcohol and tobacco use is still widespread among young people. The 2011 ESPAD study shows that on average 87% of 15-16 year olds in Europe have drunk alcohol, and 79% report past month use. This compares to 17% who report having used cannabis and 7% who report past month use (ESPAD, 2011).

In terms of access, a Eurobarometer study shows that 51.6% of the 15-18 age group said it would be fairly easy or very easy to get cannabis within 24 hours. However, 84% said it would be very easy or fairly easy for them to get alcohol and 82% said it would be very easy or fairly easy to get tobacco within the same time frame. Importantly, one in four 15-18 year olds found it impossible or very difficult to get cannabis compared to 2.8% for alcohol. Ease of access to cannabis was highly related to past year use. 58% of those who had used in the past year said it would be very easy to get, but this proportion dropped to 20% among those who had never used (European Commission, 2011).

The evidence above therefore suggests that despite age limits the use of alcohol and tobacco among underage youth is widespread, and both alcohol and tobacco are more easily available than cannabis. While the current drug control regime in European countries does not eliminate drug use among young people, cannabis use is consistently lower and perceived availability more restricted than for alcohol and tobacco. There is therefore nothing to suggest that a control regime like that on alcohol and tobacco would reduce cannabis use and availability among young people.

The economic costs of cannabis use

Proponents of drug law reform often argue that the current drug control regime imposes large secondary costs on society as well as on individuals (Room et al, 2008; Global Commission on Drug Policy, 2011). However, it seems likely that either the decriminalisation or legalisation of cannabis under a strict control regime also will have secondary costs, as is the case with alcohol and tobacco (licensing, local retail enforcement, illicit enforcement, trading standards, customs etc). Neither decriminalisation nor legalisation eliminates the need to enforce regulations. In terms of a decriminalised regime, cannabis would remain an administrative offence and still be treated through public service channels and the criminal black market would be left intact. Recently, the Portuguese Health Minister warned that decriminalisation had actually been more expensive than their previous strategy (Da Costa, 2012) and that decriminalisation was by no means a cheaper option than a restrictive strategy.

Changes to social and cultural norms

The purpose of drug laws is to limit the use of drugs and related problems. It is generally assumed that laws have a deterrent effect and a restricted approach is likely to influence both the availability and price of drugs (Room et al, 2008). The legal impact hypothesis states that changes in the law will lead to changes in use. Whether or not this is the case is an empirical question, albeit one that may not be so easy to answer.

A number of countries have changed drug laws regarding cannabis over the last decades. However, studies have failed to find consistent patterns between changes in drug laws and prevalence estimates (Room et al, 2008; Global Commission on Drug Policy, 2011).

In a comparison between several European countries, the EMCDDA rejects the legal impact hypothesis in its simplest form, stating that: “no simple association can be observed between legal changes and cannabis use prevalence” (EMCDDA, 2012a). Researchers point to a number of caveats when comparing data from different countries at different times. Data may not be comparable,

laws may be enforced differently, matched control locations are unavailable, results in one location may not always predict results elsewhere and policy may change over time.

Drug use is of course also not only governed by laws. Cultural factors such as habits, customs, risk perception, social norms, public acceptance and social equality also play a role. There may even be some interaction between laws and social norms, risk perceptions and acceptance; in that laws may influence public opinion and public opinion may influence laws. For example, there has been speculation that the availability of medical marijuana in Colorado may have reduced the perception of risk of cannabis, leading to an increase in both its use and public approval (American Association of Child and Adolescent Psychiatry, 2011), which may have had some role in the recent vote to legalise cannabis for recreational use in adults (although it is difficult to identify cause and consequence). Furthermore, it is also worth considering that as cannabis use is concentrated in the younger age groups, the social norms of young people may be more sensitive to changes in the law than the population as a whole.

Legalisation and regulation of cannabis would thus be ‘essentially uncharted waters’. The issue of cannabis requires a comprehensive approach which builds on the already established international treaties and which takes advantage of available evidence and experience from other public health fields. Whilst no policy may be perfect, it is clear that governments could be doing more within the already existing conventions, without investing in a risky experiment.

EURAD recommendations

Recommendations for drug policy

- ✓ Governments should opt for a comprehensive approach through evidence-based measures such as drug prevention, treatment and rehabilitation
- ✓ Governments should analyse the opportunities they have under the current drug control conventions to further reduce drug use and related harms
- ✓ Governments should carry out rigorous independent analyses of the consequences of any future drug regulation system*
- ✓ Governments should assess the extent to which drug policy changes influence social norms

Cannabis Prevention Recommendations

- ✓ Governments should invest in evidence-based prevention programmes which have been shown to both reduce the use of cannabis as well as those which delay the age of first use
- ✓ Governments should provide a combination of evidence-based universal (targeting the whole population), selective (target at risk groups such as marginalised families), indicated (targeting individuals at risk, such as those with ADHD or with behavioural disorders) and environmental drug prevention programmes (where you tackle the physical environment in which cannabis use takes place) and evaluate their success in terms of reducing use, reducing harm and delaying the age of onset of cannabis use

* Independent research should not be linked to drug policy reform groups or from researchers who have received funding from such groups

Cannabis Treatment Recommendations

- ✓ Governments should ensure that users are offered and provided with comprehensive treatment opportunities, which includes long term support
- ✓ Governments should develop effective referral routes into cannabis treatment (particularly for young people) from the education, health and justice sectors
- ✓ Governments should provide comprehensive support to tackling drug use in families

Research Recommendations

- ✓ Governments should invest in drug prevention research, ensuring that only evidence-based programmes are implemented and that findings are effectively disseminated among researchers and practitioners
- ✓ Governments should commission independent youth drug use surveys and respond to trends with appropriate evidence-based prevention and treatment programmes
- ✓ Governments should invest in research on the harms caused by drug and cannabis use both for individuals and for society (including drug driving, secondhand smoke and the impact on families and communities)

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