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EMCDDA MONOGRAPHS

A cannabis reader: global issues and
local experiences

8 VOLUME I



European Monitoring Centre
for Drugs and Drug Addiction

EMCDDA

MONOGRAPHS

A cannabis reader: global issues and local
experiences

Perspectives on cannabis controversies, treatment and
regulation in Europe

Editors

Sharon Rödner Sznitman, Börje Olsson, Robin Room

8
VOLUME I

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Introduction

Smoked, eaten, imbibed — or just talked about — it seems the world has a strong appetite for cannabis. An estimated one in five European adults have tried it. Thirteen million Europeans have consumed it in the past month. Globally, nearly 50 000 tonnes of cannabis herb or resin is produced for consumption each year. Little wonder, then, that cannabis has become a controversial cultural and commercial phenomenon. Today, cannabis has a unique ability to divide opinion among policymakers, scientists, law enforcers, drugs professionals and consumers.

This EMCDDA cannabis monograph addresses one basic question. *How can I find quality information on cannabis, amid all the bias and opinion?* During the editing of this monograph it soon became clear that the EMCDDA was entering an area crowded with general guides, even competing cannabis monographs. This is where the idea of a cannabis ‘reader’ emerged. Our audience — researchers, parliamentarians, drugs professionals, students, European citizens — is currently faced with an overload of professional publications. Added to this is the daily flood of information on the Internet, often crusading in nature, and sometimes misleading. This threatens to obscure the genuine progress made in cannabis research during the past two decades.

The EMCDDA cannabis reader underlines the point that cannabis is not just a static, unchanging plant, but a dynamic product that is subject to gradual evolution in potency, prevalence, cultivation, legislative and public health concerns. In this monograph, leading experts provide short, sharp insights on a range of cannabis topics while offering advice on further reading for each topic. Brief editorial notes provide concise introductions to each topic, occasionally drawing attention to political sensitivities and the need for a ‘critical eye’. So this cannabis reader has a value, both as a shortcut to researchers entering the area and a synthesis for experts.

You will find a wide range of views expressed in the chapters in this monograph, not all of them in agreement. The arguments, tone and conclusion of each chapter is the responsibility of the author alone, and is not necessarily endorsed or supported by the EMCDDA. This reflects the wider discourse on cannabis where different positions and perspectives often lead to different conclusions being drawn from the same evidence. We believe each chapter represents a useful contribution to the overall debate, even if their individual perspectives differ.

Two volumes, multiple audiences: policymakers, enforcers, researchers, professionals

The monograph is divided into two volumes, each comprising three sections. There are a number of reasons for the two-volume approach. While complementary, each has a slightly different audience. The first volume centres on political, legislative, commercial and social developments relating to cannabis. Its core audience thus comprises policymakers, sociologists, historians, journalists and those involved in enforcement. The second volume is very much centred on drugs professionals working in the fields of treatment, prevention and healthcare.

Volume 1

- Cannabis in the past
- Policies, legislation and control strategies
- Supply and production issues

Volume 2

- Epidemiology
- Health effects of cannabis use
- Prevention and treatment

Changing perspectives: from global issues to local experiences

What unites both volumes is an attempt to fuse general chapters with specific case studies. Within each section, you will encounter a progression from a 'top level' to a 'close-up' view of the subject. So each section begins with chapters providing a general introduction to a single cannabis issue, often of an encyclopaedic nature, together with a summary of the current state of scientific research. The monograph then 'zooms in' with a case study about a specific aspect of cannabis.

In Volume 1 ...

In Volume 1 we can read an autobiographical article on events in the United Kingdom in the late 1960s, recent cannabis developments in the EU's new Member States, the cannabis resin trade linking Morocco to northern Europe, the closure of Pusher Street in the Copenhagen commune of Christiania, and information on how coffee shops developed in the Netherlands. While these articles focus only on smaller pieces of the cannabis puzzle, they provide insights into the many different ways Europe has dealt with cannabis.

Foreword

Cannabis is Europe's most-consumed illicit drug. An estimated 13.4 million European adults have used cannabis in the last month. Cannabis also supports a multibillion euro market across the EU, with the share of cannabis resin in many markets losing ground to herbal cannabis. Moreover, treatment demand for cannabis use is rising in many Member States. Such facts underline the importance of having a clear understanding of what is known about cannabis in Europe, for example its impact on public health, how cannabis controls are enforced and the implications of cannabis use for public health responses.

Cannabis is also, perhaps, Europe's most heavily debated illicit drug. Reviews of the health effects and legal status of cannabis have been carried out by numerous governments and agencies over recent decades. And there is frequent, sometimes heated, discussion about cannabis in the political arena, amongst others in relation to mental health problems, the therapeutic potential of cannabinoids, policing and enforcement, legislation and sentencing.

So it is with great pleasure that I introduce this important body of work on cannabis. It is the most comprehensive publication the EMCDDA has ever produced, and the first time the Centre has attempted to review a single substance in such an all-encompassing way. We must extend our gratitude to all authors who have contributed to this monograph. Excellent work was carried out by Sorad in Sweden, together with reviewers from the EMCDDA's Scientific Committee, and two independent scientific editors, John Witton and Wendy Swift. The result is a 'cannabis reader': a genuine navigational aid to research, debate and policy-making on the substance. The reader approaches cannabis from many angles, and will appeal to a wide audience, ranging from 'beginners' approaching the subject from other disciplines to drug researchers and professionals who are familiar with the literature and who may appreciate some synthesis of the state-of-the-art in current research or practice.

A cannabis 'reader'

While cannabis is the most consumed illicit drug worldwide, politically cannabis is a great divider. The illegality of the drug means that the evidence base is often patchy. Lobbyists, libertarians, prohibitionists, think-tanks and commercial interests all by definition speak to the issue from divergent positions. Even research in this area can sometimes appear to be influenced by a political as well as a scientific agenda. The information base in this area is considerable and this fact alone poses a serious challenge to any reader who attempts to navigate it. The goal of this publication is to

gather knowledge that will provide a base for improved policy approaches to cannabis in the future. In reaching this goal, leading experts have been asked to clarify what is known and what is not known about cannabis; on which issues scientists agree and which issues are still under debate.

In the development of the monograph the EMCDDA has been keen to provide a non-judgemental, non-partisan approach to the evidence. However, our aim has also been to enable each author's ideas to be fully expressed. As leading experts in the field, they are qualified to make judgements where they feel fit, and while most of the monograph is analytical and descriptive, the nature of the subject matter means that, in places, opinions and views are expressed which may be perceived as controversial. Not all the views expressed here are in agreement.

Chapters have been peer-reviewed by the EMCDDA's Scientific Committee and further edited by qualified scientific editors. The EMCDDA has introduced each chapter, and where opinions are expressed, references to counter-arguments are given, together with a reading list, for those seeking to explore the subject further. Authors have also been given the opportunity to adapt their chapters based on peer feedback. Nonetheless, the chapters remain very much the work of the respective authors. They should be read with the proviso that any views expressed should neither be considered those of the EMCDDA nor the EU institutions in relation to cannabis.

Maximising the shelf-life of the monograph

One of the challenges with working on illicit drugs is that the field is in constant evolution. Use patterns and prevalence, use context and even routes of administration and potency of product can change substantially over time. This is particularly the case for a drug like cannabis, where our understanding of the public health impact of the use of the drug is growing almost daily. Another example of this difficulty is the field of medicinal cannabis, where a number of new medicines are currently being developed in various parts of the world, with considerable uncertainty as to the scope and range of potential therapeutic applications.

What is certain is that this will not be the last monograph published on cannabis. There is a publication cycle of one governmental or think-tank monograph on cannabis every few weeks, and this is likely to continue. Around 20 major books on cannabis are produced by commercial publishers each year, in different languages, with many more in the specialised and scientific literature. So the first volume of the monograph includes an Appendix that sketches a brief history of cannabis monographs and grey literature, referring to the large range of monographs on cannabis. The EMCDDA monograph hopes to (i) identify the producers of literature on cannabis, (ii) illustrate the range in

thematic focus of publications and (iii) provide a one-stop research resource for recent major publications on cannabis. This Appendix will reside in a more dynamic form on our website. We hope it will provide an important stepping stone to information on cannabis, published at national, European and global levels.

What this reader adds to the literature

Each chapter is preceded by a section entitled ‘Setting the context’. These are provided to guide readers through the monograph, to offer suggestions for further reading, and to draw attention to the cycles of reporting on cannabis — often annual — by organisations such as the UNODC, the EMCDDA and our Reitox National focal points.

Readers will be interested in knowing what they will gain from this publication. The first is the multidimensional approach to the subject matter. It describes cannabis as seen from different perspectives: historical and cultural, pharmacological, sociological, legal and policy-related, and treatment- and practitioner-related. The second is the monograph’s supranational and European focus. While numerous cannabis monographs have been written at a national or multilateral level in Europe in the past decade, this one can claim EU-wide relevance. It is backed by the EMCDDA’s epidemiological statistics, based on reporting from the Reitox network and the Centre’s privileged position of being able to select a strong team of authors for the monograph. Thirdly, the monograph reflects emerging trends, for example in legislative approaches, treatment demand and provision and cannabis potency.

We hope you will appreciate the effort invested in this monograph. It provides a step back from the EMCDDA’s annual monitoring activities. This wider perspective is both refreshing and eye-opening, even to those of us who are seasoned experts in the field.

Wolfgang Götz
Director, EMCDDA

Overview of Volume 1

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- 2 The re-emergence of the therapeutic use of cannabis products: recent developments and future prospects
John Witton
- 3 The pharmacology of cannabis: issues for understanding its use
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Jacek Moskalewicz, Airi-Alina Allaste, Zsolt Demetrovics, Danica Klempova and Janusz Sierostawski with Ladislav Csemy, Vito Flaker, Neoklis Georgiades, Anna Girard, Vera Grebenc, Ernestas Jasaitis, Ines Kvaternik Jenko, Richard Muscat, Marcis Trapencieris, Sharon Vella and Alenka Žagar

Our understanding of cannabis today is bound up in an understanding of the past. We begin this monograph by looking back on how cannabis was used and understood in the past. Throughout human history, cannabis has been used for many purposes such as recreation, therapy, art, religion, medicine and as a textile.

The first two chapters in this section examine the role of cannabis as a medicine in Europe in the 19th century, together with more recent developments in developing cannabis as a medicine. In the past two decades, great efforts have been made to assess the usefulness of cannabis as medicine, as cannabis is currently being used in a small way as medicine. Nevertheless, the role cannabis plays in medicine today is modest compared with the past, and although there are reviews on the subject, well-established and secure conclusions of the extent to which cannabis is a reliable and useful medicine remain uncertain. Many have pointed out that there is a need for further research on the subject.

Moving on from a historical and contemporary perspective on cannabis as medicine, a general introduction to the pharmacology of cannabis is also presented. Although the psychoactive effects of cannabinoids have long been known, it was not until the 1980s that the first evidence for the manner in which tetrahydrocannabinol (THC) acts on the brain became known and, as Corrigan's chapter highlights, important advances have been made since then.

This section proceeds to focus on two case studies that discuss the role of cannabis in youth cultures in the 1960s. As Abrams and Olsson show, cannabis became widely known as a recreational drug with the youth cultures of the 1960s. Government responses to the increased use of cannabis were probably as much concerned with a response to the youth cultures as they were a response to the substance use in its own right.

The section ends with development in the more recent past: the enlargement of the European Union in 2005, to embrace 10 countries in Eastern Europe, the Baltic States and the Mediterranean Islands. This round of enlargement is an event that remains fresh in the minds of those who will read this monograph in Europe. Yet with the subsequent addition of Bulgaria and Romania, and the welcoming of new candidate countries, these Member States are beginning to become more firmly integrated within the fabric of the EU. Time will tell whether the large variations currently seen in cannabis use across these countries will evolve to reflect those in pre-2005 Member States.

The different chapters included in this section constitute only a limited presentation of cannabis in the past. Nevertheless, we hope that the section facilitates the beginning of an understanding of present-day processes. As people living in contemporary society with contemporary concerns, we sometimes neglect the importance of the past. We hope that these introductory chapters illuminate that although much of this monograph is based on up-to-date data, our understanding of cannabis today is partly a product of its past.

Part II: Policies, legislation and control strategies

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11 Cannabis: a harm reduction perspective

Andrew Bennett

There are three main UN drug conventions, two of which are significant for cannabis. The 1961 Single Convention on Narcotic Drugs provides for controls over cannabis, as well as other drugs. The 1988 Convention Against Illegal Traffic in Narcotic Drugs and Psychotropic Substances strengthened the international scope and framework of cooperation against drug trafficking, including trafficking in cannabis. All EU members are signatories of the three UN conventions on illicit drugs, and the EU itself is a signatory of the 1988 Convention. Consequently, all countries within the EU have adopted some sort of legal prohibition against cannabis, and the UN conventions have played a role in constraining national legal experimentation on drug law and policies. The international UN conventions on drugs are unique. There is no other issue where one can find a universalised discourse translated into such similar legislation around the world.

Nevertheless, and as made apparent in this section, the appearance of harmony in the EU is to a large extent not a reality. Wide room for manoeuvre within illicit drug legislation has been taken within the EU. Individual national legislation is possible despite the UN conventions, as treaties allow for discretion. Additionally, national variations in drug use policies are accommodated within the EU organisational structure. Although the EU has launched several drug action plans, full harmonisation has not materialised. And though the EU takes complementary measures, there is no coherent holistic approach to drug issues in the EU. The EU considers drugs to be mainly an internal security concern. This implies that there is little overarching influence from the EU on national drug policies. Individual countries are relatively free to experiment with different drug-related policy regimes. Especially prominent is the case of cannabis liberalisation policies, explored by Ballotta et al. in this section. The chapter makes evident that many EU Member States have gone their own way in terms of how to interpret the UN global control regime on cannabis.

The different approaches to cannabis-related issues are often discussed in terms of a philosophical shift between zero tolerance approaches and harm reduction approaches, or in terms of criminalisation and decriminalisation or repressive versus liberal regimes. This is, however, too simplistic a notion of the issue at hand. Clearly, as shown in Ballotta et al.'s chapter, there exist multiple approaches to legislation regarding cannabis within the European Union today, and specific legislative categories are often difficult to determine. The Netherlands, for instance, which is often thought of as a liberal regime, is still a prohibitionist country. The Netherlands uses roughly two-thirds

of its budget for drug problems on criminal action. As noted in Korf's chapter, although possession for personal use and use of cannabis is decriminalised in the Netherlands, production and supply of cannabis are prohibited, and criminal sanctions are enforced. Seen from this perspective, it might be informative to think of the various issues related to cannabis control as continuous and blurred, rather than a case of dichotomy of liberal or repressive.

In terms of the effectiveness of the various cannabis policies which exist in the EU, evidence is scarce. As Room points out, the drug field has much to learn from the tobacco and alcohol fields, in which policy measures are more rigorously examined and there is a relatively well-developed evidence base on which strategies work and which are most effective in terms of reducing the harms. In comparison, the policy impact literature is relatively undeveloped with respect to illicit drug use. Indeed, different drug control regimes are rarely rigorously evaluated. Despite scarce evidence, a modest research literature exists which remains sceptical about the effectiveness of cannabis prohibition. Korf suggests, for instance, that cannabis possession laws have little influence on cannabis prevalence rates and are thereby not an effective way to deter use.

It is also generally agreed that there is a gap between formal policies and policy as implemented. As is shown by Ballotta et al., the most common penalties for cannabis possession range from fine to incarceration. Nevertheless, reports suggest that in practice most detections lead to a fine. Additionally, evidence of a 'net widening effect' exists. Researchers have noted that a relaxation of policies may not have the intended effect of less severe consequences of cannabis prosecution. Some have suggested, for instance, that cannabis reclassification in the UK might have led to offenders that were previously dealt with informally being subject to on-the-spot formal warnings, recorded as such by the police force. Since there are few long-term data on cannabis policies as implemented and the effects they have, it is difficult to determine the impact of 'decriminalisation' policies.

Researchers generally agree that the harm to the defendant in drug cases extends far beyond the cost of the actual criminal justice sentence or caution. Exactly what the impact of a cannabis prosecution entails is, however, far from clear. Administrative measures do not necessarily mean a more gentle approach than criminal measures, as administrative measures might be associated with additional costs for the individual user, for instance through a reduction or withdrawal of a student's loan or difficulties in employment opportunities. While evidence of this is available in the literature for the US and Australia, little evidence exists for European countries.

Harm reduction policies, as mentioned by Bennett, start from a recognition that substance use has been and will continue to be part of human experience. Acceptance

of this fact leads harm reduction approaches to develop strategies with the aim of moving people towards safer forms of substance use, possibly with abstinence as the ideal. In this way harm reduction is a radical move away from more traditional illicit drug strategies that solely aim at abstinence. Another distinct feature of harm reduction is its emphasis on respecting drug users and on moving away from paternalistic models of care.

A strength of harm reduction strategies is the firm focus on secondary as well as primary harms of cannabis use. In addition to the attempt to reduce primary and adverse health effects of cannabis use, harm reduction strategies recognise that harm also arises as a consequence of legislation, policies and police strategies. Unfortunately, the secondary harms are far less researched than the primary harms of cannabis use, and this poses a challenge for future research efforts. Indeed, and as pointed out already, the current evidence base on the impact of drug policy regimes is weak. In order to learn more about the relation between policies and effects, there is a need for carefully designed studies that are able to determine the impacts, primary and secondary, of cannabis use. The most appropriate way to go about such work is through quasi-experimental designs, and where possible true experiments.

One criticism of harm reduction strategies has been that it sends out the ‘wrong’ messages. This claim can be countered by a variety of responses, for example, that public health approaches in other fields such as sex education have adopted a harm reduction approach, that the community understands harm reduction messages, and that they are not an encouragement to use drugs. But symbolic values can be as important as evidence and the emphasis on symbolic values might be a useful starting point for reaching an understanding of how cannabis policies have developed and how they may develop in the near future.

What the future holds in terms of drug law harmonisation is, however, impossible to predict. What is clear is that a possible harmonisation, if occurring at all, is likely to be very slow, and national and regional distinctions within the EU in terms of cannabis policies are likely to continue to be the rule rather than the exception.

Part III: Supply and production issues

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Leif Lenke

The market

Current research shows that the main supplier of cannabis to the EU is Morocco. This claim is based to a great extent on research efforts made by the United Nations Office on Drugs and Crime (UNODC), as shown by Pietschmann and Leggett. Gamella and Jiménez Rodrigo have provided an in-depth analysis of the cannabis trade from Morocco to Europe. As they point out, hashish is generally taken from Morocco to Spain and Portugal and is thereafter exported across Europe. This should come as no surprise in view of the geographical location of the countries. It must, however, also be noted that cannabis on the European market travels through other routes as well.

Although it is clear that Morocco plays an important role in the European cannabis market, it must not be forgotten that there are other significant supply sources of cannabis. As is mentioned by Pietschmann and Leggett, cannabis in Europe also derives from Thailand, Afghanistan and Pakistan. Various central Asian states and former parts of the Soviet Union are also suppliers of cannabis resin to the European market. This suggests that there is a strong correlation between poverty and the drug trade. In a poor region such as Morocco, cannabis production constitutes an important means for families to reach a sustainable standard of living.

It should also be highlighted that over the last decade, domestic cultivation of cannabis has started to change the shape of the cannabis market, so that home cultivation has in some countries become an important part of the cannabis supply. The Netherlands has long been known to be a producer of marijuana, or ‘netherweed’. Netherweed is produced for domestic as well as international consumption, and in the last few years ‘netherweed’ has been seized in the UK, Scandinavia, Germany, Belgium and France. New evidence also indicates that the supply of cannabis produced elsewhere in Europe is on the rise. Switzerland has, for instance, reported a sharp increase in illegal cannabis cultivation. A 1999 Swiss EKDT report argued that in 1998 more than 100 tonnes of cannabis were harvested for the drug trade, and it was plausible that Switzerland became the second largest European exporting country after the Netherlands. An

increase in domestic cultivation has also been noted in the UK, with some arguing that cannabis cultivated in England and Wales may now make up well over half of the consumption there.

Owing to the illegality of cannabis, both use and trade are mostly hidden. Carpentier et al. demonstrate a certain degree of uncertainty when it comes to measuring and researching the cannabis market. One can never really know if seizures are indications of general trends or of the extent of law enforcement. The trend of an increase in domestically grown *sinsemilla* at the European level is possible, but currently relatively undocumented. While international trafficking, mainly from Morocco, evidently occurs, it is unclear what share of the market home-produced cannabis actually comprises. Although much domestic cannabis cultivation is small-scale production for personal use, it should not be neglected, as it contributes to the European cannabis market and it might make up a larger proportion in the future. Seen from this perspective, although continued attention to Morocco and other international suppliers is important, there is a need for more research on domestic cultivation. Too strong a focus on Morocco may indeed produce a partly distorted picture of the European cannabis market today.

If cannabis production is to an increasing extent produced on European soil this raises new and important questions. Apart from the issue of THC potency, as discussed above, a geographical change in the production of cannabis is also connected to questions regarding the relationship between the industrial and the developing world. As Gamella and Jiménez Rodrigo point out, the cannabis market is an important economic asset to poor farmers in Morocco. A possible turnover of the market, with a shift of production to Europe, may have negative implications for peasant farmers in the developing world. Further, European domestic cultivation has implications for national criminal justice responses. At the moment heated debates regarding cannabis are usually confined to the issue of possession and not cultivation. As the geographical production of cannabis changes it might, however, also change the focus of the public debate towards more emphasis on appropriate responses to cultivation. Indeed, EU Member States might increasingly have to deal with criminal justice issues such as cultivation for personal use, and commercial cultivation, as well as medical growers. We might expect new policy initiatives, and with these a need for scientific investigation into how the market is evolving and how it responds to new developments.

Potency

From time to time, a wave of media interest across Europe contends that cannabis in contemporary society is stronger and thus more harmful than it was in the 1960s and 1970s. Claims have been made that cannabis consumed today is 30% stronger than in the past. This belief, though strongly held, is something of an urban myth. As King in

this section notes, the myth has been fuelled by media and politicians, and researchers have suggested that the figures come from misinterpretation of the data which, when calculated in accurate terms, actually translate to a 1% increase.

Clearly, there are controversies concerning cannabis potency, and in-depth and careful investigation is required in order to explore properly the issue of THC potency. King investigates data from seven European countries. When using potency data combined with data on resin and herbal cannabis consumption, a weighed mean potency is found. Following this strategy, King finds a potency increase only in the Netherlands and he thus concludes that no overall upward trend is found except from indoor-cultivated Dutch resin, which is thought to make up a small share of the market. But despite King's reassurance that overall cannabis potency has not increased dramatically, there is evidence which challenges this view. This is, for instance, pointed out by Leggett and Pietschmann in this section, who point towards a possible trend for indoor domestic cultivation of sinsemilla to increase in several European countries. Claims have been made that this type of cannabis is easily modified and does often imply an increase in potency. At present the size of the European domestically produced cannabis market is, however, unclear. Additionally, it is unclear to what extent domestic production actually implies an increase in cannabis potency.

Clearly, contradictions prevail, and we may conclude that at present it is difficult to gain adequate data on the issue of trends in cannabis potency. Forensic data provide only a weak basis for evaluating potency trends, largely due to problems associated with standardising definitions of cannabis products and sampling issues. Additionally, analysis based on drug enforcement seizures may be anomalous in a number of ways, including a disproportionate focus on large cultivators and seizures. Finally, it is evident that the discussion has been contaminated by scare tactics and ignoring of sound evidence. Thus, there is clearly a need to pursue these issues further in order to create an improved knowledge base from which the potency issue may be further explored and better understood.

In order to facilitate an informed policy debate, there is also a need to explore issues indirectly linked to the issue of THC potency, for instance, to investigate adverse short- and long-term health effects that might arise from a potential increase in potency. Indeed, as pointed out by King, THC potency increase does not necessarily mean that there will be an increase in adverse health effects, as an increase in potency may lead to an adaptation by the users to smoke less cannabis. In turn this would lead to less inhaled smoke in lungs and thus decreased risk of respiratory diseases.

Knowledge of potency as well as the dose consumed by individual users is an important and sometimes neglected area in the research literature. As is well accepted in the alcohol and tobacco field, the effects of cannabis must be considered in relation to type

of cannabis consumed, and pattern of consumption, and hence also THC levels. There is little disagreement that there is a difference between drinking a full glass of vodka and a full glass of wine and that intense, prolonged use of alcohol is deleterious to both physical and psychological well-being. In the case of cannabis, on the other hand, there seems to be little effort made to ascertain actual dose rates and hence lifetime intake of cannabinoids. Thus, little account is taken of the wide range of concentrations of THC and related compounds in smoked cannabis and differences of smoking habits from one individual to another. This poses a challenge for future research.

Sharon Rödner Sznitman

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Cannabis in the past

PART I



Chapter 1

Cannabis as medicine in Europe in the 19th century

Keywords: cannabis – history – medicine – medicinal use – pharmaceutical use – pharmacy

Setting the context

Cannabis has been the subject in recent years of substantial historical study. Overviews include Abel (1980), Grinspoon and Bakalar (1993), Mathre (1997), Sloman (1998), Matthews (1998, revised 2003), Rättsch (2001), Grotenhermen (2002), Wujastyk (2002), Green (2002), Booth (2003), Allegret (2006) and Russo (2007).

This explosion in historical interest is firmly rooted in the present. Reasons for this interest include: a wider vogue in historical publishing towards single product histories (cod, salt, opium, etc.); advocates of medicinal cannabis research and the hemp industry seeking historical legitimacy and lineage; cannabis use among the middle-aged (the core audience for history of any kind); cannabis' emergence as a legislative hot potato; lively debate among botanists on the classification of *Cannabis sativa* ⁽¹⁾; not to mention the explosion of both encyclopaedic texts and drugs-related historical source documents on the Internet. Cannabis has even evolved to have its own portal on *Wikipedia*.

Rather than retread the all-encompassing historical scope of such studies, this chapter provides a focused view of how cannabis aroused interest among pharmacists in Europe. It also provides brief reflections on the contemporary revival in research into medical applications of cannabis over the past two decades. Analogies can be drawn with today's cannabis debate: for example, European experience of far-flung cultures — the past's Napoleonic soldiers in Egypt, today's backpackers in Thailand and

⁽¹⁾ See Watts, G. (2006), 'Science commentary: cannabis confusions', in *British Medical Journal* 332: 175–176 (available at: www.bmj.com/cgi/reprint/332/7534/175.pdf).

Morocco; availability of information — the past's national botanic encyclopaedias and pharmacopoeia, today's cannabis discussion forums and online growguides.

This chapter remains historical in scope. While mentioning recent developments, it does not explore in detail current developments in medicinal cannabis. However, a short chapter has been added by John Witton, providing a summary of recent developments in medicinal cannabis.

Further reading

Histories

- Abel, E. L. (1980), *Marihuana: the first twelve thousand years*, Plenum Press, New York
www.druglibrary.org/Schaffer/hemp/history/first12000/abel.htm
- Allegret, S. (2006), 'Histoire du chanvre', in P. Boulloc (ed.), *Le Chanvre industriel — production et utilisation*, Editions France agricole, Paris.
- Booth, M. (2003), *Cannabis: a history*, Doubleday, London.
- Green, J. (2002), *Cannabis*, Pavilion, London.
- Grinspoon, L., Bakalar, J. B. (1993), *Marihuana, the forbidden medicine*, Yale University Press, New Haven.
- Rätsch, C. (2001), *Marijuana medicine: a world tour of the healing and visionary powers of cannabis*, Healing Arts Press, Rochester.
- Russo, E. (2007), 'History of cannabis and its preparations in saga, science, and sobriquet', *Chemistry and Biodiversity*, 4: 1614–1646.
- Sloman, L. (1998), *Reefer madness: a history of marijuana*, St. Martin's Press, New York.
- Zuardi, A. (2006), 'History of cannabis as a medicine: a review', *Revista Brasileira de Psiquiatria*, 28: 153–157.

For primary historical materials, a bibliography of historical mentions of cannabis was compiled in 1951 in two volumes of the United Nations' *Bulletin on Narcotics* ⁽²⁾.

See also the grey literature list in the Appendix to Volume 1 of this monograph (p.300).

⁽²⁾ United Nations (1951), *Bulletin on narcotic drugs* (available at: www.unodc.org/unodc/en/bulletin/bulletin_1951-01-01_1_page007.html (accessed 11 October 2007)).

Cannabis as medicine in Europe in the 19th century

Manfred Fankhauser

As in the previous centuries, hemp was predominantly used in the 19th century as a fibre material. Herbal cannabis played a marginal role as a medicinal plant, although its seeds were used medicinally, mostly in the form of pressed oils or hemp milk as medicine against gonorrhoea or cystitis. In tandem with prevailing interest in plants, products and culture from the Orient, medicinal use of cannabis arrived in Europe from the East during the 18th century.

Much has been written on the historical knowledge in Europe of the psychoactive properties of hemp prior to the 18th century: among readers of Herodotus' description of Scythian cannabis-incensed burial rites; by alchemists, in particular the herb *Pantagruelion* lauded by author François Rabelais; via knowledge of Islamic medicine via al-Andalus, and elsewhere (Bennett et al., 1995; Booth, 2003; Mercuri et al., 2002). However, widespread scientific writings on its psychoactive properties came later. For example, Gmelin wrote in 1777 of the Eastern use of *bhang* for stupefying ('etwas Betauebendes'), mind-clouding ('Benebelung des Verstandes') and intoxicating effects (Fankhauser, 2002); and in 1786 the Comte d'Angiviller thanked a certain Boulogne for his sending of Indian hemp plants with the prophetic words '*Cette plante sera peut-être un présent intéressant pour l'Europe*'. At the end of the 18th century, the French naturalist Sonnerat informed Lamarck's 1873 *Encyclopédique de botanique* of *Cannabis indica* (Emboden, 1974) and brought Indian hemp home to France after a journey to the Orient. Napoleonic campaigns in Egypt and the Near East introduced colonial troops — notably the scientists Silvestre de Sacy, Rouyer and Desgenettes — to hashish (Abel, 1980; Booth, 2003).

European interest in this 'new', or rather rediscovered, plant grew only hesitantly. The first comprehensive description of the medical usefulness of Indian hemp in Europe was written in 1830 by the German pharmacist and botanist Friedrich Ludwig Nees von Esenbeck. Until that point in time, use of hemp for medical purposes had remained at a low level. This situation changed significantly prior to the middle of the 19th century. William B. O'Shaughnessy (1809–1889/90), an Irish medical doctor stationed in Calcutta, India, published in 1839 a comprehensive study on Indian hemp. Thanks mainly to his *On the Preparations of the Indian Hemp or Gunjah, Cannabis indica* now also became recognised within European-school medicine. O'Shaughnessy used various hemp compounds in his investigations, partly with great success, against the following indications: rheumatism, rabies, cholera, tetanus, convulsions and delirium tremens. With hashish he had found a well-suited medicine to give his patients relief, and in the

case of cramps, even total disappearance of symptoms. For concluding remarks, he wrote: 'The presented cases are a summary of my experience with cannabis indica, and I believe that this medicine is an anticonvulsivum of great value' (O'Shaughnessy, 1839).

Europe reacted promptly to this new knowledge from India. This is not surprising as until then no adequate treatment existed against recognised diseases such as rabies, cholera or tetanus. Great hopes were based on O'Shaughnessy's results. The French were the first to engage themselves intensively with the plant. As early as 1840, the French medical doctor Louis Aubert-Roche (1809–1874), who resided in Egypt, used hashish seemingly successfully against pestilence (Hirsch, 1884–1886). Nearly simultaneously, his compatriot and friend, the psychiatrist Jaques Joseph Moreau de Tours (1804–1884), began to experiment with hashish. He started out with experimenting upon doves and hares, giving them large doses of hashish extracts with their fodder. Then he tested hashish on friends, colleagues, patients and himself. He was convinced that hashish was the supreme medicament for use in psychiatry. His book, *Du Hachich et de l'aliénation mentale* (1845), caused a great sensation at the time, and is still understood as the origin of experimental psychiatry and psychopharmacology (Weber, 1971).

The works of Moreau de Tours had an impact not only in medical circles, but also among writers and artists. The poet Théophile Gauthier (1811–1872), for instance, received hashish samples from Moreau de Tours. In 1843 he described extensively a self-experienced hashish intoxication in the Paris newspaper *La Presse* under the title 'Le Club des Hachichins'. The club of hashish eaters, of which Gauthier was one of the founders, had regular meetings in Hôtel Pimodan on the Seine island of St Louis. He and Charles Baudelaire (1821–1867) shared a penthouse in the hotel for several years. Other prominent club members were Alexandre Dumas (1802–1870) and Honoré Daumier (1808–1879) (Moreau, 1904). Further well-known contemporaries such as Honoré de Balzac (1799–1850), Gustave Flaubert (1821–1880) and Victor Hugo (1802–1885) participated occasionally (Behr, 1982).

Inspired by Moreau de Tours and later by pharmacy professor Eugène Soubeiran (1797–1859), the pharmacist Edmond de Courtive published in 1848 his widely noted dissertation, *Haschisch*. In addition to chemical analysis, he carried out self-experiments with miscellaneous hashish compounds and gave exact descriptions of their physical and psychic effects (De Courtive, 1848).

Many medical doctors took advantage of the promising results of the pioneers O'Shaughnessy, Aubert-Roche and Moreau de Tours and used these new drugs for therapeutic purposes. Initially, primarily doctors from the colonial powers of England and France showed interest in the use of compounds made of Indian hemp. The necessary commodities or compounds were imported in great quantities to Europe from the colonies, especially from India (Smith and Smith, 1847). Hemp was in this period sold to Europe primarily in three commercial variations:

- *Ganjah*: consists solely of the blooming tips of the female, carefully cultivated plant. Mostly 24 blooming tips are bundled in a length of approximately 1 m, and 11 cm thickness.
- *Charras*: consists of the resin, which is extracted foremost from the blossom, but also from leaves and stalks of the female plant. Today, the extracted resin is called hashish.
- *Bhang*: extracted from the leafless stalks of the female hemp plant. Bhang was predominantly exported to Europe in powder form.

In Europe *ganjah* was the first to be pharmaceutically exploited. Initially, the fields of application known to O'Shaughnessy were adopted. Later on, the therapeutic application of hashish was considerably extended. In particular, the English and French medics applied this new wonder drug against tetanus (Martius, 1844). Encouraged by many positive reports, especially from England, the Bulgarian medic Basilus Beron intensively engaged in this problem in a dissertation. His work concludes:

I was so contented that, after having used almost all known antitetanic drugs without result, the sick person that had been assigned to me was totally cured after use of the Indian hemp (...) wherefore the Indian hemp is strongly recommended against tetanus.

(Beron, 1852)

Homeopathy, founded by Samuel Hahnemann (1755–1843) and rapidly advancing in this period, was also quick to include Indian hemp in its medical catalogue. Towards the middle of the 19th century, in addition to the illnesses already mentioned, Indian hemp was mainly used against neuralgia and other pains, chorea, hysteria, insanity, haemorrhage and insomnia. Since prepared products did not yet exist, cannabis extracts and tinctures were mostly used.

The real success story of cannabis as a medicine began in the second half of the 19th century after the publication of Beron's dissertation in 1852. In the same year, Franz von Kobylanski published a dissertation on the effect of cannabis as an oxytotic (1852). Four years later, the German Georg Martius wrote his comprehensive work *Pharmakognostisch-chemische Studien über den Hanf*, which attracted much attention. Interest was also aroused by the experiments of the Viennese Carl Damian Ritter von Schroff (1802–1887). Martius was among the few who did not deem cannabis compounds as harmless. He wrote that:

the Indian hemp and all its compounds show great diversity concerning the degree and type of effect according to individual differences in healthy as well as in pathological conditions. It therefore belongs to the unsafe agents, and the medic should under all circumstances use it with great care.

(Von Schorff, 1858)

At the same time, Ernst Freiherr von Bibra (1806–1878) published his standard work, *Die narkotischen Genussmittel und der Mensch*. Here, he discussed hashish for over 30 pages. In addition to experiences of others, he describes a self-experiment with hashish. His concluding judgement was as follows: ‘Recent experiments and experiences made on the medical effect of the hemp plant and its compounds very much point to their advantage’ (von Bibra, 1855).

In this period, most European countries, as well as the USA, included Indian hemp in their national pharmacopoeia. The monographs *Herba Cannabis indicae*, *Tinctura Cannabis indicae* and *Extractum Cannabis indicae* enjoyed increased prominence, whereas *Semen/Fructus Cannabis* and *Oleum Cannabis* became more and more rare. It was first of all France and England, and to a lesser extent the USA, that significantly contributed to the definitive breakthrough of the drug into Western medicine.

The study of Indian hemp was even pursued in Germany. A comprehensive work of Bernhard Frommüller, written in 1869, is frequently cited. He had studied the qualities of the hemp plant for a long time, and carried out cannabis experiments within the framework of ‘clinical studies on the euthanising effect of the narcotic drugs’ with exactly 1 000 test patients. These test patients suffered from heavy insomnia due to various illnesses. The results of his investigation were positive. Thus, he concluded in his work: ‘The Indian hemp is, among the known anaesthetic drugs, the narcosis which most perfectly achieves a replacement of natural sleep, without particular repression of expulsions, without bad repercussions, without paralyses’ (Frommüller, 1869).

Well-known medical experts or pharmacologists of the time wrote more-or-less comprehensive essays on *Cannabis indica*. Some of these articles criticise the unreliability of hemp compounds. Indeed, the standardisation problem continued to be an issue for cannabis compounds until they disappeared. Kobert is one of very few who discussed the dangers of long-term consumption: ‘The habitual consumption of any effective hemp compound deprives the human being and brings him to a mental institution’ (Kobert, 1897).

The period 1880 to 1900 can be considered a peak in the medical use of cannabis. The use of hashish compounds had become commonplace in almost all European countries and in the USA. Nonetheless, it was still scientists from England, France, Germany and the USA who persistently continued cannabis research. It is, therefore, not a coincidence that most of the products on the market (‘specialities’) originated in these countries. It is first of all through the contribution of the company E. Merck of Darmstadt, Germany, that cannabis compounds became more widely used in Europe towards the end of the 19th century. One of the preferred source materials in the production of cannabis compounds in this period was *Cannabinum tannicum Merck*. In addition, the company Burroughs, Wellcome & Co. in England produced cannabis compounds. In

the USA, cannabis compounds were manufactured by Squibb and sons in New York ('Chlorodyne and Corn Collodium'), and, later, Parke-Davis & Co. in Detroit ('Utroval' and 'Casadein') and Eli Lilly ('Dr Brown's Sedative Tablets', 'Neurosine' and 'The One Day Cough Cure'). These companies delivered sufficient quantities of high-quality raw materials and produced compounds for the market. Probably the most-used hemp compound was the sleeping pill *Bromidia*, of the American company Battle & Co. This was a combined drug, that is, in addition to cannabis extract it contained bromine potassium, chloral hydrate and henbane. While single compounds dominated during the 19th century, combination compounds were preferred in the 20th century. Most cannabis drugs were for internal use, but there existed topical compounds, for instance, creams or the common clavus tinctures.

In the meantime, France continued its 50-year tradition and honoured medical doctors and pharmacists with doctoral degrees based upon works on hashish. In 1891 Georges Meurisse (born 1864) published his work *Le Haschich*, and five years later *Le chanvre indien* by Hastings Burroughs (born 1853) appeared. The latter is strongly based on Villard's work, but also upon his own therapeutic experiments. He summarises: 'In therapeutic doses, the Indian hemp is safe and would deserve to be more frequently used' (Burroughs, 1896).

In Germany, the PhD students H. Zeitler ('On Cannabis indica', 1885) and M. Starck ('How to apply the new cannabis compounds', 1887) first wrote their graduation dissertations, before the pharmacist Leib Lapin in 1894 published his dissertation, 'A contribution to the knowledge of *Cannabis indica*', under the guidance of the leading figures Johan Georg Dragendorff (1836–1898) and Rudolf Kobert (1854–1918). In the first part of his work, he gives an overview of 'common, manufactured and officinal hemp compounds' in use at the time. In the second part he describes the pharmacology of 'cannabindon', a cannabis derivat first studied by him. In the preamble of his investigation, he makes a remark which shows the uncertainty that existed regarding the medical safety of Indian hemp:

Had it been so simple to solve the hashish question, it would certainly have been solved by one of the numerous previous investigators. I believe that I have contributed to the definitive resolution, and this belief gives me the courage to publish the following as a dissertation.

(Lapin, 1894)

A scientific contribution of extraordinary importance within the cannabis research of the 19th century was the so-called *Indian Hemp Report* of 1894. This census, carried out by Great Britain in its colony India, primarily studied the extraction of drugs from cannabis, the trade in these drugs and the implications for the total population. Additionally, the study set out to clarify whether prohibition of the compounds might be justified, and an expert commission was established for this purpose. Its report impressively shows the significance of the stimulant and drug cannabis in India towards the end of the 19th

century. The main conclusion of the commission was: 'Based upon the effects of the hemp drugs, the commission does not find it necessary to forbid the growing of hemp, nor the production of hemp drugs and their distribution' (Leonhardt, 1970).

Towards the 20th century, Indian hemp enjoyed an important position in the *materia medica* of Western medicine. Evidence of misuse of cannabis compounds was practically non-existent until then. Kunkel writes:

The chronic misuse of cannabis compounds — cannabism — is believed to be widespread in Asia and Africa. It results in chronic, heavy disruption of the entire organism, especially mental disorder — attacks of raving madness and a subsequent condition of weakness. It is not observed in Europe, Indian doctors report however daily frequent cases of this disease.

(Kunkel, 1899)

To sum up, hashish played a significant role as a medicine in Europe and in the USA towards the end of the 19th century. The most important applications were against pain, especially migraine and dysmenorrhoea, pertussis, asthma and insomnia. Additionally, hashish was relatively frequently used as an additive in clavus supplements. Rare applications were stomach ache, depressions, diarrhoea, diminished appetite, pruritus, haemorrhage, Basedow syndrome and malaria. Cannabis compounds were also used in numerous single cases, partly with good results. These were, however, of smaller significance.

Typically, doctors who worked intensively with cannabis drugs for years would classify them as valuable medicines. Others criticised them, and frequently looked upon them as worthless or even dangerous. However, both groups agreed on the unpredictable effect of cannabis compounds.

After keen use of cannabis compounds around the turn of the century, they disappeared completely in the middle of the 20th century. The main reasons for the disappearance of hashish medicaments are medical developments. Even before the 20th century, new, specific medicines were introduced for all main applications of cannabis compounds. Vaccines were developed for the treatment of infectious diseases (cholera, tetanus, etc.), which not only fought the symptoms as cannabis did, but also gave protection against infections. Other bacterial illnesses, such as gonorrhoea, that were frequently treated with cannabis could somewhat later be treated successfully with chemotherapeutica. *Cannabis indica* received competition as a sleeping and tranquillising drug in the form of chemical substances such as chloral hydrate or barbiturate. Contrary to the numerous opium drugs, cannabis compounds were also replaced as analgesics by chemical substances. In this area, aspirin achieved great importance shortly after its introduction in 1899.

Another reason for the decline of cannabis as medicine was pharmaceutical instability. The varying effectiveness of the hashish compounds has often been noted. Very different factors, such as origin, age, storage and galenic preparation, affected effectiveness of the medicine. Unlike, for instance, alkaloid drugs such as opium, the isolation of active ingredients was not successful until the middle of the 20th century. This resulted in standardisation problems. There were also legal constraints. The use of cannabis compounds became more and more restricted in international and national law. Hashish compounds were defined as anaesthetics some time in the 20th century. This complicated their use enormously, until finally a general ban made it impossible to apply them.

Finally, economic aspects contributed to the decline in use of medical cannabis. Import into Europe of high-quality Indian hemp became more and more difficult due to constraints in the producing countries (mainly India) and the influences of the two world wars. Laws of supply and demand also applied to cannabis, resulting in a massive price increase for raw materials (e.g. herba *Cannabis indicae*) as well as for compounds (e.g. extractum *Cannabis indicae*).

Cannabis as medicine — the contemporary situation

As already mentioned, hemp compounds were still frequently used at the beginning of the 20th century, and scientific research on the plant was promoted. However, its standing declined rapidly, and towards the middle of the 20th century cannabis as a medicine gradually faded into insignificance. Finally, the use of cannabis was prohibited worldwide through international agreements.

In particular, use of cannabis as a medicine was made impossible by the Convention on Narcotic Drugs of 1961 (see Ballotta et al., this monograph). Only lately have individual countries begun to stretch the application of this regime, as in Holland, where since September 2003 cannabis can be bought in pharmacies on prescription. In specific cases, cannabis can be used as medicine in Canada and in some US states without sanctions against the patients. In Canada, the cannabis medicine *Sativex* as a spray was licensed for treatment of neuropathic pain for multiple sclerosis patients in April 2005. Until then, only the two cannabinoids, THC and Nabilon, had been legally traded since the 1960s (IACM-News, 2005). Other European countries, such as the United Kingdom, Spain, and more recently Switzerland and Italy, have for some time undertaken efforts to explore possible benefits of cannabis for medical purposes (see Witton, this monograph).

In spite of the ban on cannabis, research on the medical effects of this ancient drug plant has not stood still. In many countries, scientific work with cannabis was and is allowed. The discovery of Δ^9 -tetrahydrocannabinols (THCs) in 1964 and the cannabinoid

receptors (CBs) in 1988 are important milestones in cannabis research. Four years later, the existence of endocannabinoids was proven, that is substances produced by the human body that function as agonists to cannabinoid receptors. Presently, the first selectively working CB1 receptor antagonist rimonabant is being clinically tested (phase III). It seems that this receptor may be used against overweight and metabolic risk factors, as well as with tobacco withdrawal (Heinzl, 2005).

Since the cannabinoid system was discovered, agents that make use of the therapeutic effects of the cannabinoids have been intensively searched for, thereby avoiding the psychotropic side-effects. Just in the years following the discovery and investigation of the chemical structure of THC's until 1986, approximately 6 000 scientific studies of the chemistry, pharmacology, clinical properties and metabolism of the THC's have been published (Mechoulam, 1986). During the last 20 years, research on the hemp plant has intensified. It is hardly possible to provide an overview the abundance of data and scientific publications. Presently, various clinical studies of the effects of hemp on certain illnesses are being undertaken.

A summary of research focal points and possible fields of cannabis application is given below. According to Grotenhermen (2004), therapeutic effects of cannabis or segregated THC (or dronabinol) may, based on current science, be divided as follows:

- 1 Established effect: nausea and vomiting, anorexia and loss of weight.
- 2 Relatively well-proven effect: spasms, pain conditions, movement disturbances, asthma, glaucoma.
- 3 Unproven effect: allergies, itchininess, inflammations and infections, epilepsy, depressions, and anxiety disturbances.
- 4 Basic research: auto-resistant diseases, cancer, neuroprotection, fever and blood pressure disturbances.

As previously mentioned, some of these applications had already been in use for a long time based on experience. Interestingly, long-proven indications have more recently been scientifically documented. In spite of the ban on cannabis, it is frequently used by patients in the form of tea or tinctures and sometimes recommended by medical doctors against the law. In practical terms, some multiple sclerosis patients successfully use cannabis as an antispastic, and some migraine patients frequently use it as a pain reliever.

Bibliography

- Abel, E. L. (1980), *Marihuana: the first twelve thousand years*, Plenum Press, New York
www.druglibrary.org/Schaffer/hemp/history/first12000/abel.htm
- Behr, H. G. (1982), *Von Hanf ist die Rede, Kultur und Politik einer Droge* [Let's talk about hemp. Culture and Politics of a plant], Sphinx-Verlag, Basel.
- Bennett, C., Osburn, J., Osburn, L. (1995), *Green gold the tree of life; marijuana in magic and religion*, Access Unlimited.
- Beron, B. (1852), *Über den Starrkrampf und den indischen Hanf* [On tetanus and Indian hemp], MD dissertation, University of Würzburg, Germany.
- Booth, M. (2003), *Cannabis: a history*, Doubleday, London.
- Burroughs, H. (1896), *Le Chanvre indien* [Indian hemp], Thèse de doctorat en médecine, Lyon.
- De Courtive, E. (1848), *Haschisch. Etude historique, chimique et physiologique* [Hashisch, Historical, chemical and physiological study], Thèse présentée à l'École de Pharmacie de Paris le 11 avril 1848, Ed. Bautruche, Paris.
- Dierbach J. H. (1828), *Die neusten Entdeckungen in der Materia medica* [An update on the discoveries on Materia medica], Heildelberg and Leipzig, 420.
- Emboden, W. A. (1974), 'Cannabis, a polytypic genus', *Economic Botany* 28: 304–310.
- Falck, C. (1856), 'Cannabis', in *Canstatt's Jahresbericht. über die Fortschritte in der Pharmacie im Jahr 1855, Neue Folge, Fünfter Jahrgang* [Canstatt annual report. On progress in pharmaceutical science in the year 1855, fifth reporting year], Würzburg.
- Fankhauser, M. (2002), 'History of cannabis in Western medicine', in Grotenhermen, F., Russo, E. (eds), *Cannabis and cannabinoids*, The Haworth Integrative Healing Press, New York.
- Fronmueller, B. (1869), *Klinische Studien über die schlafmachende Wirkung der narkotischen Arzneimittel* [Clinical studies on the sleep inducing effects of narcotic medicines], Erlangen.
- Green, J. (2002), *Cannabis*, Pavilion, London.
- Grinspoon, L. and Bakalar, J. B. (1993), *Marihuana, the forbidden medicine*, Yale University Press, New Haven.
- Grotenhermen, F. (2002), 'The medical use of cannabis in Germany', *The Journal of Drug Issues* 2(2): 607–634.
- Grotenhermen, F. (2004), *Cannabis und Cannabinoide, Zweite, vollständig Überarbeitete Auflage* [Cannabis and cannabinoids, the second complete revised edition], Supplementheft: Forschende Komplementärmedizin/Research in Complementary Medicine 1999, Band 6, Suppl. 3, Bern.
- Haenel, T. A. (1970), *Kulturgeschichte und heutige Problematik des Haschisch* [Cultural history and contemporary problems of Hashish], medical dissertation, Basel.
- Heinzel, S. (2005), 'Endocannabinoid and endocannabinoid receptor antagonists', *Medizinische Monatsschrift für Pharmazeuten* 28(2): 40–43.
- Hirsch, A. (Hrsg.) (1884–1886), *Biographisches Lexikon der hervorragenden Aerzte aller Zeiten und Völker* [Biographical lexicon of excellent doctors across times and people], Wien/Leipzig.
- Kobert, R. (1897), *Lehrbuch der Pharmakotherapie* [Textbook in drug targeting], Stuttgart.
- Kobylanski von, F. (1852), *Über den indischen Hanf mit besonderer Rücksicht auf seine wehenfördernde Wirkung* [On Indian hemp with particular consideration on uterotonikum effects], medical dissertation, Würzburg.
- Kunkel, A. J. (1899), *Handbuch der Toxikologie, Erste Hälfte* [Handbook in toxicology, first edition], Jena.
- Lapin, L. (1894), *Ein Beitrag zur Kenntnisse der Cannabis indica* [A contribution in the knowledge on cannabis indica], dissertation, University of Jurjew.
- Leonhardt, R. W. (1970), *Haschisch-Report, Dokumente und Fakten zur Beurteilung eines so genannten Rauschgiftes* [Hashish report, documents and facts to estimate the so-called drugs], Munich, 86.

- Martius, T. (1844), *Pharmakognosie und Pharmazie im Jahre 1842* [pharmacognosy and pharmacy in 1842], Jahresb. Über die Fortschr. der Pharmacie in allen Ländern im Jahre 1842, Erlangen.
- Mathre, M. L. (ed.) (1997), *Cannabis in medical practice: a legal, historical, and pharmacological overview of the therapeutic use of marijuana*, McFarland, Jefferson.
- Matthews, P. (2003), *Cannabis culture: a journey through disputed territory* (2nd edition), Bloomsbury, London.
- Mechoulam R. (1986), *Cannabinoids as therapeutic agents*, Boca Raton.
- Medizinische Monatszeitschrift für Pharmazeuten* (2005), [Medical monthly journal for pharmacists] 28 (2).
- Mercuri, A. M., Accorsi, C. A., Bandini-Mazzanti, M. (2002), 'The long history of cannabis and its cultivation by the Romans in central Italy shown by pollen records from Lago di Albano and Lago di Nemi', *Veg. Hist. Archaeobot.* 11: 263–276.
- Moreau, H. (1904), *Etudes sur le hachich* [Study on Hashish], doctoral thesis, Paris.
- Nees v. Esenbeck, T. F. L., Ebermaier, C. H. (1830), *Handbuch der medicinisch- pharmazeutischen Botanik* [Handbook of medical and pharmaceutical botany], first edition, Düsseldorf, 338–339.
- O'Shaughnessy, W. B. (1839), 'On the preparations of the Indian hemp, or Gunjah', *Transactions of the Medical and Physical Society of Bengal (1838–40)*: 421–461. Reprint in Mikuriya, T. H. (ed.), *Marijuana medical papers 1839–1972*, Medi-Comp Press, Oakland, CA (1973), 29 www.druglibrary.org/schaffer/history/e1850/gunjah.htm
- Rätsch, C. (2001), *Marijuana medicine: a world tour of the healing and visionary powers of cannabis*, Healing Arts Press, Rochester.
- Sloman, L. (1998), *Reefer madness: a history of marijuana*, St Martin's Press, New York.
- Smith, T. and Smith, H. (1847), 'Process for preparing cannabine or hemp resin', *Pharmaceutical Journal and Transactions* 6: 171–173.
- Starck, M. (1887), 'How to apply the new cannabis compounds', in *Index-Catalogue of the Library of the Surgeon-Generals Office, United States Army, Vol. 3*, USGPO, Washington, 1898.
- Von Bibra, E. (1855), *Die narkotischen Genussmittel und der Mensch* [The narcotic stimulants and the human being], Nürnberg, 290.
- Von Schorff, K. D. (1858), *Fall einer Vergiftung mit Haschisch*, N. Rep. Pharm., Band VII, Munich.
- Weber, M., (1971), *Moreau de Tours, J. J. (1804–1884) und die experimentelle und therapeutische Verwendung von Haschisch in der Psychiatrie* [Moreau de Tours, J. J. (1804–1884) and the experimental and therapeutic application of hashish in psychiatry], Zürich.
- Wujastyk, D. (2002), 'Cannabis in traditional Indian herbal medicine', in A. Salema (ed.), *Ayurveda at the Crossroads of Care and Cure*, Centro de Historia del Alêmm-Mar, Universidade Nova de Lisboa, Lisbon, 45–73. Pre-publication draft at: www.ucl.ac.uk/~ucgdkw/papers/cannabis.pdf
- Zeitler, H. (1885), 'On Cannabis indica', in *Index-Catalogue of the Library of the Surgeon-Generals Office, United States Army, Vol. 3*, USGPO, Washington, 1898.

Chapter 2

The re-emergence of the therapeutic use of cannabis products: recent developments and future prospects

Keywords: cannabinoid – cannabis – dronabinol – medicinal use – medicines – multiple sclerosis – pharmaceutical – pharmacology – pharmacy – Sativex – therapeutics – therapy

Setting the context

The previous chapter looked at the history of medicinal use of cannabis. It is interesting to consider that, a century ago, the patent medicine J. Collis Browne's *Chlorodyne* (a mixture of laudanum, tincture of cannabis, and chloroform) could be purchased at chemists and was marketed as 'the most wonderful and remarkable remedy ever discovered' ⁽¹⁾. Yet historical anecdotes about medicinal use of cannabis are gradually being displaced by a wealth of international research on cannabinoids and their role in therapeutics. This brief chapter — which may be perceived as a postscript to the previous one — provides a summary of recent developments in medicinal cannabis.

Researchers in this area are highly productive, and so this chapter is likely to suffer from almost instant obsolescence. Nonetheless, the chapter reveals that, at the time of writing in late 2007, there are relatively few cannabis-derived medicines that have received regulatory approval. Forecasts dating from the early 2000s that cannabinoids may become the new blockbuster branch of the pharmaceutical industry seem to be premature. Yet a recent market report by Visiongain ⁽²⁾ remains upbeat, valuing the global cannabis medicines market at USD 700 million. Besides interest from the pharmaceutical industry, there is an increasing body of research on 'self-medication' using herbal cannabis. The knowledge base is increasing, following relaxation of legislation relating to medicinal use of cannabis in some US states and the Netherlands, together with grassroots organisations focusing on medicinal use of herbal cannabis in Canada and several European countries.

⁽¹⁾ Advertisement for J. Collis Browne's *Chlorodyne*, 1891.

⁽²⁾ www.visiongainintelligence.com/reportDetail.aspx?reportId=1359

Further reading

- Grotenhermen, F. (2005), *Cannabis und Cannabinoide: Pharmakologie, Toxikologie und therapeutisches Potenzial*, Huber, Bern.
- Hall, W., Pacula, R. (2003), *Cannabis use and dependence: public health and public policy*, Cambridge University Press.
- Icon Group International (2003), *Cannabis: a medical dictionary, bibliography, and annotated research guide to Internet references*, Health Publica Icon Health Publications, San Diego.
- Mechoulam, R. (ed.) (2005), *Cannabinoids as therapeutics, milestones in drug therapy*, Springer Verlag, Berlin.

Websites

The International Association for Cannabis as Medicine (IACM)

www.acmed.org

The International Cannabinoid Research Society

www.cannabinoidsociety.org

Sociedad Española de Investigación Sobre Cannabinoides

www.ucm.es/info/seic-web/

See also the grey literature list in the Appendix to Volume 1 of this monograph (p.300).

The re-emergence of the therapeutic use of cannabis products: recent developments and future prospects

John Witton

The past two decades have seen renewed and concerted interest in the therapeutic potential of cannabis. Tetrahydrocannabinol (THC), the active and most significant constituent of cannabis, and other closely related compounds were identified in the 1960s. However, it was not until the mid-1980s and 1990s that research accelerated, when understanding increased of the biology of the body's endocannabinoid system and how cannabis works on the brain. These discoveries opened up possibilities to exploit cannabis-based products for medical use. This renewed scientific interest in the cannabinoids is evidenced by (i) the increase in the number of research papers on the biology of cannabinoids, from 200–300 per year through the 1970s to nearly 6 000 in 2004, and (ii) the number of cannabinoid drugs under pharmaceutical development, rising from 2 in 1995 to 27 in 2004 (Pacher et al., 2006).

The identification of a natural cannabinoid receptor–neuromodulator system in the body was the key to pharmacological and therapeutic developments. Receptors are the sites of action for brain chemicals, called neurotransmitters, and often the sites of action of drugs. Binding of the neurotransmitter or drug to the brain cell receptor causes a response in the cell. Two cannabis receptors (termed CB1 and CB2) have been found (Pertwee, 1997). CB1 receptors are distributed in discrete areas of the brain, particularly concentrated in the hippocampus and cerebral cortex (areas concerned with memory and cognition), olfactory areas, basal ganglia and cerebellum (areas concerned with motor activity and posture control) and the spinal cord. CB2 receptors are found peripherally and are closely linked with cells in the immune system (Kumar et al., 2001). With the discovery of cannabis receptors it became possible to develop cannabinoid agonists or antagonists — that is, agents that activate or bind but do not activate the receptors — that might act as therapeutic tools or help determine the roles of the cannabinoid receptors and the body's own endogenous cannabinoids (British Medical Association, 1997). Two major endocannabinoids have been identified and isolated: anandamide and 2-arachidonoyl glycerol. This endogenous cannabinoid system is

involved in analgesia, cognition, memory, locomotor activity, appetite, vomiting and immune control (Kumar et al., 2001).

As the structure–activity relationships of the cannabis receptors and endocannabinoid system unfolded, the potential for cannabis-based medicines became clearer. But in a review of these developments, a leading neuropharmacologist, Professor Leslie Iversen, suggested that pharmaceutical companies faced a range of substantial obstacles in developing cannabis-based medications. These obstacles were: development costs would be high; only synthetic cannabinoids could be patented rather than the natural product; products would be likely to be niche drugs rather than ‘blockbuster’ drugs used to treat common health problems; there were already medicines available to treat the problems that cannabinoids might be used for; and finally, the vast US marketplace would be difficult to enter, with the US having strict regulatory requirements to introduce a drug that is derived from or chemically related to a prohibited substance (Iversen, 2003).

Over the last 30 years, widely reported use of illicitly smoked cannabis for self-medication for a range of illnesses has brought normally law-abiding citizens into conflict with their country’s legal system. Surveys have found that the common indications for cannabis use include depression, multiple sclerosis, pain, migraine, asthma and cancer-related anorexia/cachexia (Schnelle et al., 1999; Gorter et al., 2005). The ethical dilemmas surrounding this issue were among the factors that led to a number of enquiries examining the therapeutic potential of cannabis products. The British Medical Association’s 1997 report *Therapeutic Uses of Cannabis* and the 1998 report *Cannabis: the Scientific and Medical Evidence* from a Select Committee of the House of Lords both called for the setting up of clinical trials to evaluate the potential therapeutic use of cannabinoids. The prestigious US Institute of Medicine published its report *Medical Use of Marijuana* in 1999. Together, these reports established the evidence base to support the further examination of cannabis products for medical use. Medical and political interest intensified in several European countries and the medical use of cannabis was legalised in the Netherlands in 2003 (Grotenhermen and Russo, 2002; Gorter et al., 2005) and extended for a five-year period in 2007.

Naturally, cannabis products are subject to the same rigorous clinical testing and regulatory processes as any other potential medicine. Clinical trials for new medications normally follow three phases. In phase I the safety of the drug is established. In phase II the efficacy of the drug is established through giving the medication to a small group of potential patients who have the condition targeted by the medication. Finally, phase III trials use large studies involving hundreds of patients.

Two synthetic cannabinoid receptor agonists, dronabinol and nabilone, have already passed these stringent tests. They have been available and approved for medical use since the 1980s. However, neither has been widely prescribed. The effective dose for these cannabinoids is close to a dose that causes sedation or intoxication, limiting the amount of the drug that can be given to patients (Iversen, 2000). Moreover, their therapeutic potential has been superseded by more powerful medications.

Dronabinol is the non-proprietary name for tetrahydrocannabinol. Marinol capsules containing dronabinol were approved for use by the US Food and Drug administration for nausea and vomiting associated with cancer chemotherapy for patients who had not responded to conventional antiemetic medications. Marinol was also approved for use in anorexia associated with weight loss in patients with AIDS. Dronabinol is also available on prescription in a number of countries outside the USA. Dronabinol is manufactured by two German companies, THC Pharm and Delta 9 Pharma, and may be bought by pharmacies to produce dronabinol capsules or solutions. The second cannabinoid receptor agonist, nabilone, a synthetic derivative of dronabinol, was also approved by the FDA in 1986 for use in treatment of nausea and vomiting associated with chemotherapy. It is delivered in the form of Cesamet capsules. Nabilone was originally developed by Eli Lilly in the USA but was not marketed there, but is available in the UK and other European countries.

Two more cannabis-related drugs have become available more recently. The British biotech firm GW Pharmaceuticals has developed Sativex, a cannabis plant extract, consisting of equal amounts of dronabinol (THC) and cannabidiol, another important cannabinoid. Sativex is delivered as an oral spray. Using a spray for delivery provides a consistent quality to the medication and enables doctors to set standard dosages. The spray technique also avoids the carcinogenic smoke normally associated with cannabis use. It also allows for flexible dosing, important when people with MS experience variable amounts of pain.

In 2005 Sativex received approval as an adjunctive treatment for the relief of symptomatic pain related to muscular sclerosis in Canada through the governmental Health Canada's Notice of Compliance with Conditions policy. This policy is applied to products which Health Canada considers as addressing a serious medical condition for which there are no currently approved products and where data from clinical trials to date appear to be promising. The condition to be satisfied is a need for confirmatory phase II study to further verify the clinical benefit of the product. In June 2007 Sativex was approved by the Canadian regulatory authority for use in cancer-related pain. More recently, GW has reached an agreement with the Japanese pharmaceutical firm Otsuka to develop and market Sativex in the USA, where it will be initially trialled for cancer pain.

In Europe, in November 2005 Sativex and the Catalan Health Authority reached agreement to supply Sativex to up to 600 patients suffering from multiple sclerosis under a compassionate access programme. Initial results from a patient study suggested that 65% of the patients had experienced an improvement in quality of life and a decrease in pain. In the UK, the Home Office permitted the prescription of Sativex to individual patients as an unlicensed medicine. Thus, Sativex can be supplied on a named patient basis from the drug's manufacturing site and dispensed by local pharmacies to patients. At the time of writing (end of 2007), Sativex is awaiting approval as a prescription drug for multiple sclerosis in Spain, Denmark and the Netherlands.

The second new drug, the cannabinoid receptor antagonist rimonabant, received a positive recommendation for approval by the European Medicines Agency in 2006. Available in the United Kingdom for the treatment of obesity under the name Acomplia, a Cochrane review found rimonabant use with diet and exercise led to modest weight loss at one year follow-up in the four studies under review. However the review authors suggested caution in interpreting the results of their review because of methodological shortcomings in the studies reviewed, high drop-out rates among participants and the need for longer term follow-up (Curioni and André, 2007). In the USA, rimonabant (planned to be marketed under the name Zimulti) was rejected by the Food and Drug Administration in June 2007. The FDA cited concerns on side-effects such as depression, anxiety and sleep problems when taking the drug.

Another cannabis-related product under investigation in clinical trials is Cannador, containing dronabinol and other cannabinoids. Studies have examined Cannador's value in treating spasticity and other symptoms related to multiple sclerosis and post-operative pain (Holdcroft et al., 2006; Zajicek et al., 2006). Further trials with Cannador have been undertaken at the Institute for Clinical Research in Berlin. There has been some interest in investigating the potential of cannabidiol as an antipsychotic (Zuardi et al., 2006).

Away from pharmaceutical cannabis-related preparations, the use of its natural form for medicinal purposes has also progressed recently. While cannabis remains illegal under federal law in the US, 13 states have made available the medical use of cannabis under their state laws. The latest to legalise medical use of cannabis is New Mexico, where 1 742 patients are authorised to possess dried cannabis as a medication. 1 040 are licensed to grow their own cannabis and 167 people are licensed to grow cannabis for the use of authorised patients. Here the state's health ministry buys the cannabis from these licensed growers and sells it on to the patient.

In terms of very recent developments, in Finland the Ministry of Social Affairs and Health in December 2007 sought to clarify legislation on prescribing cannabis to sufferers of chronic pain, based on the implications of a test case involving an individual who had obtained special permission from the ministry for using cannabis for pain relief. A Canadian pharmaceutical research company called Cannasat Therapeutics is developing three candidate medicines, named CAT 210, CAT 310 and CAT 320, for which it forecast Phase II testing for the lead candidate, CAT 310, 'by the end of 2008'. In late 2007, a Dutch company called Echo Pharmaceuticals, based in Weesp, announced funding aimed at developing a cannabis-based pill called Namisol, targeting numerous therapeutic applications. The company is partnering with the cannabis grower Bedrocan, as well as the companies Farmalyse and Feyecon, to develop a pill.

Bibliography

- British Medical Association (1997), *Therapeutic uses of cannabis*, British Medical Association Board of Science and Education, Harwood Academic Publishers, Reading.
- Curioni, C., André, C. (2007), 'Rimonabant for overweight or obesity', *Cochrane Database of Systematic Reviews 2007, Issue 3*.
- Gorter, R., Butorac, M., Pulido Cobian, E., van der Sluis, W. (2005), 'Medical use of cannabis in the Netherlands', *Neurology* 64: 917–919.
- Grotenhermen, F., Russo, E. (eds) (2002), *Cannabis and cannabinoids: pharmacology, toxicology, and therapeutic potential*, Haworth Press, Binghamton.
- Holdcroft, A., Maze, M., Doré, C., Tebbs, S., Thompson, S. (2006), 'A multicenter dose-escalation study of the analgesic and adverse effects of an oral cannabis extract (Cannador) for postoperative pain management', *Anesthesiology* 104(5): 1040–1046.
- House of Lords, Select Committee on Science and Technology (1998), *Cannabis: the scientific and medical evidence (ninth report)*, Home Office, London.
- Iversen, L. (2000), *The science of marijuana*, Oxford University Press, Oxford.
- Iversen, L. (2003), 'Cannabis and the brain', *Brain* 126: 1252–1270.
- Joy, J., Watson, S. and Benson, J. (1999), *Marijuana and medicine: assessing the science base*, Division of Neuroscience and Behavioral Research, Institute of Medicine, National Academy Press, Washington.
- Kumar, R., Chambers, W., Pertwee, R. (2001), 'Pharmacological actions and therapeutic uses of cannabis and cannabinoids', *Anaesthesia* 56: 1059–1068.
- Pacher, P., Bátkai, S., Kunos, G. (2006), 'The endocannabinoid system as an emerging target of pharmacotherapy', *Pharmacological Reviews* 58: 389–462.
- Pertwee, R. (1997), 'Pharmacology of cannabinoid CB1 and CB2 receptors', *Pharmacology and Therapeutics* 74: 129–180.
- Schnelle, M., Grotenhermen, F., Reif, M., Gorter, R. (1999), 'Ergebnisse einer standardisierten Umfrage zur medizinischen Verwendung von Cannabisprodukten im deutschen Sprachraum', [Results of a standardized survey on the medical use of cannabis products in the German-speaking area], *Forsch Komplementarmed* 6 (Suppl. 3): 28–36.

- Zajicek, J., Sanders, H., Wright, D., Vickery, P., Ingram, W., Reilly, S., Nunn, A., Teare, L., Fox, P., Thompson, A. (2006), 'Cannabinoids in multiple sclerosis (CAMS) study: safety and efficacy data for 12 months follow up', *Journal of Neurol Neurosurg Psychiatry* 76(12): 1664–1669.
- Zuardi, A., Hallak, J., Murat Dursun, S., Morais, S., Sanches, R., Musty, R., Crippa, J. (2006), 'Cannabidiol monotherapy for treatment-resistant schizophrenia', *Journal of Psychopharmacology* 20(5): 683–686.

Chapter 3

The pharmacology of cannabis: issues for understanding its use

Keywords: cannabinoids – cannabis – pharmacology – physical effects – THC

Setting the context

To understand cannabis, it is helpful to have a knowledge of the pharmacology of the drug. What are the psychoactive effects of the substance, and what physical and neurological changes are brought about by the product? What can be said about the varying effects of dosage, route of administration, the type of product (herb, resin, oil), and the use environment?

Scientific knowledge about the pharmacology of cannabis has seen substantial progress in the last three decades. In addition to substantial work in neuroscience, cannabinoid research accelerated following the discoveries in the late 1980s of cannabinoid-like chemicals produced by the body, known as 'endocannabinoids'.

As with much science, much of the literature on cannabis is technically challenging, especially for those approaching drugs from disciplines such as sociology and political science. In addition, there is a glut of information in the scientific journals: a Medline search on 'cannabis pharmacology' reveals over 3 500 articles, and many more are published each month. Meanwhile, users seeking to explore the science of cannabis are likely, sooner or later, to encounter disinformation and inaccuracy. User reports are by nature subjective, and growshop information is compromised by the incentive to sell. Pro-cannabis lobbying information is skewed towards innocuous and euphoric effects or favourable comparisons with alcohol. Prohibitionist literature emphasises the risks of cannabis smoking without placing sufficient emphasis on the sought-after effects of cannabis.

Fortunately, help is at hand for those first approaching the subject. A number of initiatives have sought to provide information that is simultaneously accurate and

Table 1: Summary of the effects of cannabinoids

System	Effect
Central nervous system (CNS)	
Psychological effects	Euphoria, dysphoria, anxiety, depersonalisation, aggravation of psychotic states
Effects on perception	Heightened sensory perception, distortion of space and time sense, misperceptions, hallucinations
Sedative effects	Generalised CNS depression, drowsiness, sleep, additive effect with other CNS depressants
Effects on cognition and psychomotor performance	Fragmentation of thoughts, mental clouding, memory impairment, global impairment of performance
Effects on motor function	Increased motor activity followed by inertia and uncoordination, ataxia, dysarthria, tremulousness, weakness and muscle twitching
Analgesic effects	Similar in efficacy to codeine
Antiemetic effects	In acute doses, effect reversed with larger doses or chronic use, increased appetite
Tolerance	To most behavioural and somatic effects, including the 'high' with chronic use
Dependence, abstinence syndrome	Rarely observed but has been produced experimentally following prolonged intoxication or administration of antagonists
Cardiorespiratory system	
Heart rate	Increased with acute dosage, decreased with chronic use
Peripheral circulation	Vasodilation, conjunctival redness and postural hypotension
Cardiac output	Increased output and myocardial oxygen demand
Cerebral blood flow	Increased in the short term and decreased with chronic use
Breathing	Small doses stimulate, larger doses depress coughing but tolerance develops
Airways obstruction	Due to chronic smoking
Eye	Decreased intraocular pressure
Immune system	Impaired activity of bactericidal macrophages in lung and spleen
Reproductive system	Decreased sperm count and sperm motility in males, suppression of ovulation, complex effects on prolactin secretion, increased obstetric risks

Source: R. Kumar, W. Chambers, R. Pertwee (2001), 'Pharmacological actions and therapeutic uses of cannabis and cannabinoids', *Anaesthesia* 56(11): 1059–1068.

accessible, and valuable publications exist for a variety of audiences (see *Further reading*, below). One of the products of a more didactic approach is the simplified summary above by Kumar et al., republished in a number of government monographs since its first appearance in 2001 (Table 1). The chapter that follows, by a leading authority based at Trinity College Dublin, provides a short summary of what is known to date about the pharmacology of cannabis. A glossary is provided to assist non-specialists.

Further reading

Handbooks for research scientists

- Di Marzo, V. (ed.) (2004), *Cannabinoids*, Kluwer Academic/Plenum Publishers, New York.
- Pertwee, R. (ed.) (2005), *Cannabinoids (Handbook of experimental pharmacology)*, Springer, Heidelberg.

Broader scientific research on cannabis and cannabinoids

- Grotenhermen, F., Russo, E. (eds) (2002), *Cannabis and cannabinoids: pharmacology, toxicology, and therapeutic potential*, Haworth Press, Binghamton.
- Iversen, L. (2000), *The science of marijuana*, Oxford University Press, Oxford.
- Joy, J. et al. (1999), *Marijuana and medicine: assessing the science base*, National Academy Press, Washington DC.
- Kalant, H., Corrigal, W., Hall, W., Smart, R. (1999), *The health effects of cannabis*, Centre for Addiction and Mental Health, Toronto.
- Raynaud, M. (ed.) (2004), *Cannabis et Santé*, Flammarion Médecine-Sciences, Paris.
- Sociedad española de investigación sobre cannabinoides (2002), *Guía Básica sobre los Cannabinoides*, SEID, Madrid.

Reviews for practitioners and clinicians

- Ashton, H. (2001), 'Pharmacology and effects of cannabis: a brief review', *The British Journal of Psychiatry* 178: 101–106.

Fact files for users

- EMCDDA (2007), *Drugs profiles: cannabis*, European Monitoring Centre for Drugs and Drugs Addiction, Lisbon
www.emcdda.europa.eu/index.cfm?nodeid=25484
- Karila, M., Reynaud, L. (2006), *Fiche Technique, Janvier 2006: Le Cannabis*, Comité d'éducation sanitaire et sociale de la pharmacie française, Paris.
- MIND (2006), *Fact sheets: the psychological effects of cannabis*, MIND, London.

Summaries of national government reports

- Ben Amar, M. (ed.) (2001), *Cannabis, drogues, santé et société 2 (2)*, Montreal.
- Rodin Foundation (2005), *Le cannabis: document de travail*, Brussels
www.rodin-foundation.org/PDF//publications/43_fr.pdf

See also the grey literature list in the Appendix to Volume 1 of this monograph (p. 300).

The pharmacology of cannabis: issues for understanding its use

Desmond Corrigan

Abstract

The drug products obtained from the plant *Cannabis sativa* contain many different chemicals. The most active are the phytocannabinoids, such as THC, which exert their psychoactive effects by binding to specific receptors within the brain and other parts of the body. The existence of a complex endocannabinoid system within humans and other animals and the interaction between the phytocannabinoids and this system explains many of the rewarding, dependence-producing effects of cannabis drugs as well as their influence on movement, coordination, reactions, memory and learning, especially since the brain regions implicated in these effects are richest in cannabinoid receptors. Cannabinoids are highly fat-soluble and their metabolism and slow excretion from the body distinguishes them from other drugs, such as alcohol. The slow elimination of THC explains the low intensity of withdrawal symptoms and also why urine tests following consumption test positive for cannabinoids for much longer than for most other psychoactive drugs (up to two weeks).

Cannabis drugs

The plant *Cannabis sativa L.* is the source of a number of drug products. While herbal cannabis (or marijuana) consists of dried plant parts, the main ingredient in cannabis resin (or hashish) is the resin secreted by the glandular hairs found all over the plant but mainly around the flowers. In addition to these two kinds of preparation, which have been used since time immemorial, hashish oil is extracted by use of a solvent (e.g. acetone) and evaporated. In addition, the cannabis plant can be used as a source of hemp fibres, as well as hemp seeds and fatty oil.

The flowering tops and leaves of the plant *Cannabis sativa* secrete a resin containing about 60 terpenophenolic compounds which are called cannabinoids, to distinguish the plant compounds from the endogenously occurring *endocannabinoids* found in most animals, especially humans. The highest amount of cannabinoids has been found in the flowering tops, followed by the leaves, whereas only small amounts are found in the stem and roots. While for many years herbal cannabis typically showed a lower cannabinoid content than preparations (resin and oil), innovation in cultivation techniques, pruning and seed selection have enabled marijuana growers to match or exceed the potency of resin (see King, this monograph).

Glossary

Endocannabinoids	Cannabinoids produced by the body, such as anandamide.
Free radical	An atom or group of atoms with at least one unpaired electron; in the body it is usually an oxygen molecule that has lost an electron and will stabilise itself by stealing an electron from a nearby molecule.
Ganglia (singular: ganglion)	Tissue mass which provides relay points and connections between different neurological structures in the body, such as the central nervous system.
Neurones	Nerve cells found in the brain, spinal cord and peripheral nerves. They communicate with one another using a complex of chemical and electrical signals.
Neurotransmitters	Chemicals which are used by neurones to communicate or signal to one another. Examples include dopamine and serotonin.
Phagocytosis	The ability of certain white blood cells (leucocytes), especially macrophages, to scavenge foreign material (especially bacteria) within the body as a first-line defence against infection.
Pharmacodynamic effects	What the drug does to the body, its organs, tissues and cells.
Pharmacokinetics	What the body does to the drug, that is, the speed at which it is absorbed into the bloodstream, transported to the site of action, metabolised and excreted from the body.
Phytochemical	A chemical compound containing carbon, hydrogen, oxygen and sometimes nitrogen produced by plants. Some are ubiquitous, such as starch. Some are pharmacologically active, such as morphine. Some are restricted to just one plant species, for example tetrahydrocannabinol in cannabis.
Receptors	Drugs act by binding to specific proteins located on the surface of cells. Once bound they can elicit a response (agonist effect) by causing an electrical impulse to be generated or the release of a signalling chemical within the cell. Sometimes drugs can prevent a response from the receptor, that is, act as an antagonist.
T lymphocyte	A small lymphocyte developed in the thymus; it orchestrates the immune system's response to infected or malignant cells.

Phytocannabinoids

The main cannabinoid is Δ^9 -tetrahydrocannabinol (THC), which is recognised as the major psychoactive euphoriant responsible for the characteristic intoxication ('high') which follows the smoking or ingestion of cannabis. High THC doses produce hallucinogenic effects. In addition to THC, several less potent metabolites and related compounds, such as the also psychoactive Δ^8 -THC and cannabidiol are found in the cannabis plant. Another major compound is cannabidiol (CBD), which has antagonistic effects to THC because it is a sedative compound. The ratio of THC to CBD in the plant is significant in terms of psychoactivity and is genetically determined.

A number of chemotypes exist within cannabis. These are plants which are visually and botanically identical but which are chemically dissimilar. One type referred to as the fibre- or hemp-type contains predominantly CBD and only trace amounts of THC (less than 0.3% THC according to Commission Regulation (EC no. 327/2002)). Conversely, drug-type plants produce predominantly THC with trace quantities of CBD. The issue is further complicated by the existence of an intermediate plant which contains approximately equal amounts of both THC and CBD. The concentrations of these and other cannabinoids vary enormously in practice depending on plant breeding and cultivation techniques and on post-harvest handling. The question of the potency of cannabis drugs, usually expressed in terms of THC content, is dealt with in the chapter by King (this monograph, p. 239). THC is a highly unstable compound, breaking down in air and light to a number of inactive molecules, one of which, cannabinol (CBN), is commonly found in cannabis products as they age. Other relatively abundant cannabinoids include cannabigerol (CBG) and cannabichromene (CBC) but in general little is known about the biological activities of these and the remaining less frequently occurring molecules.

Most pharmacological research has focused on THC and CBD. However, while THC is responsible for many of the effects of cannabis drugs, it is important to bear in mind that THC and cannabis are not synonymous for a number of reasons.

Firstly, THC does not exist as such in the plant material but rather it is found as an acid (THCA), as is CBD. These acids (THCA and CBDA) decompose slowly during storage to the corresponding chemically neutral but pharmacologically potent THC and CBD. This conversion is speeded up by the high temperatures involved in smoking and to a lesser extent by cooking or baking the drugs. Secondly, the THC/CBD ratio can markedly alter the effects of the drugs. Thirdly, some of the non-cannabinoid compounds from the plant may modulate the pharmacological effects of the cannabinoids. Terpenoids, which are responsible for the characteristic smell of cannabis, have been postulated as influencing the effects yet experimental evidence is scarce. Some 1% by weight of the plant is composed of a mixture of 20 flavonoid compounds which are well known as

antioxidants and which also scavenge damaging free radicals. Whether the quantities which survive the pyrolysis reactions involved in smoking cannabis are sufficient for activity is unknown (Musty, 2004).

Pharmacokinetics and metabolism

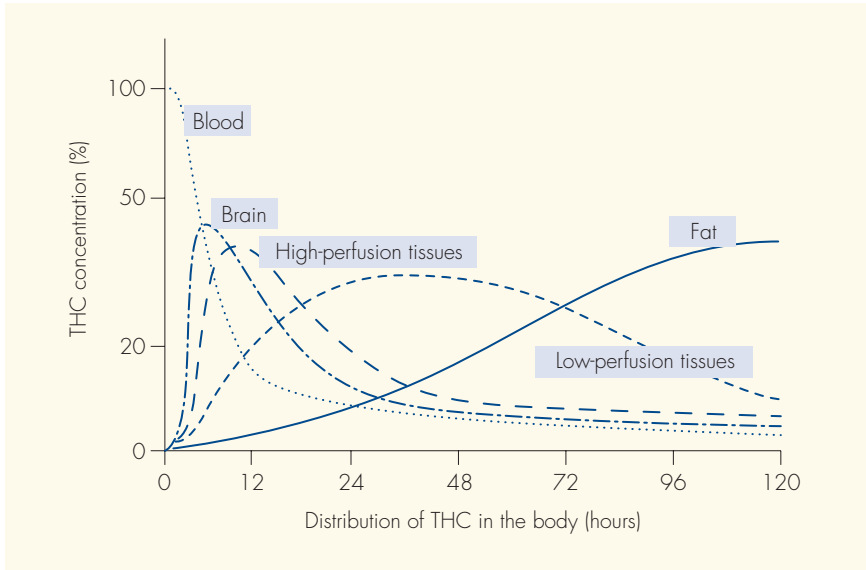
The dose of THC needed to produce effects in humans ranges from 2 to 22 mg (Adams and Martin, 1996). It is estimated that only 1 % of the THC content of a 'joint' is found in the brain after smoking; hence, only 2–44 µg of THC enters the brain in humans. Given the significant variation in cannabinoid content in the crude drugs and also in the weights of those crude drugs incorporated into 'joints' (Buchanan and O'Connell, 1998), there is little comparability or standardisation of dosages of THC and the other cannabinoids in practice.

THC is rapidly absorbed after inhalation of cannabis smoke and it is detectable in plasma within seconds. Between 10 and 50 % of the THC in the drug reaches the bloodstream. Losses due to burning account for 30 %, while sidestream smoke, incomplete absorption and retention within the cigarette ('joint') also produce significant losses. Inexperienced and infrequent smokers absorb approximately 10–14 % of the available THC whereas regular users absorb double that amount, probably because their more efficient smoking technique allows them to hold the smoke longer in their lungs. For the other major cannabinoids, the amounts absorbed range from 31 % for CBD to 38 % for CBN.

When cannabis is smoked, the effects start within seconds, reach a peak around 20 minutes and last for two to three hours (Figure 1). In contrast, if the drug is eaten, the effects are delayed and last longer, reaching a maximum about 3–4 hours after drug ingestion, and lasting for six to eight hours (Grotenhermen, 2003). After smoking, THC is detectable in the plasma only seconds after the first puff of a cannabis cigarette, with peak plasma level being measured 3–10 minutes after the first puff. This reflects the conversion of THC to its metabolites. This metabolism takes place in the liver and involves different enzymes, some of which are inhibited by CBD, which can thus affect the metabolism of THC. THC is further metabolised to a non-psychoactive molecule, which is excreted in urine as its glucuronide, although more than 100 different metabolites of THC have been identified (Hawksworth and McArdle, 2004). Only traces of the original THC are found in urine.

Because THC is highly fat soluble (lipophilic), plasma levels of THC fall rapidly after 30 minutes. However, its many metabolites are only slowly eliminated from the body as they are stored in fatty tissues. Complete elimination may take up to five weeks. So repeated cannabis use leads to an accumulation of cannabinoids in lipid-rich tissues including

Figure 1: Distribution of THC in the body over time



Source: Nahas (1975), quoted and commented in Ashton (2001).

the brain. THC is slowly released from fatty tissues into the bloodstream. There is, however, no simple relationship between the level of THC and its metabolites in blood and behavioural effects, such as psychomotor impairment (Agurell et al., 1986). This is because there is a delay between the subjective ‘high’ and THC in blood, and there are also large variations in individual psychoactive effects experienced at the same THC level in blood (see Figure 1).

The endocannabinoid system

THC and other cannabinoids act by binding to specific cannabinoid receptors found on the surface membranes of various cells located chiefly in the brain and in the immune system. Two receptors have been identified. The first cannabinoid receptor, CB1 (Matsuda et al., 1990), is expressed in the brain, in nerve cells, the reproductive system, some glandular systems and the microcirculation (Howlett et al., 2002, 2004; de Fonseca et al., 2005). The second cannabinoid receptor, CB2, is expressed in the peripheral tissues, principally in the immune system (Munro et al., 1993; Felder and Glass, 1998; Pertwee, 1999).

The discovery of these receptors — and there may be others in the body — led to the identification of a family of ‘endocannabinoids’. These molecules are arachidonic acid derivatives which have potent actions at the cannabinoid receptors. The discovery of

cannabinoid receptors and their endogenous ligand, the endocannabinoids, suggested the existence of an endogenous cannabinoid system. Subsequent elaboration of the biosynthesis, release, transport and degradation of these endocannabinoids within the body led to the realisation that they formed part of a new signalling system within the body termed the 'endocannabinoid system'. This has interactions with other neurotransmitters including gamma-aminobutyric acid (GABA), the opioid receptors and the dopamine system. The endogenous cannabinoid system seems to act as a neuromodulatory system, generally inhibiting the release of other neurotransmitters. CBD, on the other hand, does not bind to the CB receptors but may exert its sedating, hypnotic effects through other cannabinoid receptors which are believed, but not proven, to exist.

Cannabinoid receptors control cell differentiation in the developing brain. One of their most remarkable features is their high concentration within the brain, with densities 10–50 times greater than those of the classical neurotransmitter receptors, for example those for dopamine and opioids. CB1 receptors are expressed at particularly high densities in the cerebellum, hippocampus and in the basal ganglia (striatum, globus pallidum and substantia nigra). The presence of cannabinoid receptors in the hippocampus and the cortex suggested their involvement in the learning and memory process, whereas cannabinoids appear to mediate effects on motor activity, coordination and reactions through receptors in the basal ganglia and cerebellum. CB1 receptors are also found in the nucleus accumbens and frontal cortex, which is believed to account for the reinforcing effect of cannabinoids. Indeed, the endocannabinoid system controls the motivation for appetite stimuli, including food and drugs. Drugs of dependence tend to activate dopamine-producing nerve cells in the ventral tegmental area (VTA) and THC is no different because it increases dopamine release in the nucleus accumbens and prefrontal cortex.

The numerous investigations into the endocannabinoid receptor system and its interactions with other neuronal systems have resulted in a large body of scientific evidence which indicates that CB1 receptors, especially in the striatum, nucleus accumbens and the prefrontal cortex, mediate virtually all of the behavioural and neurochemical properties of THC and other cannabinoids. In particular, rewarding effects, tolerance and physical dependence have been ascribed to the brain endocannabinoid system and its interactions with the opioid, glutamate, GABA and especially the dopaminergic systems (Tanda and Goldberg, 2003). Gardner (2002) concluded that cannabinoids act on brain reward processes and related behaviours in ways that are remarkably similar to other addictive drugs. Studies with CB1 antagonists have shown the importance of these receptors in the whole phenomenon of craving. Ongoing studies highlight the significance of the endocannabinoid system in alcohol dependence, smoking cessation, weight loss, and self-administration of cocaine and opioids.

The CB1 receptor has also been identified in both male and female reproductive systems including the ovaries, the uterine endometrium, the testis, sperm, vas deferens and urinary bladder. Recent studies reviewed by Park et al. (2004) have demonstrated that marijuana, THC and other exogenous cannabinoids exert potent effects on the endocannabinoid system in both the gonads and during pregnancy. Current understanding indicates that endocannabinoids may be critical for embryo implantation and miscarriage.

The CB2 receptor has been detected in the spleen, tonsils and thymus gland, which are the major tissues involved in immune cell production. Cannabinoids including THC — which activate these receptors (agonists) generally — suppress the functions of lymphocytes, natural killer cells, macrophages and mast cells. Roth et al. (2002) summarised knowledge concerning CB2 receptors and cells involved in the immune system. They suggest a dynamic interaction between the receptors and the immune system, particularly leucocytes. Receptor expression is markedly altered in habitual cannabis smokers and the pattern of T lymphocyte responses to THC and the resulting immunological events may explain epidemiological reports linking cannabis use to opportunistic infections, AIDS and respiratory tract cancers. Nevertheless, as Witton (this monograph) points out, the evidence is not conclusive. Roth et al. (2002) observe that the most convincing evidence of immunosuppression comes from examining the antimicrobial activity of alveolar macrophages. Those from herbal cannabis smokers exhibit defective phagocytosis, are impaired in their ability to produce key immunological chemicals (interleukins, tumour necrosis factor, etc.) and in their ability to exhibit effective antibacterial activity when challenged with pathogenic bacteria. Because cannabinoid receptors are not found in significant numbers in the brain stem, cannabis is not considered to be a drug with fatal overdose risks.

Bibliography

- Adams, I., Martin, B. (1996), 'Cannabis: pharmacology and toxicology in animals and humans', *Addiction* 91: 1585–1614.
- Aguirell, S., Halldin, M., Lindgren, J., Ohlsson, A., Widman, M., Gillespie, H., Jollister, L. (1986), 'Pharmacokinetics and metabolism of Δ -9-tetrahydrocannabinol and other cannabinoids with emphasis on man', *Pharmacological Reviews* 38(1): 21–43.
- Ashton, H. (2001), 'Pharmacology and effects of cannabis: a brief review', *The British Journal of Psychiatry* 178: 101–106.
- Buchanan, B. E., O'Connell, D. (1998), 'Survey on cannabis resin and cannabis in unsmoked handrolled cigarettes seized in the Republic of Ireland', *Science and Justice* 39 (4): 221–222.
- Felder, C., Glass, M. (1998), 'Cannabinoid receptors and their endogenous agonists: review', *Annual Review of Pharmacology and Toxicology* 38: 79–200.
- de Fonseca, F. R., Del Arco, I., Bermudez-Silva, F., Bilbao, A., Cippitelli, A., Navarro, M. (2005), 'The endocannabinoid system: physiology and pharmacology', *Alcohol and Alcoholism* 40: 2–14.
- Gardner, E. (2002), 'Addictive potential of cannabinoids: the underlying neurobiology', *Chemistry and Physics of Lipids* 121: 267–290.

- Grotenhermen, F. (2003), 'Pharmacokinetics and pharmacodynamics of cannabinoids', *Clin Pharmacokinet* 42: 327–360.
- Hawksworth, G., McArdle, K. (2004), 'Metabolism and pharmacokinetics of cannabinoids,' in Guy, G., Whittle, B., Robson, P. (eds), *The medicinal uses of cannabis and cannabinoids*, London Pharmaceutical Press, London, 205–228.
- Howlett, A., Barth, F., Banner, T., Cabral, G., Casellas, P., Devane, W., Felder, C., Herkenham, M., Mackie, K., Martin, B., Mechoulam, R., Pertwee, R. (2002), 'International Union of Pharmacology XXVII. Classification of cannabinoid receptors', *Pharmacological Reviews* 54: 61–202.
- Howlett, A., Breivogel, C., Childers, S., Deadwyler, S., Hampson, R., Porrino, L. (2004), 'Cannabinoid physiology and pharmacology: 30 years of progress', *Neuropharmacology* 47: 345–358.
- Matsuda, L., Lolait, S., Brownstein, M., Young, A., Bonner, T. (1990), 'Structure of a cannabinoid receptor and functional expression of the cloned cDNA', *Nature* 346(6284): 561–564.
- Munro, S., Thomas, K., Abu-Shaar, M. (1993), 'Molecular characterization of a peripheral receptor for cannabinoids', *Nature* 365(6441): 61–65.
- Musty, R. E. (2004), 'Natural cannabinoids: interactions and effects', in Guy, G., Whittle, B., Robson, P. (eds), *The medicinal uses of cannabis and cannabinoids*, London Pharmaceutical Press, London, 165–204.
- Park, B., McPartland, J., Glass, M. (2004) 'Cannabis, cannabinoids and reproduction', *Prostaglandins, Leukotrienes and Essential Fatty Acids* 70: 189–197.
- Pertwee, R. (1999), 'Pharmacology of cannabinoid receptor ligands (review)', *Current Medicinal Chemistry* 6: 635–664.
- Roth, M., Baldwin, G., Tashkin, D. (2002), 'Effects of delta-9-tetrahydrocannabinol on human immune function and host defense', *Chemistry and Physics of Lipids* 121: 229–239.
- Tanda, G., Goldberg, S. R. (2003), 'Cannabinoids: reward, dependence and underlying neurochemical mechanisms – a review of recent preclinical data', *Psychopharmacology* 169: 115–134.

Chapter 4

Soma, the Wootton Report and cannabis law reform in Britain during the 1960s and 1970s

Keywords: 1960s – autobiography – the Beatles – cannabis – legislation
– lobbying – protest movements – social protest – sociology
– Wootton Report

Setting the context

This chapter provides a first-person account of a significant event in the history of cannabis policymaking in Europe: the publication of the UK's Wootton Report in 1969. There was some debate about whether to include this chapter in the monograph. The chapter is self-evidently personal in tone. Yet it is also interesting and anecdotal, and we believe the monograph benefits from its inclusion with few significant editorial changes. However, it should be read for what it is: an oral history, told from an individual's standpoint, with which others might disagree.

Recent literature has tended to play down the level of drug use in the 1960s. Prevalence statistics are not available, but cannabis use was likely much lower than today. A recent survey suggests that today's 50-somethings exaggerate their participation in 1960s counterculture in order to appear cool to their offspring. Nonetheless, several decades on, there is little doubt that the high-profile celebrities of the late 1960s still hold cultural resonance in today's global cannabis culture.

Nostalgia, anachronisms and the Beatles aside, Soma in many ways established the prototype for contemporary, often more fragmented, cannabis advocacy groups. It was a well-organised, erudite and media-aware pressure group. It had a talent for both publicity and linking debate to other contentious issues. Moreover, it was able to leverage the polarisation between political liberals and hardliners in the 1960s. Similarly, today there is sometimes political capital to be won from taking an extreme view, be it for or against cannabis use (see Hall, this monograph). The Soma campaign thus remains relevant to contemporary debate on cannabis.

In recent years, the nature of pro-marijuana activism and lobbying has been subjected to some study, amongst others by Calafat et al. (2000), Matthews (2003) and Iversen (2004). The key pro and con arguments have been summarised by Scheerer (1993) and Wodak et al. (2002). An analysis of recent government reports on cannabis, with specific reference to European legislative reforms, is provided by Ballotta et al. later in this monograph. Most recently, considerable discussion has focused on the potency of 1960s and 1970s cannabis vis-à-vis that available today. King explores this issue, and suggests that some of the more outlandish claims made of today's 'skunk' should be viewed with a critical eye.

Selected further reading on recent cannabis history and lobbying

- Adès, J-E., Gandilhon, M. (2007), 'Le cannabis dans le débat public et médiatique', in *Cannabis: données essentielles*, MILDT, Paris, 161–179.
- Calafat, A., Juan, M., Becoña, E., Fernández, C., Gil, E., Lopis, J. J. (2000), 'Estrategias y organización de la cultura pro-cannabis' in Calafat, M. and Bobes Garcia, M. (eds) (2000), *Monografía Cannabis*, Adicciones, Madrid.
- Charles, M., Britto, G. (2001), 'The socio-cultural context of drug use and implications for drug policy', *International Social Science Journal* 53: 3.
- Courtwright, D. (2001), *Forces of habit: drugs and the making of the modern world*, Harvard University Press.
- Iversen, L. (2004), 'Cannabis and the law — high time for reform?', *European Review* (2004) 12.
- Kohn, M. (1992), *Dope girls: the birth of the British drug underground*, Lawrence and Wishart, London.
- Matthews, P. (2003), *Cannabis culture: a journey through disputed territory*, Bloomsbury, London.
- Mold, A. (2006), "'The welfare branch of the alternative society?' The work of drug voluntary organization Release, 1967–1978' in *Twentieth Century British History* 17.
- Potter, M. (2000), 'Propaganja: the cannabis supporters and the Wootton Report 1967–1969', MA Dissertation in Propaganda, Persuasion and History, University of Kent.
- Rubin, V. (ed.) (1976), *Cannabis and culture*, Mouton Publishers, The Hague.
- Scheerer, S. (1993), 'Political ideologies and drug policy', *European Journal on Criminal Policy and Research* (1993) 1:1.
- Stephens, R. (2003), 'Drug use and youth consumption in West Germany during the 1960s', *Journal of Cultural Research* 7.
- Wodak, A., Reinerman, C., Cohen, P., Reinerman, C. (2002), 'For and against: cannabis control: costs outweigh the benefits', *British Medical Journal* 324: 105–108.

Soma, the Wootton Report and cannabis law reform in Britain during the 1960s and 1970s

Stephen Abrams

In April 1970 the British government introduced legislation which sharply reduced the penalties for simple possession of cannabis. This was done to implement a proposal by the Home Office Advisory Committee on Drug Dependence (the 'Wootton Report') that casual users of cannabis should not face the prospect of imprisonment. This reform, under new legislation (The Misuse of Drugs Act 1971) was a step in the direction of decriminalisation and marked a limited toleration of cannabis smoking.

Declaration of interest

The author of this chapter was head of the Soma Research Association (Soma (1)), which campaigned from 1967 for cannabis law reform. The article therefore expresses an insider's perspective on the reform process. On 24 July 1967 Soma set out its proposals for decriminalisation in a full-page advertisement in *The Times* (Figure 1). The issue was debated in Parliament and referred to the Hallucinogens Sub-Committee (the so-called 'Wootton Committee'(2)) of the Advisory Committee. In January 1969, the Home Office published the Advisory Committee Report on Cannabis, the so-called 'Wootton Report'. The report endorsed the proposals in the advertisement. The Home Secretary of the day denounced the report and the advertisement. However, a year later he introduced legislation to implement the main proposals of the report. This article describes the background to the appearance of the advertisement and describes the subsequent reform process up to 1979, when the Home Office advisors proposed the 'reclassification' of cannabis.

A brief history of cannabis convictions in the United Kingdom

Cannabis was prohibited in Britain in 1928 under the Dangerous Drugs Act, which remained in force during the 1960s. Under the Act, cannabis was classified as a

(1) Soma was chosen to have associations with the soma of the Rig Vedas, the nectar of the gods and the problematic tranquilliser in Aldous Huxley's novel *Brave New World*.

(2) The Advisory Committee on Drug Dependence was headed by Sir Edward Wayne, Professor of Practice of Medicine at the University of Glasgow. The 'Wootton' subcommittee on hallucinogens was led by Baroness Wootton of Abinger, a sociologist.

Figure 1: Advertisement in *The Times*, 24 July 1967

ADVERTISEMENT

This advertisement is sponsored by SOMA*

the law against marijuana is immoral in principle and unworkable in practice

The signatories to this petition suggest to the Home Secretary that he implement a five point programme of cannabis law reform:

- 1 THE GOVERNMENT SHOULD PERMIT AND ENCOURAGE RESEARCH INTO ALL ASPECTS OF CANNABIS USE, INCLUDING ITS MEDICAL APPLICATIONS.
- 2 ALLOWING THE SMOKING OF CANNABIS ON PRIVATE PREMISES SHOULD NO LONGER CONSTITUTE AN OFFENCE.
- 3 CANNABIS SHOULD BE TAKEN OFF THE DANGEROUS DRUGS LIST AND CONTROLLED, RATHER THAN PROHIBITED, BY A NEW AD HOC INSTRUMENT.
- 4 POSSESSION OF CANNABIS SHOULD EITHER BE LEGALLY PERMITTED OR AT MOST BE CONSIDERED A MISDEMEANOUR, PUNISHABLE BY A FINE OF NOT MORE THAN £10 FOR A FIRST OFFENCE AND NOT MORE THAN £5 FOR ANY SUBSEQUENT OFFENCE.
- 5 ALL PERSONS NOW IMPRISONED FOR POSSESSION OF CANNABIS OR FOR ALLOWING CANNABIS TO BE SMOKED ON PRIVATE PREMISES SHOULD HAVE THEIR SENTENCES COMMUTED.

Jonathan Aitken
Tariq Ali
David Bailey
Humphry Berkeley
Anthony Blond
Derek Boshier
Sidney Briskin
Peter Brook
Dr. David Cooper
Dr. Francis Crick,
F.R.S.
David Dimbleby
Tom Driberg, M.P.
Dr. Ian Dunbar
Brian Epstein
Dr. Aaron Esterson
Peter Fryer
John Furnival
Tony Garnett
Clive Goodwin
Graham Greene
Richard Hamilton
George Harrison,
M.B.E.
Michael Hastings
Dr. J. M. Heaton
David Hockney
Jeremy Hornsby
Dr. S. Hutt
Francis Huxley
Dr. Brian Inglis
The Revd. Dr. Victor
E. S. Kenna, O.B.E.
George Kiloh
Herbert Kretzmer

Dr. R. D. Laing
Dr. Calvin Mark Lee
John Lennon, M.B.E.
Dr. D. M. Lewis
Paul McCartney,
M.B.E.
David McEwen
Alasdair MacIntyre
Dr. O. D. Macrae-
Gibson
Tom Maschler
Michael Abdul Malik
George Melly
Dr. Jonathan Miller
Adrian Mitchell
Dr. Ann Mulry
P. H. Nowell-Smith
Dr. Christopher Pallas
John Piper
Patrick Procktor
John Pudney
Alastair Reid
J. Jeffrey Selznick
Nathan Silver
Tony Smythe
Michael Schofield
Dr. David Stafford-
Clark
Richard Starkey,
M.B.E.
Dr. Anthony Storr
Kenneth Tynan
Dr. W. Grey Walter
Brian Walden, M.P.
Michael White
Pat Williams

"All laws which can be violated without doing anyone any injury are laughed at. Nay, so far are they from doing anything to control the desires and passions of man that, on the contrary, they direct and incite men's thoughts toward those very objects; for we always strive toward what is forbidden and desire the things we are not allowed to have. And men of leisure are never deficient in the ingenuity needed to enable them to outwit laws framed to regulate things which cannot be entirely forbidden. . . . He who tries to determine everything by law will foment crime rather than lessen it."—Spinoza

The herb *Cannabis sativa*, known as 'Marihuana' or 'Hashish', is prohibited under the Dangerous Drugs Act (1965). The maximum penalty for smoking cannabis is ten years' imprisonment and a fine of £1,000. Yet informed medical opinion supports the view that cannabis is the least harmful of pleasure-giving drugs, and is, in particular, far less harmful than alcohol. Cannabis is non-addictive, and prosecutions for disorderly behaviour under its influence are unknown.

The use of cannabis is increasing, and the rate of increase is accelerating. Cannabis smoking is widespread in the universities, and the custom has been taken up by writers, teachers, doctors, businessmen, musicians, scientists, and priests. Such persons do not fit the stereotype of the unemployed criminal dope fiend. Smoking the herb also forms a traditional part of the social and religious life of hundreds of thousands of immigrants to Britain. A leading article in *The Lancet* (9 November, 1963) has suggested that it is "worth considering . . . giving cannabis the same status as alcohol by legalizing its import and consumption . . . Besides the undoubted attraction of reducing, for once, the number of crimes that a member of our society can commit, and of allowing the wider spread of something that can give pleasure, a greater revenue would certainly come to the State from taxation than from fines. . . . Additional gains might be the reduction of inter-racial tension, as well as that between generations."

The main justification for the prohibition of cannabis has been the contention that its use leads to heroin addiction. This contention does not seem to be supported by any documented evidence, and has been specifically refuted by several authoritative studies. It is almost certainly correct to state that the risk to cannabis smokers of becoming heroin addicts is far less than the risk to drinkers of becoming alcoholics. Cannabis is usually taken by normal persons for the purpose of enhancing sensory experience. Heroin is taken almost exclusively by weak and disturbed individuals for the purpose of withdrawing from reality. By prohibiting cannabis Parliament has created a black market where heroin could occasionally be offered to persons who would not otherwise have had access to it. Potential addicts, having found cannabis to be a poor escape route, have doubtless been tempted to try heroin; and it is probable that their experience of the harmlessness and co-operative quality of cannabis has led them to underestimate the dangers of heroin. It is the prohibition of cannabis, and not cannabis itself, which may contribute to heroin addiction.

The present system of controls has strongly discouraged the use of cannabis preparations in medicine. It is arguable that claims which were formerly made for the effectiveness of cannabis in psychiatric treatment might now bear re-examination in the light of modern views on drug therapy; and a case could also be made out for further investigation of the antibiotic properties of cannabidiolic acid, one of the constituents of the herb. The possibility of alleviating suffering through the medical use of cannabis preparations should not be dismissed because of prejudice concerning the social effects of 'drugs'.

The Government ought to welcome and encourage research into all aspects of cannabis smoking, but according to the law as it stands no one is permitted to smoke cannabis under any circumstances, and exceptions cannot be made for scientific and medical research. It is a scandal that doctors who are entitled to prescribe heroin, cocaine, amphetamines and barbiturates risk being sent to prison for personally investigating a drug which is known to be less damaging than alcohol or even tobacco.

A recent leader in *The Times* called attention to the great danger of the "deliberate sensationalism" which underlies the present campaign against 'drugs', and concluded that: "Past cases have shown what can happen when press, police and public all join in a manhunt

at a moment of national anxiety". In recent months the persecution of cannabis smokers has been intensified. Much larger fines and an increasing proportion of unreasonable prison sentences suggest that the crime at issue is not so much drug abuse as heresy.

The prohibition of cannabis has brought the law into disrepute and has demoralized police officers faced with the necessity of enforcing an unjust law. Uncounted thousands of frightened persons have been arbitrarily classified as criminals and threatened with arrest, victimization and loss of livelihood. Many of them have been exposed to public contempt in the courts, insulted by uninformed magistrates and sent to suffer in prison. They have been hunted down with Alsatian dogs or stopped on the street at random and improperly searched. The National Council for Civil Liberties has called attention to instances where drugs have apparently been 'planted' on suspected cannabis smokers. Chief Constables have appealed to the public to inform on their neighbours and children. Yet despite these gross impositions and the threat to civil liberties which they pose the police freely admit that they have been unable to prevent the spread of cannabis smoking.

Abuse of opiates, amphetamines and barbiturates has become a serious national problem, but very little can be done about it so long as the prohibition of cannabis remains in force. The police do not have the resources or the manpower to deal with both cannabis and the dangerous drugs at the same time. Furthermore prohibition provides a potential breeding ground for many forms of drug abuse and gangsterism. Similar legislation in America in the 'twenties brought the sale of both alcohol and heroin under the control of an immorally powerful criminal conspiracy which still thrives today. We in Britain must not lose sight of the parallel.

MEDICAL OPINION

"There are no lasting ill-effects from the acute use of marihuana and no fatalities have ever been recorded. . . . The causal relationship between these two events (marihuana smoking and heroin addiction) has never been substantiated, in spite of the once heated exchanges among members of the medical profession and between the medical profession and law enforcement officers there seems to be a growing agreement within the medical community, at least, that marihuana does not directly cause criminal behaviour, juvenile delinquency, sexual excitement, or addiction."

Dr. J. H. Jaffe, in *The Pharmacological Basis of Therapeutics*, L. Goodman and J. Gilman, Eds., 3rd Ed. 1963

"Certain specific myths require objective confrontation since otherwise they recurrently colour the issue, and incidentally divert the energy and attention of police and customs and immigration authorities in directions which have very little to do with facts and much more to do with prejudiced beliefs. The relative innocuousness of marihuana by comparison with alcohol is one such fact, its social denial a comparable myth."

Dr. David Sinden-Chalk, Director of Psychological Medicine, Guy's Hospital, The Times, 13 April, 1967

"Marihuana is not a drug of addiction and is, medically speaking, far less harmful than alcohol or tobacco. . . . It is generally smoked in the company of others and its chief effects seem to be an enhanced appreciation of music and colour together with a feeling of relaxation and peace. A mystical experience of being at one with the universe is common, which is why the drug has been highly valued in Eastern religions. Unlike alcohol, marihuana does not lead to aggressive behaviour, nor is it aphrodisiac. There is no hangover, nor, so far as it is known, any deleterious physical effects."

Dr. Anthony Storr, *Sunday Times*, 5 February, 1967

"The available evidence shows that marihuana is not a drug of addiction and has no harmful effects. . . . (The problem of marihuana) has been created by an ill-informed society rather than the drug itself."

Guy's Hospital Gazette, 17, 1963

"I think we can now say that marihuana does not lead to degeneration, does not affect the brain cells, is not habit-forming, and does not lead to heroin addiction."

Dr. James H. Fox, Director of the Bureau of Drug Abuse Control, U.S. Food and Drug Administration, *Quoted Campaigner*, Illinois News-Gazette, 23 August, 1966

"Cannabis is taken for euphoria, reduction of fatigue, and relief from tension. . . . (It) is a valuable pleasure-giving drug, probably most safer than alcohol."

Dr. Joel Fort, Consultant on Drug Addiction to the World Health Organization, Letter to School of Criminology, University of California, From Stan, Richard Ed., *Disorder* 1963

"(Smoking cannabis) only occasionally is followed by heroin use probably in those who would become heroin addicts as result without the marihuana."

Dr. L. Bauder, *Congressman*, 1963, 4, 131-134

DISCLAIMER—Signatures should in no way be taken to imply affiliation to SOMA or support of its aims or objectives.
*SOMA is applying for recognition as a company limited by guarantee with Charitable Trusts. It is being formed to examine without prejudice the scientific, medical, legal, moral, social, and philosophical aspects of legitimized mental awareness, with special reference to the effects of pleasure-giving drugs. SOMA will sponsor research and disseminate the results, promote and discuss the dangers of legitimized mental awareness and will publish its findings. Contributions can now be accepted. Questions and postal orders should be made payable to SOMA, and sent to Michael Hombach, Accountants, 26, Fitzroy Square, W.1.

narcotic and offences were subject to penalties essentially identical to those for heroin and cocaine. The maximum penalties were one year on summary conviction and 10 years on indictment ⁽³⁾. No distinction was made between possession and supply, and most offenders were sent to prison. On the other hand, up to the mid-1960s enforcement was lax and directed mainly at black immigrants from the Caribbean. The first year in which a minority of offenders (48%) were imprisoned, 1964, was also the first year in which white offenders outnumbered black offenders (UK Home Office, 1968).

During the 1950s there was little evidence of increased use of cannabis in the United Kingdom. In 1951 there were 127 convictions and this figure was not exceeded until 1959, when it rose to 185. A plateau of about 600 convictions was reached in 1962 and not exceeded until 1966, when a figure of 1 119 was reached. In 1967 convictions doubled again to 2 393. That year the total seizures by police and customs amounted to 295 kg and 457 plants. For a comparison, 30 years later, in 1997, the year of peak enforcement, seizures amounted to about 150 000 kg and 115 000 plants (The Police Foundation, 2000), an increase by a factor of 500 and 250 respectively.

1967: a watershed year for cannabis

Witnesses heard by the Wootton subcommittee in December 1967 variously estimated the prevalence of cannabis use at between 30 000 and 300 000 persons. Perhaps the lower figure corresponds roughly to the number of regular users at the beginning of the year. However, there must have been a very dramatic increase in cannabis smoking in 1967, when the subject was widely and favourably publicised. By the end of the decade, a government-funded study indicated that nearly a million people had tried cannabis ⁽⁴⁾. The scale of cannabis use had by then probably reached a level where it was self-sustaining and could not be moderated by widespread enforcement. The sanction of imprisonment was still applied in a quarter of cases heard in 1967, the great majority of them for simple possession of small quantities. Seventeen per cent of first offenders were imprisoned (UK Home Office, 1968). The possibility of jailing tens, if not hundreds of thousands, of people for minor cannabis offences was both unthinkable and quite impractical.

In the first half of the 1960s in the United Kingdom, cannabis smoking was a feature of the half-world, where it was used by jazz musicians, artists and writers and, increasingly, in the universities. In January 1967 an article estimated that 5% of Oxford

⁽³⁾ 'Summary conviction' means conviction in a magistrates court. Cases of possession for personal use would normally be heard in a magistrate's court. If the accused elected trial by jury the case would be heard in a Crown court and higher penalties would apply.

⁽⁴⁾ A survey by Market Advertising and Products Study Ltd (MAPS), commissioned in 1969 by the Home Office and the Registrar General's Office of Population Synthesis and Survey.

undergraduates smoked pot from time to time (Abrams, 1967). This converted into a figure of 500 and was debated in the broadsheet newspapers. At the instigation of the Oxford Committee on Student Health, the Vice Chancellor wrote to the then Home Secretary Roy Jenkins on 28 February, asking him to commission a national inquiry into cannabis and LSD (UK Home Office, 1968). This led to the appointment on 7 April of the Hallucinogens Sub-Committee (the so-called 'Wootton Committee') of the Advisory Committee on Drug Dependence.

Up to the beginning of 1967, cannabis received little publicity and nearly all of this was negative. Though prevalence remained low, cannabis use among 1960s celebrities and pop stars served to publicise the substance. For example, the arrest of the Scottish singer Donovan in mid-1966 was widely reported. Following a denunciation in the mass circulation newspaper *the News of the World*, Mick Jagger and Keith Richards of the Rolling Stones were arrested in February 1967 and sent for trial at the end of June for minor drugs offences. On 1 June 1967 the Beatles, at the zenith of their creative power and influence, released their *Sgt. Pepper* album, which was saturated with references to cannabis and LSD. The last track, 'A Day in the Life' ⁽⁵⁾, was banned from airplay on the BBC. The Beatles, and Paul McCartney in particular, were advocates of LSD: a serious confrontation was brewing between fashionable alternative society and the Establishment.

Soma was looking for a way to put the topic of cannabis law reform on the political agenda, and also to influence the terms of the deliberations of the Wootton Committee. In particular, the aim was to persuade the subcommittee to report on cannabis alone, rather than in conjunction with LSD. This in turn was based on the assumption that there was a consensus of informed opinion that cannabis was less harmful than stimulants, sedatives and alcohol and confidence that the committee would discover this for themselves. The gesture which occurred to me was to take a page of *The Times* newspaper for a paid advertisement in support of the decriminalisation of cannabis. The advertisement would draw its force from a number of influential people who would put their names to it. Barry Miles ⁽⁶⁾ mentioned this proposal to Paul McCartney on 2 June. McCartney immediately realised that the advertisement would have the effect of switching the focus from LSD to cannabis and associating the Beatles with prominent authorities in a legitimate protest 'within the system'. Following a meeting between McCartney, Miles and myself on 5 June, the Beatles agreed to add their names to the

⁽⁵⁾ The song's lyrics include the lines 'Found my way upstairs and had a smoke/Somebody spoke and I went into a dream'.

⁽⁶⁾ Barry Miles was an author and co-runner of London's Indica bookshop and gallery, later biographer of Allan Ginsberg and Paul McCartney.

advertisement and McCartney guaranteed the funding, finally credited to a Beatles advertising account (7).

At the end of June, as the preparation of the advertisement neared completion, Mick Jagger and Keith Richards were convicted and sentenced to imprisonment. There was a public outcry, including three nights of demonstrations in Fleet Street against the newspaper *the News of the World*, who were accused by Michael Havers, Jagger's counsel, of sending in an agent provocateur. After spending two nights in prison, Jagger and Richards were released on bail on 30 June. Jagger had been sentenced to three months for possession of amphetamines and Richards was sentenced to a year for the 'absolute' offence that cannabis had been smoked at his home, with or without his knowledge (8).

On the following day, 1 July, *The Times* published a famous leading article with the felicitous title, 'Who breaks a butterfly on a wheel?'. This leader has been much misunderstood, not least by its author, William Rees-Mogg, who claims that it 'helped to get Jagger out of prison on a minor drugs charge' (9). Also, the official history of *The Times* says that the leader was delivered to Jagger in prison by a warder with the advice that he would soon be freed on bail (10). As mentioned above, Jagger was freed a day before the leader appeared. Many, if not most, accounts of the case, including the most recent one in *The Times* and others in *The Guardian*, *The Independent* and on the BBC, assert that Jagger was convicted of possession of cannabis (11). Rees-Mogg's leader made it clear that he considered amphetamine to be a 'soft' drug and Jagger's offence to be trivial. However, he seemed to regard cannabis as a dangerous narcotic and was not, therefore, prepared to question the sentence of a year in prison for Richards. *The Times* got cold feet and postponed the publication of the advertisement, which finally appeared on 24 July. In the interim, a *Legalise Pot Rally* was held in Hyde Park on 16 July, attended by 10 000 people, marking the colourful advent of 'flower power'. Most national newspapers covered the event with a two-page spread. There were no arrests.

(7) B. Miles, *Paul McCartney: many years from now*, Secker & Warburg, London, 1997, pp. 386–395; S. Abrams, 'The Wootton Retort'; D. Taylor, *It was twenty years ago today*, Bantam Press, London, 1987, pp. 122–127.

(8) T. Hewat (ed.), *Rolling Stones file: the trials of Mick Jagger and Keith Richards*, Panther Record, London, 1967, p. 128.

(9) In a news article, 'We've got to face it, Britain's gone to pot' (*The Times*, 2 July 2001), Lord Rees-Mogg finally expressed the view that 'prohibition has not proved to be the answer'.

(10) John Grigg in *The Times Magazine*, 30 October 1993, p. 39.

(11) Lewis Smith in *The Times*, 2 August 2005: [Jagger was] convicted of possessing cannabis in 1967 in a case that became a cause célèbre when first he was jailed for a year and then freed on appeal three days later after a leading article in *The Times* headlined 'Who breaks a butterfly on a wheel'.

Paragraph 2 of the Wootton Report reads:

Our first enquiries were proceeding — without publicity — into the pharmacological and medical aspects, when other developments gave our study new and increased significance. An advertisement in *The Times* on 24th July, 1967 represented that the long-asserted dangers of cannabis were exaggerated and that the related law was socially damaging, if not unworkable. This was followed by a wave of debate about these issues in Parliament, the Press and elsewhere, and reports of enquiries, e.g. by the National Council for Civil Liberties. This publicity made more explicit the nature of some current ‘protest’ about official policy on drugs; defined more clearly some of the main issues in our study; and led us to give greater attention to the legal aspects of the problem. Government spokesmen made it clear that any future development of policy on cannabis would have to take account of the Advisory Committee’s Report. Accordingly, we decided to give first priority to presenting our views on cannabis.

The advertisement in *The Times* (Figure 1) was published by the Soma Research Association and signed by 65 people, including the Nobel Laureate Francis Crick, novelist Graham Greene, 15 doctors of medicine, one member of the Wootton Committee, members of Parliament and the Beatles ⁽¹²⁾. The advertisement was the subject of an adjournment debate in Parliament in the week of its appearance (on 28 July), when the Minister of State referred the issue to the Wootton Committee ⁽¹³⁾. The Wootton Report was submitted on 1 November 1968 and published in January 1969.

The advertisement in *The Times* described the existing law as ‘immoral in principle and unworkable in practice’ but it stopped short of advocating the legalisation of cannabis. Instead, it proposed that users of cannabis should not face the prospect of imprisonment. Specifically, the advertisement said that possession of a small amount should not be punished by anything more than a relatively small fine of £25. The question of supply was ignored. This position has become known as ‘decriminalisation’.

The Advisory Committee Report included many echoes of the advertisement, that:

(...) The long term consumption of cannabis in moderate doses has no harmful effects (...) Cannabis is less dangerous than the opiates, amphetamines and barbiturates, and also less dangerous than alcohol. (...) An increasing number of people, mainly young, in all classes of

⁽¹²⁾ The Soma Research Association was founded in January 1967, incorporated in 1969 and disbanded in 1971. The directors were Dr David Cooper; Francis Crick, FRS; Francis Huxley; Dr R. D. Laing; The Rev. Kenneth Leech; Dr Anthony Storr; Professor Norman Zinberg and the present writer. The secretary, from 1968, was Don Aitken. Staff included Adam Parker-Rhodes, pharmacologist; Dick Pountain, chemist; Derek Blackburn, psychologist; and Sam Hutt and Ian Dunbar, physicians. Premises (in London) were at 438 Fulham Road (from 1968) and 4 Camden High Street (from 1969). Soma was funded by private donations and subscriptions. The total expenditure did not exceed £5000. This figure does not include the cost of advertisement, which was £1800.

⁽¹³⁾ On 31 July the Court of Appeal quashed Richards’s conviction. This was remarkable because Richards had no case to argue. However, the court ignored the fact that the premises offence was ‘absolute’. Jagger’s conviction was upheld but he was let off with a conditional discharge.

society are experimenting with this drug, and substantial numbers use it regularly for social pleasure. There is no evidence that this activity is causing violent crime, or is producing in otherwise normal people conditions of dependence or psychosis requiring medical treatment (...) there are indications that (cannabis) may become a functional equivalent of alcohol.

The burden of proof thus passed from the campaigners to the government's own expert advisors; and this was regarded by many as a green light for the consumption of cannabis. The Advisory Committee appeared also to accept the principle of decriminalisation. The main proposal in the report was that 'possession of a small amount of cannabis should not normally be regarded as a serious crime to be punished by imprisonment'. The accompanying letter of submission to the Home Secretary said: 'The committee is generally of the view that imprisonment is no longer an appropriate punishment for those who are unlawfully in possession of a small amount.'

The Home Secretary of the day, James Callaghan, suggested he would reject the report. He told Parliament that on his reading, the committee had been 'over-influenced' by the 'lobby' for 'legalisation' responsible for 'that notorious advertisement', adding, 'it was wrong for the committee to report on one drug in isolation in the way that it did' ⁽¹⁴⁾. However, a year later he introduced comprehensive new consolidating legislation that had the effect of implementing Wootton's proposal ⁽¹⁵⁾.

Callaghan's Misuse of Drugs Bill increased the penalties for most drugs offences, including trafficking in cannabis. However, this legislation introduced a distinction not drawn by Wootton between penalties for use and supply. The penalties for possession of cannabis were sharply reduced, by 50%, to five years on indictment and six months on summary conviction. The Wootton Report noted that offences with a maximum sentence on summary conviction of six months or less were not normally punished by imprisonment, and that such sentences as were passed were suspended as a matter of routine. They opted for a maximum sentence on summary conviction of four months.

Callaghan's legislation perished in the General Election of 1970. However, it was soon reintroduced by the incoming Conservative government and became law as The Misuse of Drugs Act (1971). When the act received the Royal Assent in 1973, the Lord Chancellor, Hailsham, instructed magistrates on sentencing. He said, 'Set aside your prejudice, if you have one, and reserve the sentence of imprisonment for suitably flagrant cases of large scale trafficking' ⁽¹⁶⁾.

⁽¹⁴⁾ *Hansard*, 27 January 1969.

⁽¹⁵⁾ One account suggests James Callaghan got cold feet and tried at the last moment to alter the legislation, but he was outvoted in cabinet: entry for 26 February 1970 in A. Howard (ed.) (1979), *The Crossman Diaries*, London.

⁽¹⁶⁾ *The Times*, 12 October 1973.

The operation of the new law in its first four years was made the subject of a special in-depth statistical analysis by the Advisory Council on the Misuse of Drugs (ACMD), prepared in December 1978 and published in 1979 ⁽¹⁷⁾. This study showed that the law was working as intended and that, with a handful of exceptions, the courts had abandoned custodial sentences for cannabis users. During this period, there was a further reduction, under the Criminal Justice Act (1977), of 50% in the maximum sentence on summary conviction, to three months' imprisonment, one month less than the maximum proposed by the Wootton Report.

Subsequently, in 1978 the Advisory Council on the Misuse of Drugs (the successor to the Advisory Committee) proposed to 'reclassify' cannabis, moving it to the weakest of three punishment regimes. It took 25 years to implement this recommendation. However, in the 1980s the Thatcher government moved sharply in the direction of decriminalisation by introducing 'cautioning': an offender who was cautioned would escape without a fine or a criminal conviction. By the beginning of the 1990s, the majority of minor cases were dealt with by means of the caution, so that in 1992, when *The Times* itself came out in support of legalisation, on the 25th anniversary of the Soma advertisement, the leader could conclude that the law was 'all but unenforced'.

In 2000 the question of reclassification was revived in the Report of the Independent Police Foundation Inquiry. In response, the Home Secretary sought advice from the Advisory Council and from the House of Commons Select Committee on Home Affairs (see Ballotta et al., this monograph). The interesting point, perhaps, is that all three bodies stressed that the importance of reclassification (which did not directly affect the penalty on summary conviction) was that it demonstrated the fact that cannabis is less dangerous than amphetamine. With the reclassification of cannabis — where there is a 'presumption not to arrest' reasonably discreet adult users of cannabis — there has thus been a complete reversal of the assessment of the relative dangers of these two drugs in the 1960s. It is worth adding, perhaps, that Paul McCartney and Mick Jagger were both eventually convicted of cannabis offences, for which they received small fines. Today, Sir Paul McCartney and Sir Michael Jagger have received knighthoods.

⁽¹⁷⁾ Advisory Council on the Misuse of Drugs (1978) – *Report on a review of the classification of controlled drugs and of penalties under schedules 2 and 4 of the Misuse of Drugs Act 1971*, 15 December 1978. This proposal also called for the law to be recast to remove the sanction of imprisonment on statutory conviction for possession of cannabis.

References

- Abrams, S. (1967), 'The Oxford scene and the law', in Andrews, G., Vinkenoog, S. (eds) (1967), *The book of grass*, Peter Owen, London, 235–242.
- Abrams, S. (1997), 'The Wootton Retort: the decriminalization of cannabis in Britain', privately circulated, available from Drugscope and the Internet.
- The Police Foundation (2000), *Drugs and the law: report of the independent enquiry into the misuse of drugs act*. Published by The Police Foundation, London.
- UK Home Office (1968), *Cannabis: report by the advisory committee on drugs dependence* (The 'Wootton Report'), Home Office, HMSO, 1968.

Chapter 5

Cannabis's role in drawing attention to 'the drugs problem' in Sweden

Keywords: cannabis – jazz musicians – media coverage – moral panic – Sweden

Setting the context

In many aspects of government the 'Swedish model' is held up as a paradigm. Sweden is often cited as proof that a distributionist welfare state can co-exist with a strong market economy. Although Sweden is not immune to social problems, the country's 9 million inhabitants are able to boast an impressive record within EU countries on many health indicators.

So how does Sweden look in terms of cannabis and illicit drugs? Sweden promotes a vision of a 'drug-free society' at policy level. It recently appointed a National Drug Policy Coordinator to espouse what it terms a 'restrictive and humane strategy', and in September 2006 its drug policy was singled out for praise from the UNODC in a report which concluded that the country's vision of a drug-free society 'has not been found to be obsolete or misdirected' (UNODC, 2006).

Cannabis prevalence rose in Sweden in the early 2000s, particularly among youths, and was reported as 'very worrying' in a Swedish government report (Ramström, 2004). Reported last month prevalence among young people rose from 1.3% in 2000 (16- to 34-year-olds) to reach 5.3% in 2004 (18- to 34-year-olds) and dropping to 4.8% in 2005 (16- to 34-year-olds) (EMCDDA, 2006). Sweden has also observed a general increase in the tested potency of cannabis, and anxiety has been expressed about increases in treatment admissions. In 2007, the Swedish Rikskriminalpolisen published a report that suggested that the cannabis market is larger than previously thought: 25–30 tonnes per year, with around 140 cannabis smuggling networks operating. Nonetheless, at 2.9%, cannabis prevalence among young people in Sweden (15- to 24-year-olds) remains the third lowest in EMCDDA reporting countries, after Greece and Lithuania.

This chapter studies cannabis's cultural role in what sociologists term a *moral panic* about drug use in Sweden. It examines the evolution of drug use from almost a non-issue to a highly debated cultural construct. Its extracts from contemporary media reports with a salacious tone suggest that Europe was no stranger to the much-ridiculed 'reefer madness' campaigns of 1930s America.

It is interesting to note how responses to drug use evolved to embrace a moral and welfare-related approach as opposed to a medicine- or psychotherapy-based focus. While in Sweden the vision of a drug-free society has been able to gain political legitimacy, in many other countries more pragmatic approaches have been adopted. Today, decades after the reports quoted in this chapter, stories about drug use — particularly among youths, celebrities, musicians, criminals and clubbers — still retain a hold over the public imagination.

Further reading

The politicisation of cannabis and drugs

Goode, E. (1970), *The marijuana smokers*

www.druglibrary.org/special/goode/mjismokers.htm

Goode, E., Ben-Yehuda, N. (1994), *Moral panics: the social construction of deviance*, Blackwell, London.

Maccoun, R., Reuter, P. (2001), *Drug war heresies*, Cambridge University Press, Cambridge.

Schlosser, E. (2003), *Reefer madness and other tales from the American underground*, Penguin Books, London.

Walton, S. (2002), *Out of it: a cultural history of intoxication*, Harmony Books, New York.

Swedish drug policy

Boekhout van Solinge, T. (1997), *The Swedish drug control system: an in-depth review and analysis*, Cedro, Amsterdam.

Ramström, J. (2004), *Adverse health consequences of cannabis use*, National Institute of Public Health, Sweden.

Swedish National Drug Policy Coordinator (2003), *Is Cannabis a Harmless Drug?*, Stockholm.

UNODC (2006), *Sweden's successful drug policy: a review of the evidence*, United Nations Office on Drugs and Crime, Vienna.

Cannabis's role in drawing attention to 'the drugs problem' in Sweden

Börje Olsson

World illicit drug consumption has increased substantially since the beginning of the 1990s. The annual number of users of all illicit drugs ⁽¹⁾ in 2007 was estimated at about 200 million people. For cannabis, the corresponding number is 158.8 million, compared with 24.9 million for amphetamines, 15.6 million for opiates, 14.3 million for cocaine and 8.6 million for ecstasy (UNODC, 2007).

Even if cannabis is by far the most frequently and widely used drug, the bulk of problems related to illicit drug use is linked to other substances, such as heroin and cocaine. In this respect, cannabis use is a subordinate issue, but in present and past policy controversies cannabis plays, and has played, a central role. Why is this so? This chapter focuses on the role of cannabis in the 'cultural construction' of the modern drug problem in Sweden. It aims to discuss cannabis's central role, and to provide tentative answers.

The modern idea of 'a drug problem' developed fairly simultaneously in many Western societies in the late 1960s. It was characterised by an increased prevalence in groups not previously associated with drug use, and as a particular phenomenon that was distinct from previous, medical drug use. While historically cannabis experienced some pharmaceutical usage, it largely disappeared from legal medical practice in Western Europe before the Second World War (see Fankhauser, this monograph). A number of factors contributed to drugs being viewed as a problem: (i) recreational cannabis use as an intoxicant among 'exclusive' or 'deviant' groups as jazz musicians and other artists; (ii) claims that cannabis caused crime, mental illness and in severe cases even death; and (iii) the fact that synthetic preparations considered more effective than cannabis were invented, for example barbiturates and painkillers such as aspirin (Russo, 1998; Mack and Joy, 2000; Grotenhermen, 2002). Compared to many other substances which today are common on the illicit drug market — for example morphine and other opiates — cannabis was fairly easily ruled out from legal medical practice. Yet these medicinal substances continued to experience extensive, often highly praised use in

⁽¹⁾ The number of people who have consumed an illicit drug at least once in the 12 month period preceding the assessment.

regular medicine and as long as the users were seen as patients in need of treatment, drug use as a social problem was not an issue (Olsson, 1994; see also Fankhauser, this monograph).

Cannabis use played an extraordinarily important role in the process where drug use developed into a social problem in modern societies. This might seem odd considering its relatively mild effects and limited harms vis-à-vis opiates. As will be discussed, this paradox can be explained. In fact, it is doubtful whether our views on drugs and the policies developed upon them would have looked the same if cannabis had not existed. This general question will be discussed by taking its point of departure at the time of the Second World War and in one specific country, Sweden.

Though a prerequisite, the mere existence of drugs is not sufficient to create a drug problem. But to understand the roots of the 'modern' drug problem in Sweden, it is nevertheless a good starting point to turn to the introduction of amphetamines as pharmaceutical preparations towards the end of the 1930s. They were introduced for medical purposes and, as usual, the new medicament was praised as efficient, without side-effects and suitable for a variety of problems, such as narcolepsy, epilepsy, depression, psychosis, fatigue, excessive weight and obesity (Goldberg, 1944).

Amphetamines or similar drugs that stimulate the central nervous system rapidly became popular and their use spread to a significant proportion of the Swedish population. It has been estimated that in 1942–3 there were about 200 000 users of amphetamines in the country, corresponding to 3% of the adult population (a proportion that exceeds today's amphetamine prevalence by 5 to 10 times). Even if the majority were occasional users, nearly 10 000 used them as frequently as between once a week to several times a day, and many in the latter group did so in extremely high dosages (Goldberg, 1968). Despite this, there were no signs of constructing drug use as a social problem. On the contrary, the privilege to formulate drugs as a problem was still solidly contained within the medical field. When drug use was perceived as a problem, it was as an individual disease suitable for the family doctor to treat (Olsson, 1994).

Multiple Swedish government investigations during the 1950s concluded that drug use offered little cause for alarm. Conclusions were drawn that there was appreciable prevalence in amphetamine (3%, Goldberg, 1968) and opiate use, although these were predominantly used by well-adjusted citizens for medical or therapeutic purposes (Medicinalstyrelsen, 1956). Moreover, incidences of opiate addiction could be best treated by a family doctor (Olsson, 1994). Although there was some acknowledgement of the threat of amphetamines, heroin (Bejerot, 1969) and cannabis, particularly to young users, reports on 'societal risks' — for example those associated with intravenous heroin use — drew predominantly on case studies outside Sweden. Furthermore, attempts to link problem drug use to subcultural groups by the Liberal Party MP

Rimmerfors were met with scepticism (Rimmerfors, 1954, 1958). In short, drug problems were generally perceived as alien to Swedish society. Swedes were using drugs for medicinal, not mind-altering, effects.

However, towards the end of the 1950s discussions appeared in which drug use as a social problem started to be identified and defined. The reasons behind this had little to do with the extensive oral use of amphetamines or morphine among well-integrated persons. What the public discourse started to pay attention to were three other phenomena: (i) drug use among musicians and artists; (ii) the link between these groups and youths; and (iii) a few years later drug addiction among marginalised groups. The first two received the most attention in the media. Amphetamines and cannabis use among musicians and other artists were perhaps the most frequently highlighted in the press. Limited use of morphine was also reported. Half a century after these reports and descriptions were published in newspapers, it is evident that one of the most distinguishing features in them was a strong tone of moral condemnation. This is true not only for drug use and drug users but also for the kind of lifestyle these artists represented. The following article illustrates this.

A lot has been written about the historical roots and developments of American jazz music. Unfortunately, the historical writing has been blind to the dark sides of jazz music and only focused on its charming, exciting and positive aspects (...) but the rush, stress and the increased competition between top musicians and, not least, unscrupulous managers have provided musicians and artists with an illusory substance that overcomes fatigue, increases the performance capacity at the same time as it turns them into slaves under the most dangerous vice that exists, drug addiction. (...) Youths talented for the profession as musicians worship the American stars as they were gods, and they try to imitate them at any prize. They make contacts at frequent guest performances and young Swedes get enthusiastic descriptions of how improvisation and other forms of liberation is amplified simply by smoking one joint of marihuana.

(*Aftonbladet*, 11 April 1954: author's translation)

The article highlights several aspects of the drug problem that were important in forming the general perceptions of drug use/misuse/addiction. In absolute numbers, the groups referred to involved only a few persons frequenting certain clubs and bars in the 'Old Town' of Stockholm, while the much larger group of persons using amphetamines were hardly given any attention. The quotation also indicates one of the main reasons why anxiety about drugs was soon to escalate, namely the clear link that was established between this exclusive group of American musicians and young Swedes. The anxiety was further increased through repetitive descriptions in other articles that appeared concerning promiscuous young girls and drugs.

It is well known to social workers that the mean age among female prostitutes in Stockholm is constantly decreasing. The influx of 16 to 20 year old girls is presently big. It involves teenage girls who have a history of being regular frequenters of obscure dance halls where they have established contacts with mediocre artists who have provided them with drugs.

(*Aftonbladet*, 7 November 1954: author's translation)

From 1954 onwards, the link between drug use and youth in media becomes more and more evident. Also, well-adjusted young people are described in the context of drugs and drug use, making it possible for any parent to identify with the narratives presented.

Daily, dozens of teenagers hang out at cafés. It is schoolchildren, often from well-off families, who without further ado skip school and homework, who drift about in gangs, who pretend they are Bohemians, poets, and drug users. Among the most advanced groups of youth in Stockholm, it has come into fashion to smoke hashish or marijuana or to get high on Phenedrine and sleeping-pills.

(*Arbetaren*, 24 February 1954: author's translation)

Certain important features that have become central to how the Swedish drug problem later was conceived and defined were thus already present in 1954. Among the most important were the dominant perception of drugs as something alien to Swedish culture ⁽²⁾ and drugs as a serious threat to young people. At the same time, less attention was paid to the medically initiated use of drugs among somewhat older, ordinary citizens, and the fact that amphetamine use was already spreading among older criminals was not yet noticed. In other words, the portrayal of cannabis as a threat was both pronounced and distinct, but in reality did not yet live up to the legend. Even if jazz musicians, certain other groups of artists and a number of young people in their circles were given a prominent place in media narratives of drug use, their numbers were still very limited and an overwhelming majority of Swedes never had any contacts with drug users.

A simultaneous development took place which eventually would develop into the factual core issue in the Swedish drug problem: amphetamine use — in particular, amphetamines used intravenously — among established criminals. Due to reasons which are beyond the scope of this chapter, this unique form of drug use became extremely widespread in criminal circles. To some extent this process started already during the early 1950s, but it was not until the end of the decade and during the early 1960s that this pattern, peculiar to Sweden, really took off. As increased amphetamine use among criminals became evident, the controls of these substances also were made more stringent. Amongst other developments, by 1960 all amphetamine-like substances were included in the national list where narcotic drugs were classified. The legal channels to obtain access to these drugs were successively blocked, which led to an increasing number of drug crimes as the number of misusers and addicts continued to increase. This triggered a series of control measures such as, for instance, the setting up of a specific drug prosecutor and a police drug squad, together with a successive sharpening of drug legislation. At the same time, the legal consumption of narcotic drugs dropped to a fraction of its previous levels (Olsson, 1994).

⁽²⁾ Drugs as an alien element in Swedish society and culture has later been analysed by Tham (1995).

To summarise, taken together these three phenomena had a great impact on how the definition of the 'modern' drug problem developed and which drug policy was to be implemented. A crucial factor was that drug use (outside legal medical use) was something novel and unknown to Swedish society and culture, and to which frightening properties were attributed through references to intravenous heroin addiction in other countries. The image of drugs as a serious threat increased significantly due to the links made to ordinary youths running the risk to be drawn into the slavery of addiction. Also, and in sharp contrast to earlier images of the more familiar and legal medical use of drugs, clear links were outlined between drug use at the one hand and criminality and marginalisation at the other, as a result of the actual, visible and widespread amphetamine use among criminals.

As far as cannabis is concerned, thus far we can draw a tentative conclusion. Seen in isolation the actual prevalence of the substance played only a limited role in how basic perceptions and definitions of the drug problem originally were formulated in Sweden. Cannabis instead played an important role in adding strong moral and legal 'spin' to Swedish drug policy. It was portrayed as strange, unknown, alien, exotic and frightening and, in contrast to, for instance, opiates, there was hardly any lingering 'normal' medical use of cannabis after the Second World War. This concept of deviance was strengthened by the fact that people had almost solely to rely on illegal channels to obtain cannabis. Furthermore, the mind-altering effects of cannabis were unfamiliar to the 'normalised' intoxication culture in Sweden, that is to get drunk on alcohol. Empirical definitions of the substance in the medical field were held back by the absence of reporting of negative effects of cannabis in the medical literature. Such a 'knowledge vacuum' enabled moralists to step in and approach cannabis in alarmist terms. So public interest was weighted towards moral, legal and social aspects of cannabis use and the threat to young people that cannabis was seen to constitute. This weighting had a great impact on the process where not only cannabis, but drugs in general, grew to become a disproportionate public problem that required a response at the policy level.

By 1965 the situation around drugs had matured to the extent that all necessary prerequisites were at hand for the government to delineate what was to become a fundamental aspect of Swedish drug policy. A government commission was appointed to conduct the first comprehensive investigation into the drug situation in Sweden. The commission worked for four years and published four thick volumes ⁽³⁾ in which, apart from the articulation of negative moral perceptions, priority was given to the legal and social aspects of drug use. Control, prevention and treatment were from the beginning the main pillars in the model which later became one of the most restrictive in Europe. It is interesting to note that the legal and social aspects were not only dominant in the two first pillars, but also in the third, treatment. In contrast to many

⁽³⁾ SOU 1967, 25; SOU 1967, 41; SOU 1969, 52; SOU 1969, 53.

other countries, the Swedish drug treatment system was built outside the medical sphere and to a large extent based on principles that do not constitute medical treatment. The overall responsibility for providing drug treatment was placed upon the social welfare system and many of the specific treatment methods utilised had strong moral and social components. Apart from a small experiment with methadone treatment, all treatment activities were drug-free and aimed at total abstinence from drugs. The role of medical authorities was limited to handling complications related to drug use and to providing detoxification before the patients were transferred to long-term treatment provided by the social welfare system, which was preferred to institutional treatment. A distinctive feature of Swedish drug treatment was that, at least during its first 15 years, drug use was perceived as a symptom of severe social and psychological problems and that treatment, therefore, should focus more on what caused the symptom than on the symptom itself. Both laymen and non-experts were given an important role in treatment, reflected by the very strong influence of treatment institutions run by NGOs (Socialstyrelsen, 1973).

A striking example, which serves to illustrate the strong legal, moral and social dimensions of drug policy, is the development of an influential form of institutional drug treatment model for youths in Sweden, which has become known as the 'Hassela pedagogic' (named after the village where the first institution was set up in 1969). This model — where one of the foundations is 'medlevarskap' (living together), meaning that clients and staff live together round the clock — put young addicts for a considerable period of time in a permanent and stable group of adults to work and study. Such firm fostering is a key concept in the model: adolescents are strictly reminded of 'forgotten basics' such as good friendship, solidarity with the group and respect for work. The 'Hassela pedagogic' goes against the grain of the concept of therapy in the sense that treatment is explicitly rejected and the focus is instead on education and fostering pupils (the term used instead of clients or patients) into decent, well-integrated and hard-working citizens (Tilander, 1991). It should also be noted that the majority of young addicts in this form of institution are treated compulsorily as a result of a legal decision (Bergmark et al., 1989).

This particular form of treatment had a significant impact on treatment models and methods for adults when they were designed and it is one of many examples of the strong legal, moral and social dimensions of Swedish drug policy. As has been shown, this architecture was rapidly constructed once drug use was recognised as a public problem and already before the advent of the 1970s, the foundation was laid for a policy that has remained unaltered if we consider the basic perceptions of drug use. It is true that drug policy became gradually more restrictive over the years and that numerous repressive measures were introduced, but this cannot be seen as a redefinition of the perceptions, but rather as a quantitative change where more weight was placed on the control side of drug policy (Lenke and Olsson, 2002).

Some of the conclusions, at least tentatively drawn in this chapter, contradict popular understandings of how drug use developed in Sweden and how the drug problem was formulated. Maybe the most popular belief is that the Swedish drug problem took off when different youth cultural trends (hippies, flower power, etc.) spread around the world towards the end of the 1960s (see Abrams, this monograph). In these cultures drugs, and especially cannabis, played an important role. A closer look at the Swedish situation shows that drug use related to these types of youth cultures was hardly a new drug epidemic. Certainly, cannabis use among young people became more common from about 1965–7, but the prevalence figures which were reached were still modest and restricted to limited circles, in particular the major cities. Furthermore, for a vast majority of young people drug use was confined to trying cannabis once only or experimenting with the substance a few times (SOU, 1969: 53). Prevalence peaked only a few years later, after which a rapid decrease occurred (CAN, 2003). Later analysis shows that most of those who experimented with drugs in a more serious way, almost exclusively cannabis, only did so for a short period of time, after which they returned to a 'normal' life without drugs (Solarz, 1990). Those making up the group of problem drug users in Sweden were recruited through completely different channels, where the common denominator was the marginal position which preceded their drug use (Bejerot, 1965, 1969; Olsson, 1994).

The Swedish hippie era, if it is possible to talk about such an era at all, and the radical youth movement around 1968 were important to conceptions of the drug problem. However, they added little in terms of originating or redefining 'the drug problem'. The hippie era simply allowed media and other actors to revitalise the public discourse on youth and drugs that had already started some 10 years earlier but which, as with most discourses, had stagnated. In particular, two dominant aspects of the discourse in the mid-1950s were revived around 1968: firstly, the idea of youth oppositionism or rebellion, which was attributed to both the youth movements of the mid-1950s and those of the end of the 1960s; secondly, the idea of danger, in terms of the grave risks that were associated with drug use, with no exception made for cannabis. Since cannabis prevalence in the hippie era surpassed by far that in the 1950s, the effect was to 'upscale' the problem with little change to its key qualitative features. Again, we see portrayals of drug addicts as persons without will power who have become slaves to a lethal vice compelled to act as chemically driven 'crime machines' (Winsløw, 1984). Again, we see the factual domestic situation where amphetamine use rapidly spread to become an integral part of an established criminal sub-culture.

In short, the main effect of the 'drug wave' towards the end of the 60s in Sweden was to revive dormant anxieties of an impending social catastrophe and at the same time provide fertile soil for a drug policy with strong moral, legal and social dimensions.

Bibliography

- Bejerot, N. (1965), 'Aktuell toxikomaniproblematik', *Läkartidningen* 50(62): 4231–4238.
- Bejerot, N. (1969), *Narkotikafrågan och samhället*, Aldus, Stockholm.
- Bergmark, A., Björling, B., Grönbladh, L., Olsson, B., Oscarsson, L., Segraeus, V. (1989), *Klienter i institutionell narkomanvård*, Pedagogiska institutionen, Uppsala universitet, Uppsala.
- CAN (2003), *Drogutvecklingen i Sverige. Rapport 2003*, Centralförbundet för alkohol- och narkotikaupplysning, Stockholm.
- EMCDDA (2004), *Annual report 2004*, European Monitoring Centre for Drugs and Drug Addiction, Lisbon.
- EMCDDA (2006), *Annual report 2006*, European Monitoring Centre for Drugs and Drug Addiction, Lisbon.
- Goldberg, L. (1944), 'Vänjning och missbruk efter användning av fenoprominpreparat', *Läkartidningen* 9: 561–577.
- Goldberg, L. (1968), 'Drug abuse in Sweden', *Bulletin on Narcotics* 1: 1–31.
- Grotenhermen, F. (2002), 'The medical use of cannabis in Germany', *Journal of Drug Issues*, Spring: 607–634.
- Lenke, L., Olsson, B. (2002), Swedish drug policy in the twenty-first century. A policy model going astray. *The Annals of the American Academy of Political and Social Science*, July: 64–79.
- Mack, A., Joy, J. (2000), *Marijuana as medicine?: The science beyond the controversy*, National Academy Press, Washington.
- Medicinalstyrelsen (1956), 'I Sverige år 1954 på sjukhus behandlade fall av narkomani', *Läkartidningen* 9: 361–362.
- Olsson, B. (1994), *Narkotikaproblemets bakgrund (The background of the drug problem)*, CAN, Stockholm.
- Rimmerfors, E. (1954), 'Enkel fråga', *Andra kammaren* 15: 19.
- Rimmerfors, E. (1958), 'Interpellation', *Andra kammaren* 4: 67.
- Russo, E. (1998), 'Cannabis for migraine treatment: the once and future prescription? And historical and scientific review', *Pain* 76: 3–8.
- Socialstyrelsen (1973), *Behandling av narkotikamissbrukare*, Allmänna Förlaget, Stockholm.
- Solarz, A. (1990), *Vem blir drogmisbrukare? Droger, kriminalitet och kontroll*, Brottsförebyggande rådet, Stockholm.
- SOU (1967), 25 *Narkotikaproblemet – kartläggning och vård*, Narkomanvårdskommittén, Häggströms, Stockholm.
- SOU (1967), 41 *Narkotikaproblemet – kontrollsystemet*, Narkomanvårdskommittén, Häggströms, Stockholm.
- SOU (1969), 52 *Narkotikaproblemet – samordnade åtgärder*, Narkomanvårdskommittén, Esselte, Stockholm.
- SOU (1969), 53 *Narkotikaproblemet – undersökningar*, Narkomanvårdskommittén, Esselte, Stockholm.
- Tham, H. (1995), 'Drug control as a national project: the case of Sweden', *The Journal of Drug Issues* 25 (1): 113–128.
- Tilander, K. (1991), *Bakom vår blindhet. Röster från Hassela*, Carlsson Bokförlag, Stockholm.
- UNODC (2007), *2007 World Drug Report*, United Nations Office on Drugs and Crime, Vienna.
- Winsløw, J. (1984), *Narreskibet*, Holte, SOCPOL.

Chapter 6

Enlargement 2005: cannabis in the new EU Member States

Keywords affordability – availability – cannabis use – EU enlargement – herbal cultivation – law enforcement – public debate – social representations – social responses – supply routes

Setting the context

This chapter examines cannabis use in the 10 Member States which joined the European Union in May 2004. It attempts to identify patterns in a cluster, and aims to increase our understanding of cultural, social and economic issues which are deeply embedded in cannabis use patterns and social responses.

More time will be needed to grasp the full impact of how drug use is affected by such a root-and-branch political shift as EU membership — if indeed any generalisations can be made in what remain, even after EU membership, very diverse countries. Will cannabis use patterns in EU Member States converge or continue to differ? To what extent does changing affordability, or the geographical proximity to supply routes, affect cannabis consumption? Will new EU members also experience the shift to herbal cannabis cultivation, as witnessed in a number of EU countries? Can country peculiarities, such as the high prevalence of cannabis in the Czech Republic, be easily explained? After EU membership, how does drug use interact with other social, economic and health indicators?

This chapter offers some thoughts, impressions and observations on early experiences. These experiences invite further validation and consideration as the drugs data for these countries mature. Moreover, since this article was written the European Union has further grown: two new Member States, Bulgaria and Romania, joined in January 2007. Drug use in two candidate countries, Turkey and Croatia, has also begun to be monitored directly by the EMCDDA. As the Centre is increasingly sought to comment on drug use among its new members and near-neighbours, this chapter emphasises the value of expert local insights: the voices behind the statistics.

Further reading

European Union enlargement

European Commission enlargement website

<http://ec.europa.eu/enlargement>

EMCDDA (2006), *Country situation summaries*, European Monitoring Centre for Drugs and Drug Addiction, Lisbon

<http://profiles.emcdda.europa.eu>

EMCDDA (2006), *Reitox national reports*, European Monitoring Centre for Drugs and Drug Addiction, Lisbon

www.emcdda.europa.eu/index.cfm?nodeid=435

McKee, M., MacLehose, L., Nolte, E. (eds.) (2004), *Health policy and European Union enlargement*, European WHO Observatory on Health Systems and Policies Series, Open University Press, Maidenhead.

Scott, J. W. (ed.) (2006), *EU enlargement, region building and shifting borders of inclusion and exclusion*, Ashgate, Aldershot.

Stephanou, C. A. (2006), *Adjusting to EU enlargement: recurring issues in a new setting*, Edward Elgar, Cheltenham.

Drugs and the new Member States

Central and Eastern European Harm Reduction Network (CEEHRN) website

www.ceehrn.org

EMCDDA (2005), *Illicit drug use in the EU: legislative approaches* (11 February), European Monitoring Centre for Drugs and Drug Addiction, Lisbon

<http://eldd.emcdda.europa.eu/?nodeid=5175>

Websites of Reitox national focal points

www.emcdda.europa.eu/index.cfm?nodeid=403

Enlargement 2005: cannabis in the new EU Member States

Jacek Moskalewicz, Airi-Alina Allaste, Zsolt Demetrovics, Danica Klempova and Janusz Sierostawski, with Ladislav Csemy, Vito Flaker, Neoklis Georgiades, Anna Girard, Vera Grebenc, Ernestas Jasaitis, Ines Kvaternik Jenko, Richard Muscat, Marcis Trapencieris, Sharon Vella and Alenka Žagar

Introduction

The 2004 enlargement of the European Union (EU) covered 10 countries of very different size, population and culture, spreading from the Baltic to the Mediterranean. Considering existing commonalities and differences, three broad groups may be distinguished: the Baltic States (Estonia, Latvia and Lithuania); the Central European countries (Czech Republic, Hungary, Poland, Slovenia and Slovakia) and the Mediterranean islands (Cyprus and Malta). The number of their inhabitants ranges from just over 400 000 in Malta to over 38 million in Poland. Altogether, close to 80 million people live in the new members of the EU, sometimes referred to as the EU-10.

Significant differences exist in economic development and wealth among the EU-10. Gross national product (GNP) per capita adjusted for purchasing power varies from well below EUR 8 000 in the Baltic states to over EUR 15 000 in Cyprus, Malta and Slovenia. The new EU Member States are also very different in terms of political history. For about a half of the last century the Baltic states were part of the Soviet Union, and Poland, the Czech Republic and Slovakia, as well as Hungary, belonged to the bloc of socialist countries bound militarily and economically to the Soviet Union. Slovenia was part of socialist Yugoslavia, while Cyprus and Malta experienced market economies and more pluralistic political systems after rejecting the colonial power of the United Kingdom about 50 years ago. Eight out of 10 new EU members have been affected, then, by root-and-branch social change in the last 20 years.

Introduction of multi-party political systems and reinforcement of the market economy have resulted in more personal freedom and economic growth in recent years. On the other hand, a sense of everyday security has deteriorated. According to the participants of the project, security deteriorated the most, followed by housing security. Cannabis has been an illicit drug of choice for relatively large segments of young people in Western Europe. After the fall of the Iron Curtain cannabis use has rapidly increased in prevalence in Central and Eastern Europe as well, both in terms of physical presence and as a symbol of affiliation to the Western youth cultures.

This chapter is co-authored by individuals from 10 countries. In the first stage of its preparation, representatives of each country produced a detailed inventory of available cannabis data in standardised format. The inventories served as background material that was used extensively during a two-day workshop with the aim to write a first draft of the chapter. The participants, divided into three groups which focused respectively on epidemiology, social perception and social responses, outlined three sections of the chapter which were then elaborated by three individuals: Airi-Alina Allaste (social perception), Zsolt Demetrovics (social response) and Danica Klempova (epidemiology). Finally, the chapter was combined and edited by Jacek Moskalewicz and Janusz Sierosławski. Support and encouragement was offered by Linda Montanari and Sharon Rödner Sznitman.

Epidemiology

History of cannabis in the region

Origins and industrial use of cannabis in the new EU Member States

Cannabis sativa was thought to be brought to Southern Europe by Scythians in the 7th century BC. After that it gradually spread to other parts of Europe (Booth, 2004; *Encyklopédia Slovenska*, 1979). During feudalism, it was grown in central Europe, including the present territories of the Czech Republic, Hungary, Poland, Slovenia, Slovakia and possibly also other new EU Member States (e.g. Cyprus), usually in small-scale production by farmers, who processed it to make fabric, ropes and oils. The appearance of cheaper materials led to the replacement of hemp and decline of its cultivation. After the year 1945 the small-scale production of hemp almost disappeared. The industrial cultivation of hemp was, however, still present in some countries in the 1980s. Main products made from it included fabrics for clothes, ropes, sheets, bags, cords for tyres, upholstering materials, oil used to make lacquers and varnishes, soap, materials for the food industry, animal foods, medications, materials for the construction industry, cellulose, etc. The contents of THC in the hemp grown for industrial purposes was low — about 1%. At the end of the 1980s, growing and cultivation of cannabis was entirely stopped or heavily reduced due to stricter controls imposed by international conventions.

History of use of cannabis for its psychoactive properties

In Cyprus, cannabis as a psychoactive substance had culturally determined roots: both from Turkish culture present on the island, where cannabis resin used to be smoked in water pipes, and via Cyprus's central location in historical Eastern Mediterranean cannabis trading routes (Egypt, Greece, Lebanon, Syria, Turkey). In Slovenia, the use of

cannabis for its psychoactive and hallucinogenic attributes is also believed to have been known to its inhabitants for centuries.

In Malta documented evidence of cannabis dates back to the early 1980s. During this time herbal cannabis was grown locally, mainly during the summer months. Between 1985 and 1990 an increase in trade between other countries resulted in an increase in the importation of cannabis oil, which is quite rare today, and Lebanese and Moroccan cannabis resin. The latter remains the most common type of imported resin in Malta.

In the Czech Republic, Hungary, Poland, Slovakia and Slovenia anecdotal evidence exists about cannabis use during the revolt of the ‘hippie generation’ from the late 1960s on, although prevalence was rather low. This can partly be explained due to low THC content in domestic cannabis and low availability and relatively high prices of cannabis sourced abroad. In Slovenia, with its warmer climate, cannabis use was supported from home growing during the 1980s. In that period, often referred to by the users as a golden age, cannabis supply was based on principles of reciprocity, barter and gifts, and not based on a criminal black market (Flaker, 2002).

In Estonia, Latvia and Lithuania, cannabis for psychoactive purposes is anecdotally reported to have been brought by soldiers serving their compulsory military service in Central Asian republics in the 1970s and 1980s. Herbal cannabis known as ‘anasha’ was consumed and brought home to some extent, especially by young soldiers (Kärđi, 1993: 54–61, 58–63).

However, the history of the use of cannabis for its psychoactive properties in the 10 new EU Member States is only documented anecdotally, and historical sources in most of the countries are scarce. With the exception of Cyprus, and perhaps Malta and Slovenia, before the 1990s the psychoactive properties of cannabis went either generally unrecognised or its use was very rare.

Contemporary prevalence of cannabis use

European School Project on Alcohol and Drugs

The most consistent data source for country comparison of cannabis use among teenagers is probably the *European School Project on Alcohol and Drugs* (ESPAD, see Hibell, this monograph). This survey took place in all of the 10 new EU Member States in the years 1995, 1999 and 2003 (Hibell et al., 1997, 2000, 2004).

Figure 1 shows trends in lifetime prevalence of cannabis use among 15- to 16-year-olds, according to the ESPAD survey in the 10 new EU Member States, while Figure 2 presents differences between lifetime, last year and last month prevalence, as recorded in 2003 (Hibell et al., 2004).

Figure 1: Lifetime prevalence of cannabis use among 15- to 16-year-olds (ESPAD, 1995, 1999, 2003)

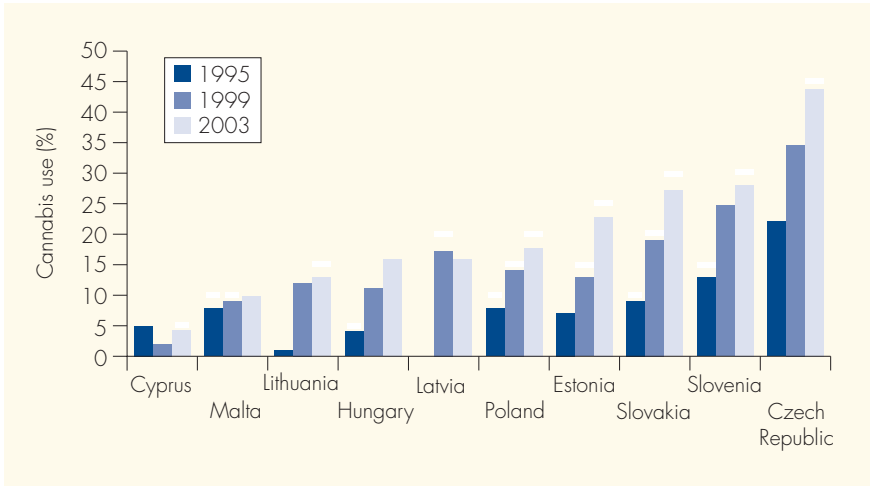
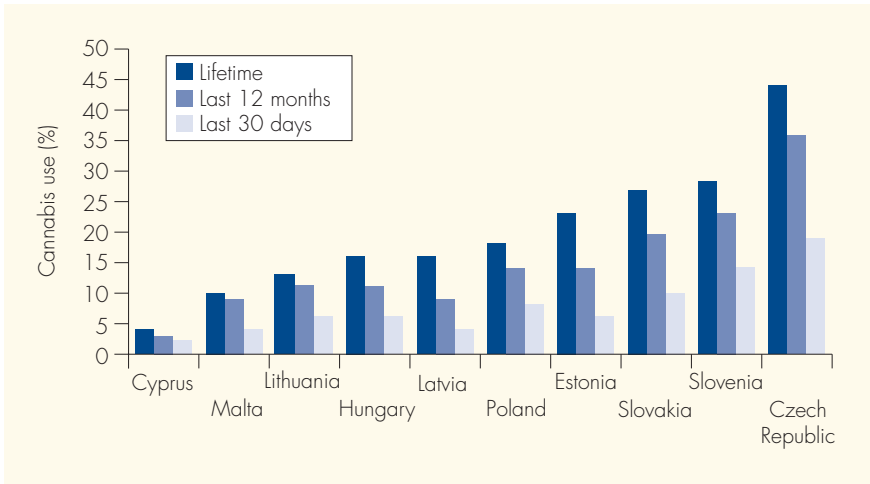


Figure 2: Lifetime, last-year and last-month prevalence of cannabis use among 15- to 16-year-olds (ESPAD, 2003)

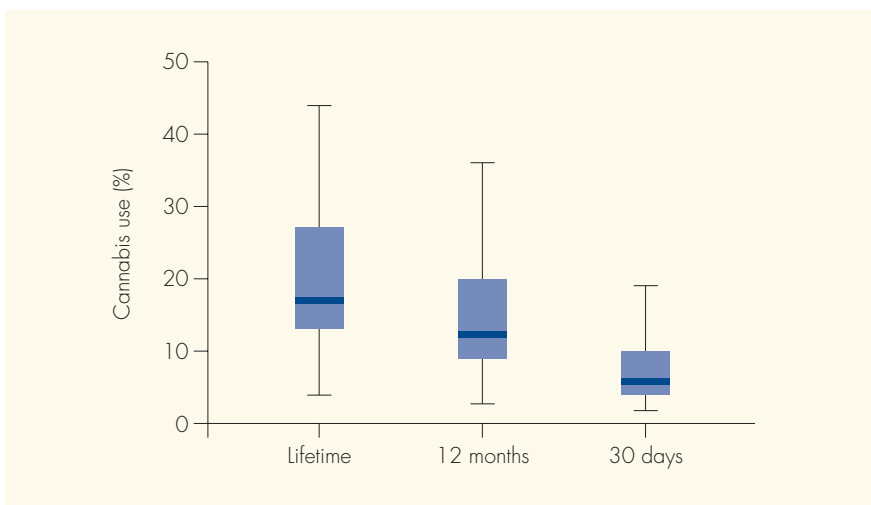


The reported lifetime prevalence of cannabis use among 15- to 16-year-old ESPAD respondents increased in the years 1995–2003 in all new EU member countries except Cyprus, where it remained approximately stable at a relatively low level (2–5%). The increase in the years 1999–2003 was smaller in most countries than in 1995–1999. Among the 10 countries, a medium level of lifetime experience with cannabis can be found in the Baltic countries (Estonia, Latvia and Lithuania) and in Hungary, Malta and

Poland (10–18%). The highest lifetime cannabis use prevalence is reported in the Czech Republic (44%), Slovakia (27%) and Slovenia (28%).

Last year and last month prevalence of cannabis use among 15- and 16-year-olds show similar time trends. Last year prevalence is lower than, yet mostly close to, lifetime prevalence in this age group. Last month prevalence, as an indicator of regular cannabis use, is much lower. In the three countries with the highest prevalence, regular use ranges from 18% in the Czech Republic through 14% in Slovenia to 10% in Slovakia. The range of the remaining seven countries is narrower and it varies from 2% in Cyprus to 8% in Poland. As a rule, prevalence of cannabis use during last month constitutes about 50% of the last year prevalence, while last year prevalence is 15–40% lower than lifetime cannabis experience. In effect, the wide gap among countries with regard to lifetime use tends to narrow with increasing frequency of use (Figure 3).

Figure 3: Inter-country variation in lifetime, last-year and last-month prevalence of cannabis use among 15- to 16-year-olds (ESPAD, 2003)



The three syringes above show inter-country ranges in lifetime, last year and last month prevalence of cannabis use. Each cylinder represents two quartiles of respondents spread either side of the median and, finally, a horizontal pusher indicates a median value of prevalence among all countries. The declining values of all three indicators confirm that the cultural gap in cannabis use tends to close with growing frequency of use.

General population surveys

The general population surveys provide a picture of cannabis use among the young population (15–34), which is slightly different from the ESPAD results (see Figures 4 and 5). In Latvia, general population prevalence is similar to ESPAD survey results. In Lithuania, Slovakia and Hungary, the ESPAD results show similar values for lifetime prevalence, but indicate higher last year and last month prevalence. In the Czech Republic, Estonia, Malta and Poland, cannabis use among 15- to 16-year-olds surveyed by ESPAD is markedly higher than in the general population. Cyprus is the only country where general population data indicate higher prevalence than ESPAD data. There is a sharp contrast between figures for 15- to 16-year-olds — ranging from 1 to 5% — and those for young adults aged 15–34 — ranging from 13 to 25%. Data from Cyprus also show smaller gaps between lifetime experience and last year and last month use.

General population surveys across all 10 countries confirm that cannabis use is not only a matter of teenager behaviour, but is also prevalent among young adults up until their early 30s. Similarly to ESPAD, general population surveys show that while cannabis has been tried by a substantial proportion of young people, regular cannabis use is still only represented by small percentages of young adults.

Figure 4: General population survey results from 2001 or 2002 about the prevalence of cannabis use among the young population (15- to 34-year-olds)

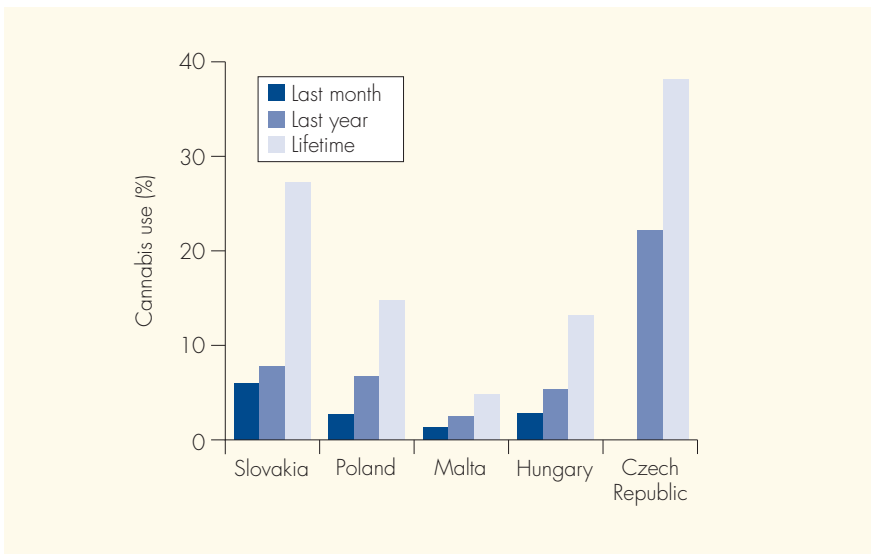
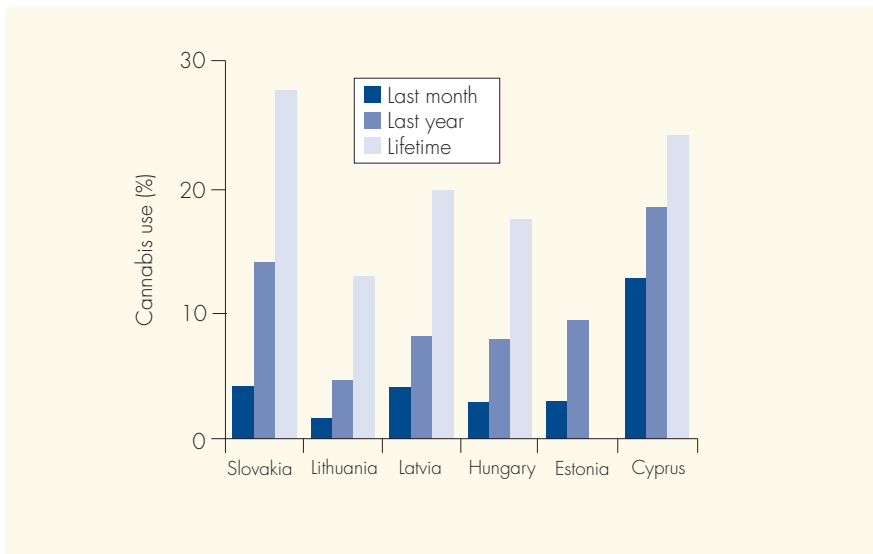


Figure 5: General population survey results from 2003 or 2004 about the prevalence of cannabis use among the young population (15- to 34-year-olds)



Differentiation in cannabis use

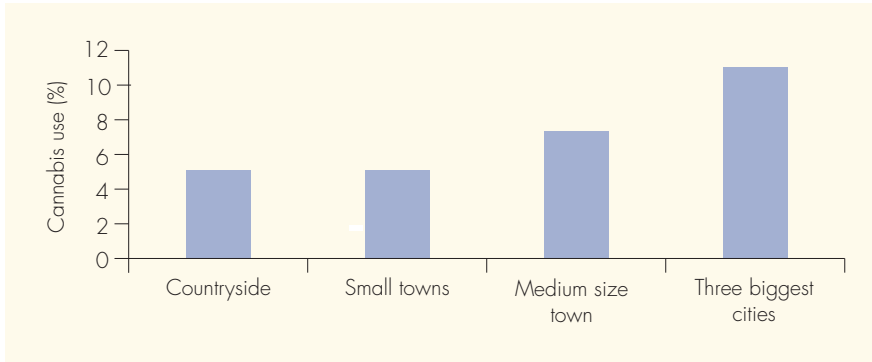
Gender

Although in all countries cannabis use is higher among males than females, the size of the gap between the genders differs. Among 15- to 16-year-olds in 2003 there were five males to one female using cannabis in Cyprus, and two males to one female using cannabis in Latvia, Lithuania and Poland. The ratio ranged between 1:3 and 1:4 in Estonia, Hungary, Malta and Slovakia, and it was very small, at just below parity, in the Czech Republic (1:1) and Slovenia (1:1) (Hibell et al., 2004). It is worthwhile noting that a trend towards a more narrow gender gap was reported in most of the countries between 1995 and 2003.

Urban versus rural areas

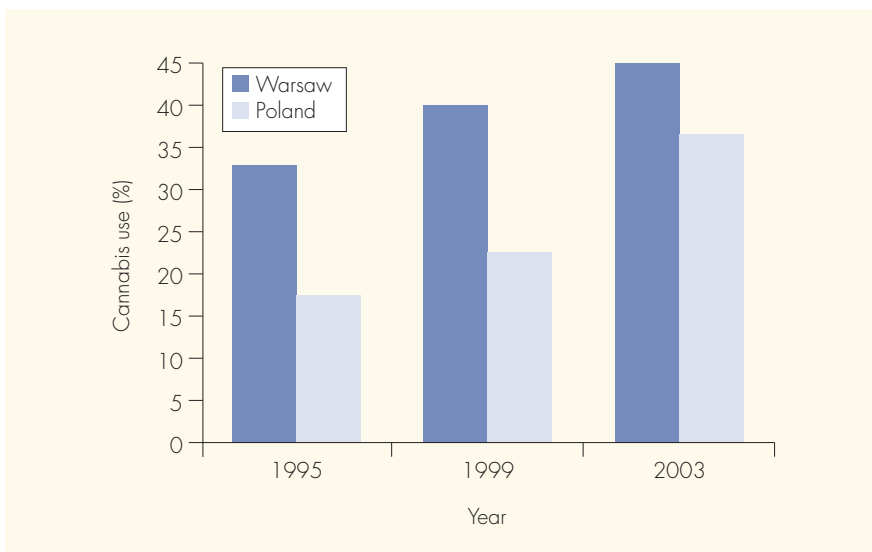
All of the countries which explored the difference between rural and urban areas found a higher prevalence of cannabis use in the larger cities, for example Estonia, Lithuania, Poland or Slovakia (see Figures 6 and 7). In some countries, this difference between urban and rural areas is levelling off (e.g. in Poland) while in others (e.g. Slovakia) it remains stable.

Figure 6: Lifetime prevalence of cannabis use (%) by level of urbanisation in Lithuania among 15- to 64-year-olds



Source: General population survey 2004.

Figure 7: Lifetime cannabis use (%) among 17- to 18-year-olds in the capital of Poland, Warsaw, compared with national data

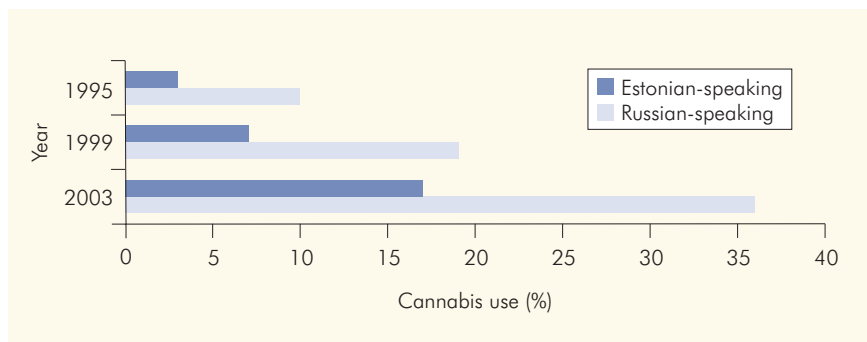


Source: ESPAD.

Other socio-economic factors

Data from the ESPAD survey in most countries revealed a clear association between cannabis use and truancy, sibling substance use and parents not knowing where the student spends Saturday night. A slightly weaker, yet still significant, association in most countries was living in a non-intact family structure. The association is unclear or non-existent in the cases of parents' education and the economic situation of the family in which the respondent lives (Hibell et al., 2004).

Figure 8: The difference in lifetime prevalence of cannabis use according to ESPAD surveys 1995, 1999 and 2003 by working language at school in Estonia



In Estonia, analysis of the available data also revealed higher cannabis use among the Russian-speaking part of the population. This discrepancy, which has slowly tended to narrow, can be attributed to a number of factors. First of all, Russian-speaking schools are mostly located in the cities where drug use is more widespread. Secondly, the Russian-speaking population lives in the north-western part of Estonia, which suffers from a higher level of social exclusion, including high unemployment and criminality, as well as alcohol and drug use (Allaste and Lagerspetz, 2005: 267–285) (Figure 8).

Patterns of cannabis use

Description of the patterns of use

In all new EU Member States, cannabis is found in all forms with various levels of THC concentrations: herbal cannabis and cannabis resin, both imported as well as grown indoors or outdoors. The general pattern of smoking cannabis herb or cannabis resin dominates, with herb dominating in some countries and resin in others. In those countries where the traditional consumption mode was the water pipe, this is fading and hardly exists among youngsters.

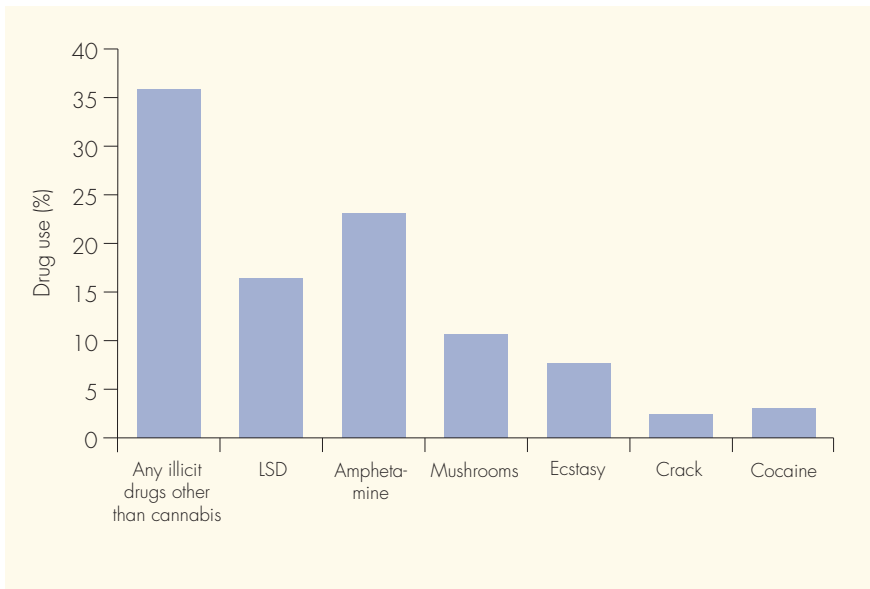
In most countries cannabis use has become more or less normalised among youths. This does not mean that all young people use cannabis, but that the drug is fairly available and the majority of youths are 'drug-wise' and tolerate cannabis use among others, even if they themselves do not use the substance (Parker et al., 1998). According to qualitative data, cannabis use does not increase the social status of the user, nor does it benefit from aggressive marketing. Cannabis has emerged simply as a part of the culture of young people, who want to have fun with their friends (Fatygina and Sierosławski, 1999).

Polydrug use

Users of cannabis usually have a higher probability to have experienced other drugs, in particular stimulants and hallucinogens (e.g. Zimmerman et al., 2005; Milani et al., 2005; Butler and Montgomery, 2004). This relationship also appears to hold true for the new EU Member States. According to secondary analysis of ESPAD data, last year prevalence of marijuana use in new EU members highly correlated ($P < 0.05$) with the prevalence of the use of ecstasy and any illicit drug other than marijuana and hashish ($P = 0.722$ and 0.691 respectively).

According to Slovenian qualitative research (Kvaternik, 2004), young people in the age group 15–25 (pupils and students) usually engage in more risky behaviour than their older peers while using drugs. They consume more drugs (polydrug use) and larger quantities in any one occasion. Although being reasonably informed, it seems that in practice they do not seriously consider potential health risks.

Figure 9: Last-year prevalence of other drugs use among last year cannabis users (Poland 2002, general population, aged 16- to 34-years old)



Users of ‘harder’ drugs are more likely to have used cannabis too. Practically all ecstasy users use cannabis to recover from a night of exposure to ecstasy and noise (Demetrovics, 2001; Moskalewicz et al., 2004). On the other hand, the majority of cannabis consumers do not use other drugs, as documented by the Polish survey data. As can be seen from the graph, under one-third of cannabis users combine cannabis with other drugs, mostly with stimulants and hallucinogens, while 65% of them use only cannabis. It must be stressed that the vast majority of cannabis users never use opiates (Figure 9).

The role of social networks

According to ESPAD, in all of the 10 countries except Lithuania, the illicit drug first used, usually cannabis, is typically obtained from a friend, or shared in a group (ESPAD, 2003). Polish qualitative research has revealed that the pressure to use cannabis when peers are using is not perceived to be strong by young people. They argue that they are free not to use when they choose not to (Fatyga and Sierostawski, 1999).

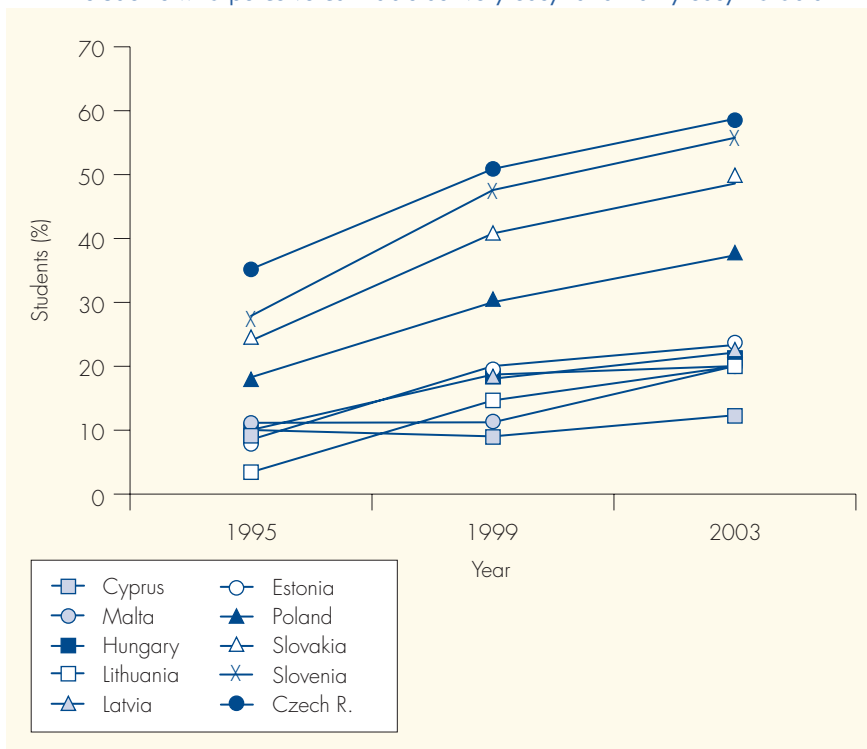
Availability of the drug

Subjective availability

Availability of cannabis can be indirectly inferred from the data on perceived availability, police seizures data and also prices of the drug on the street as they indicate economic accessibility of drugs if related to incomes.

A few conclusions can be drawn from Figure 10. First, cannabis seems to be fairly easily available for a substantial proportion of students in all countries under review — from

Figure 10: Perceived availability of cannabis among 15- to 16-year-olds: percentage of students who perceive cannabis as 'very easy' and 'fairly easy' to obtain



Source: ESPAD 1995, 1999, 2003.

more than 10% in Cyprus to close to 60% in the Czech Republic. Second, perceived cannabis availability has increased in all countries, and no saturation effect has been recorded. In other words, countries that reported high availability already 10 years ago tend to see it growing as fast as remaining countries. Third, it is evident that large differences still exist among the new EU members. Four groups of countries emerge, the first being high availability countries, including the Czech Republic, Slovenia and Slovakia, where subjective availability is around 50% and over. These countries are followed by Poland, where the indicator approaches 40%. Then, remaining countries report availability of approximately 20%. Finally, Cyprus reports the lowest availability, where only 12% of students consider cannabis easily available.

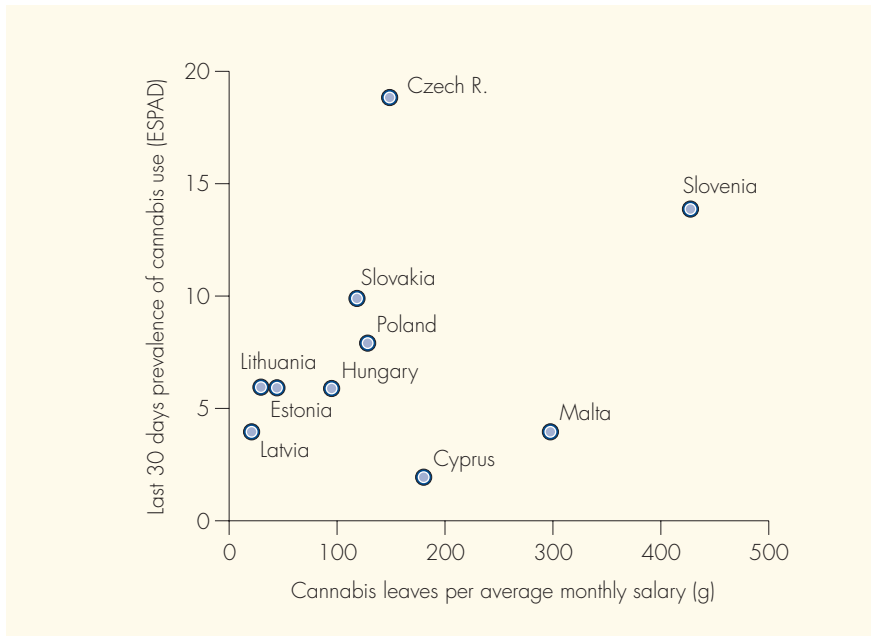
Economic accessibility

For decades, centrally planned economies in Eastern Europe were economically relatively self-contained. The economic systems included the non-convertibility of their currencies. In effect salaries, although adequate in terms of purchasing power, were extremely low when exchanged to any convertible currency, varying between USD 20 and USD 50 per month. On the one hand, smuggled cannabis was practically unaffordable for young people, and, on the other hand, Central and Eastern European markets were of little interest for illicit suppliers. The transition to a market economy brought with it the convertibility of national currencies and a rapid increase of nominal incomes calculated in hard currencies. More than a decade after this transition, prices per gram of cannabis in the EU-10 have become relatively stable and are close to prices in the EU-15, ranging from EUR 3.5 in Slovenia to EUR 17 in Latvia.

There are substantial variations in prices in relation to purchasing power, too. The average monthly income in the Baltic States equates to the value of 30–50 g of cannabis, in the Central European countries to 100–150 g. In Cyprus, Malta and Slovenia, where the currencies have been convertible for decades, an average monthly income could buy 200–400 g of marijuana.

Figure 11 shows that herbal cannabis prevalence increases with average purchasing power. This is particularly the case for former socialist countries, where national currencies became suddenly convertible at the beginning of the 1990s, and where purchasing power for imported goods increased manifold almost overnight. The outliers of this linear relationship are countries with very high (Czech Republic) or very low (Cyprus and Malta) cannabis use. Cyprus and Malta represent relatively affluent societies with a longer history of a market economy, where cannabis has been relatively affordable for decades. The third outlier — the Czech Republic — has the highest prevalence of cannabis use worldwide. Its high position on the plot may partially be attributed to its relative wealth. However, all three outliers confirm that socio-cultural factors in drug consumption are more important than affordability alone.

Figure 11: Herbal cannabis buying power of an average monthly salary



Social representations of cannabis in new EU countries

General perception of the drug problem

Officially, the new EU countries do not make distinctions between cannabis and other drugs, and the general public supports such grouping of illicit drugs. In most countries, the media tends to sensationalise drug use (Paksi, 2000: 70–86). This means that overdose cases, seizures and other drug-related crimes are overexposed compared with other major social questions. Cannabis, if discussed at all, is primarily mentioned as a gateway drug, and the normative idea that smoking cannabis leads to use of harder drugs is expressed from time to time in most of the countries. As is common in many countries, problem drug users are often stigmatised. A common presentation of drug users that is propagated through the media is the image of drug addicts as dirty asocial human wrecks with frantic eyes. However, according to public opinion surveys from Poland and Estonia, people tend to perceive drug addicts as ill people rather than as criminals (Laidmäe and Allaste, 2004: 118–143).

Perception of cannabis by the younger generation

Whereas the older generations tend to perceive all drugs as equally dangerous, younger generations tend to consider cannabis less harmful than other drugs in all the new EU countries. The generation gaps emerge with rapid social and cultural change and 'the young quickly acquire "new strategies of action" for coping with life in unsettled times' (Misztal, 2003: 85). Illicit drugs were introduced to the Baltic market only during the last decade, and to the Central European markets only a little earlier. This created a situation where the younger generations, who are experimenting with drugs, know more about the topic and are also much more tolerant than the older generations.

According to the ESPAD study, social condemnation of experimenting with cannabis is decreasing in Central Europe, and the most tolerant attitude towards this issue is displayed by school teenagers in the Czech Republic and Poland.

Although cannabis use has become ordinary, especially in the countries of Central Europe, it has also sometimes acquired a symbolic meaning of rebellion, at least in some youth cultures. Nevertheless, this rebellion is not a total negation of the society's value system, as was evident in the 1960s. Today, young people consider cannabis prohibition hypocritical within the context of the growing availability of alcohol. They either question the right of the state to impose the ban or demand that liberal economic policies applied to legal drugs should be extended to cannabis.

Images of cannabis in the arts and the media

Cannabis is not used extensively in the established visual arts, but the portrayal of cannabis with clearly positive connotations can often be seen in graffiti in most of the countries. Cannabis symbols are used in souvenirs, T-shirts, earrings, scarves, bracelets, cough drops, etc., and images of cannabis leaves can sometimes be found in book designs. However, these are niche products that can be bought from alternative shops or markets in most of the countries, and are found more commonly only in the Czech Republic.

Positive connotations of cannabis are much more often expressed in local popular and hip-hop music. In Poland, the vocalist Lora Szafran sings about the society which prohibits cannabis use but encourages youngsters to drink alcohol: 'The society is telling you that you better drink and smoke (tobacco) but grass is peace while alcohol — madness.' In the Czech Republic, the columnist of the magazine *Reflex*, Jiří Doležal, has been a strong voice in cannabis advocacy (1).

(1) Seth Fiegerman, Jiří Doležal: 'Still looking for change', *The Prague Post*, 18 April 2007.

Popular culture stresses the positive features of cannabis in contrast to other drugs: 'Weed unites people', 'Marihuana heals, other drugs — never use them'. Marijuana is strongly associated with rasta culture and hip-hop music, and the respective attitudes are openly expressed in the songs. Hip-hop has become a popular part of youth culture, and those who claim to belong to the sub-culture often call themselves: 'The Society of Hash and Scun', 'League of Blunters' or 'bluntoholics'. All of these play on slang for cannabis. Cannabis use combined with alcohol seems to have become an integral part of their lifestyles, as well as its symbol (Demetrovics, 1998, 2001, 2005; Tossman et al., 2001).

Social response

Supply reduction

Legislation and policy

Drug legislation in all new EU members has evolved for several decades in an unexpected way. Twenty years ago drug legislation was restrictive and repressive in the Baltic States, as elsewhere in the Soviet Union. Restrictive laws prevailed in Cyprus and Malta, too. However, in Czechoslovakia, Hungary, Poland and Yugoslavia the penal sanctions were not that severe and possession of drugs was not penalised at all. In the 1990s when a number of 'old' EU countries tended to liberalise their drug policies, countries of Central Europe introduced more repressive legislation, which generally did not make any distinction between cannabis and other drugs.

Currently, the new EU countries have stricter drug laws compared with the majority of pre-2004 Member States. Nevertheless, in terms of the most repressive legal control (prison sentences for drug use), only Cyprus among the 10 new EU Member States imposes prison sentences for drug use, vis-à-vis four existing Member States (Greece, France, Finland and Sweden). In addition to Cyprus, the Baltic countries deem drug use to be an administrative offence.

Possession of small amounts of drugs for personal use is criminalised in all of the new EU Member States, although differences exist between legislative penalties and actual sentencing practice at the judicial level. Nevertheless, in the Czech Republic, in the case of small quantities for personal use, and in the absence of aggravating circumstances, the law foresees 'administrative' sanctions only (EMCDDA, 2005). In the Baltic States (Estonia, Latvia and Lithuania), possession of a small amount of any drug is considered a 'non-criminal offence'. The difference with regard to the Czech Republic is that in Estonia, Latvia and Lithuania a 'non-criminal offence' may be punished by *deprivation of liberty* for up to 30, 15 and 45 days respectively. In Slovenia, possession for personal

Table 1: The most important characteristics of the national drug laws in the 2004 round of new EU Member States

Country	Punishment for cannabis use	Differentiation between small and substantial quantity of cannabis (threshold)	Maximum penalties for possession for personal use (small quantity)	Maximum penalties for possession for personal use (other than small quantities)	Maximum penalties for trafficking	Possibility of diversion
Czech Republic	No	Yes (10 joints, or 10 doses of 30mg THC)	Fine (up to EUR 500)	Up to 2 years; fine	1–5 years	Yes; treatment with probation possible
Estonia	Yes, the use is deemed an administrative offence	Yes (50g marijuana, 10g hashish or 5g liquid hashish)	Fine (up to EUR 770) or arrest (up to 30 days)	Not regulated separately	For trafficking up to 10 years (aggravating circumstances: up to 20 years)	Yes
Cyprus	Yes, the use of drugs is deemed a criminal offence	Yes (30g or three plants)	Up to 8 years (1 year if the person is younger than 25)	Up to life	Up to life	Yes
Latvia	Yes, the use is deemed an administrative offence	Yes	Fine (up to EUR 130) or 15 days' arrest	Up to 5 years	Up to 10 years for trafficking but 8–15 years if a substantial quantity	No data
Lithuania	Yes, possession/use is deemed an administrative or criminal offence depending on quantity	Yes (less than 5g marijuana or 0.25g hashish is a small quantity)	Fine (up to EUR 290) or 30 days' arrest	Up to 2 years or, if a substantial quantity, 2–15 years	2–8 years (small or average quantity), 8–15 years if a substantial quantity	No data

Hungary	No	Yes (1 g THC is considered a small quantity)	Up to 2 years (in practice no imprisonment for personal use of small quantity)	Up to 5 years; or, if a substantial quantity, 5–10 years	2–8 years (more than a small quantity); 5–15 years (substantial quantity)	6 months' pre-trial diversion (treatment or counselling) in case of small quantities for personal use
Malta	No	Yes (difference between simple possession and possession with intent to supply, which carries a trafficking charge)	3–12 months' imprisonment	Not applicable	Up to life sentence	Alternatives to imprisonment can be applied for first-time offenders
Poland	No	Not precisely defined, but the differentiation exists	Up to 1 year	Up to 3 years	Up to 8 years, or up to 10 years if a substantial quantity	Yes
Slovenia	No	Not defined	Fine (between EUR 42 and 208) or up to 5 days' arrest (in practice no imprisonment for cannabis)	Fine (between EUR 208 and 625) or 30 days' arrest	1–10 years	In cases of possessing small quantity of illicit drugs for personal use, more lenient punishment is possible if the person voluntarily enters into treatment or social security programmes
Slovakia	No	Not precisely defined (in terms of dose for personal use)	Up to 3 years of prison	Up to 5 years of prison	Up to life	No

Sources: EMCDDA (2005) and personal communication with the country representatives.

use is punished by a monetary fine or 5–30 days of arrest. In the remaining new EU Member States any kind of possession for personal use is considered a criminal offence, making sentences involving imprisonment possible (EMCDDA, 2005). However, possibilities to avoid imprisonment are available in some countries through *diversion* or *referrals* (entering treatment as an alternative of the legal process or imprisonment or suspension of a prison sentence). In other countries the application of the law seems to be more lenient than would be possible if the text of the law were taken literally. In Hungary, for example, two years of imprisonment is envisaged for possession of a small amount of cannabis for personal use only, but until the time of writing no-one has been sentenced to such a term of imprisonment. Differentiation between possession for personal use and trafficking exists in all 10 countries, while a differentiation between small and substantial quantities is defined in a number of ways. In some countries there is no exact definition, but the differentiation is based on whether the cannabis was for personal use or for dealing (Table 1).

Law enforcement

Among the new members, two groups of countries can be distinguished in terms of law enforcement (that is, the extent to which police and other law enforcement agencies implement a law). In the first group — Malta and Slovakia — any drug-related crime is subject to a high level of police activity, which means that the level of law enforcement is the same in the case of personal use as in the case of trafficking. In all other countries — with the exception of Estonia, for which data were not available — a more

Table 2: Absolute number of seizures (all drugs and cannabis alone) and number of seizures per 100 000 inhabitants in 2004

Country	Number of drug seizures (all)	Number of cannabis seizures	Number of drug seizures (all) per 100 000 inhabitants	Number of cannabis seizures per 100 000 inhabitants
Czech Republic	907	572	8.9	5.6
Estonia ⁽¹⁾	940	270	69.6	20.0
Cyprus	n/a	n/a	n/a	n/a
Latvia	n/a	316	n/a	13.6
Lithuania	1 552	265	45.0	7.7
Hungary	2 751	1 791	27.2	17.7
Malta	308	113	77.0	28.3
Poland ⁽¹⁾	543	305	1.4	0.8
Slovenia ⁽²⁾	4 777	3 421	243.2	174.2
Slovakia	1 538	913	28.6	17.0

⁽¹⁾ Data from 2002.

⁽²⁾ Data from 2003.

differentiated picture can be identified. In these countries use and possession of a small quantity of cannabis for personal use is enforced at a low or medium level, while the focus of the police and other agencies is on trafficking or possession of substantial quantities of drugs.

Other, more objective data show that the most seizures (both cannabis and other drugs) occurred in Slovenia (4 777 seizures for any drugs in 2003; 3 801 in 2004) followed by Hungary (2 952 in 2003; 2 751 in 2004), Slovakia (1 532 in 2003; 1 538 in 2004), Lithuania (1 029 in 2003; 1 552 in 2004), Estonia (1 060 in 2003) and the Czech Republic (979 in 2003; 907 in 2004). When drug seizures are calculated per 100 000 inhabitants, the highest rate of seizures is found in the smallest countries — Estonia, Malta and Slovenia — while the lowest is found in the Czech Republic and Poland. Only Hungary diverges from this rule, particularly with regard to cannabis, which has three times more seizures than the Czech Republic, yet a comparable number of inhabitants (Table 2).

However, there are large differences in what percentage of these numbers are cannabis seizures. For example, in Slovenia in the past four years, 70–90% of all seizures were of cannabis. In the Czech Republic, Hungary, Poland and Slovakia this proportion varied between 40 and 70%. Lower shares of cannabis seizures can be found in Lithuania (12–17%), Estonia (26–29%) and Malta (33–43%). Figure 12 suggests that

Figure 12: Proportion of cannabis seizures among all drug seizures

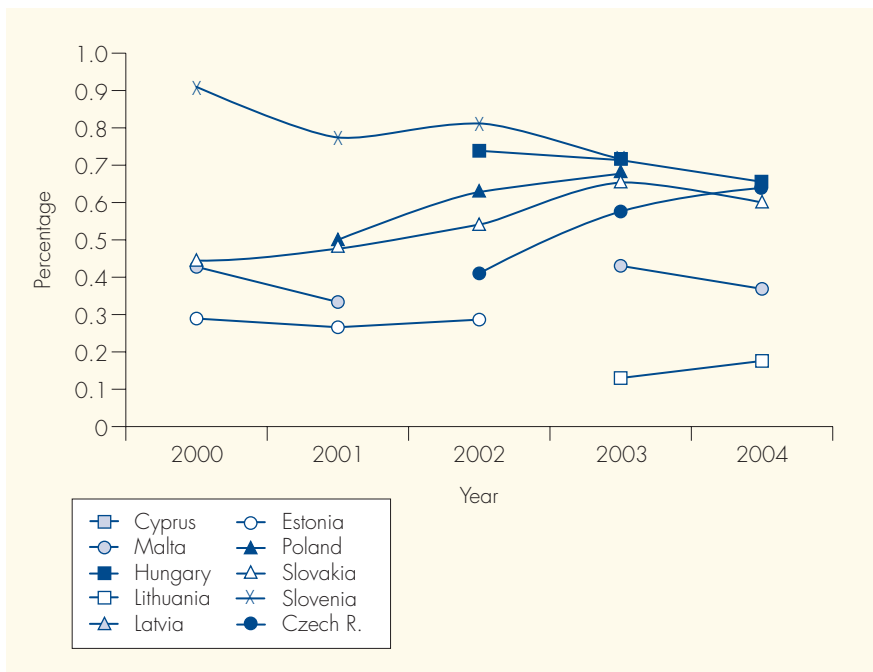
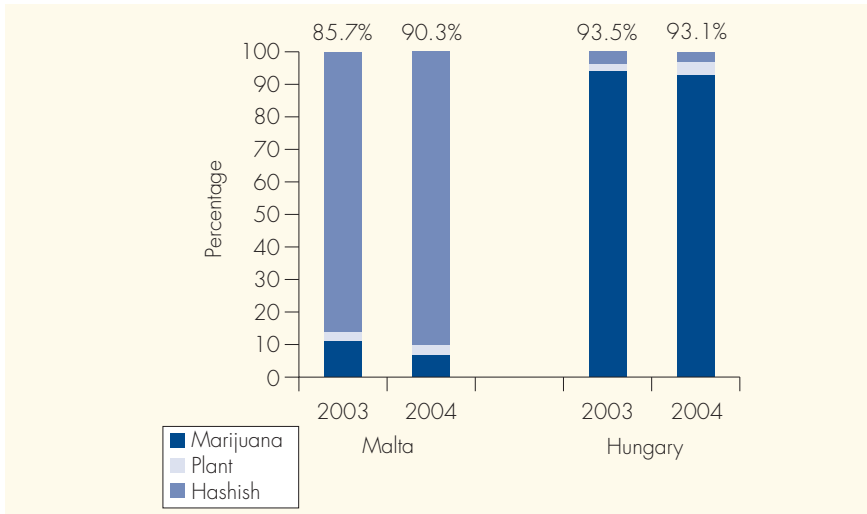


Figure 13: Herbal cannabis to cannabis resin ratio in cannabis seizures in Malta and Hungary

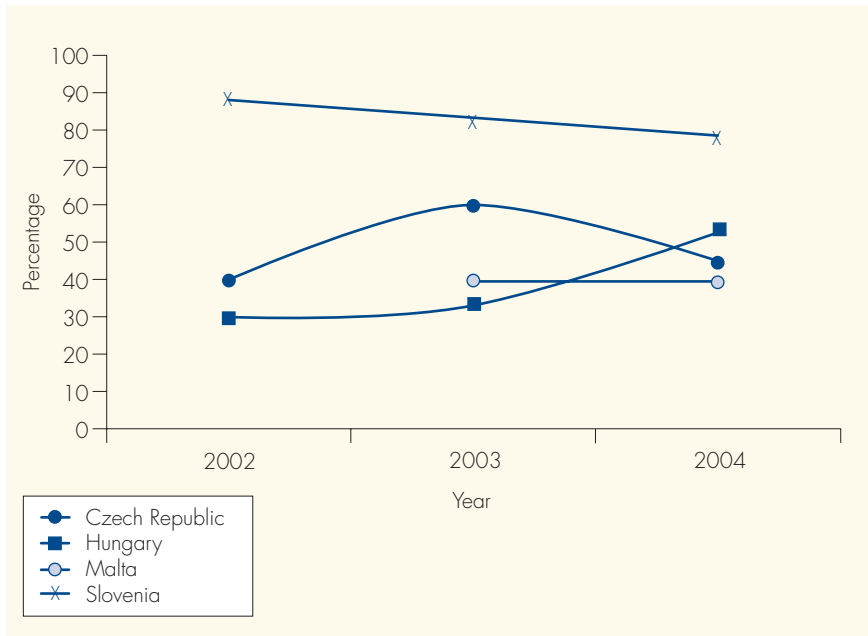


the proportion of law enforcement efforts devoted to cannabis is converging in the 10 countries. In those with the highest ‘cannabis oversight’ (Hungary and Slovenia), the cannabis share in their seizures has declined while in the remaining countries this share has tended to rise (Figure 12).

Data are available only from Hungary and Malta about the type of cannabis seizures, but these two countries are worth comparing as they represent substantially different profiles. In Malta the highest percentage of cannabis seizures is registered for cannabis resin (70% to well over 90%), while in Hungary herbal cannabis represents 93% of all cannabis seizures. This comparison may reflect either a great distinction in consumption patterns or a large difference in the focus of control (Figure 13).

A substantial proportion of those who are arrested for petty drug offences — drug possession or use but not trafficking — is arrested because of cannabis. The highest percentage can be found in Slovenia, where four out of five arrests are related to cannabis. In the three other countries where data are available, this share varies from 30% to 60%.

Figure 14: Proportion of cannabis arrests among all arrests for possession and/or personal use



Demand reduction

Prevention

Prevention campaigns in all 10 countries are dominated by school-based universal prevention programmes, and these naturally integrate cannabis-related issues. However, programmes do not specifically discuss this drug, and no specific emphasis is placed upon cannabis (Paksi and Demetrovics, 2002).

Treatment response

Among the 10 countries, Hungary has the highest prevalence of cannabis users in treatment (see Figures 15 and 16), estimated at 45 cannabis clients in treatment per 100 000 inhabitants (2004). Hungary is followed by Malta (32 per 100 000 in 2003), Estonia (15 per 100 000 in 2003) and the Czech Republic (14 per 100 000 in 2004). In all remaining countries there are 10 or fewer cannabis clients per 100 000. As is also evident in the pre-2004 EU Member States (see Montanari et al., this monograph), all of the new EU states have experienced a substantial increase in cannabis admissions to treatment in the past 10 years. This increase is, however, proportionately higher in Hungary than in the other countries. The reason behind this may be attributed to the

Figure 15: Patients demanding treatment for cannabis as a primary drug (all data sources)

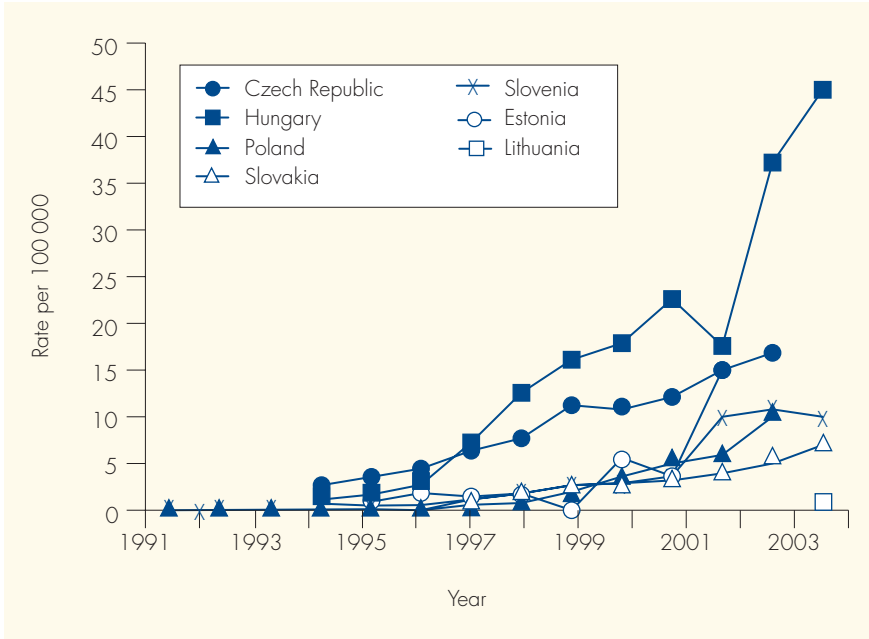
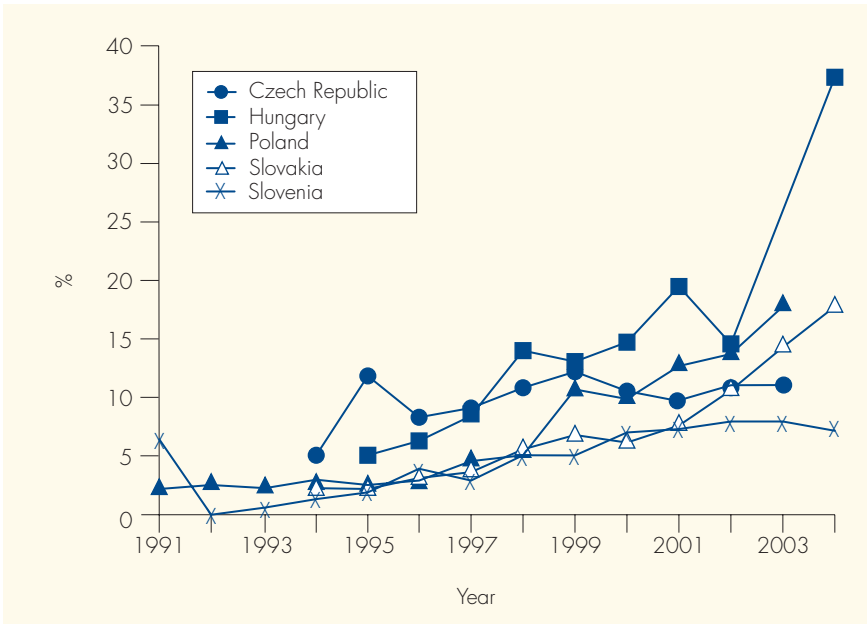


Figure 16: Proportion of clients with cannabis as their primary drug among all treatment clients



proportionately high possibility of referrals (choosing treatment as an alternative to the legal process) rather than a greater need for treatment in Hungary. In 2004, for example, more than half of the clients entered treatment in the frame of referrals, and not on the basis of experiencing physical or mental problems which requires professional help.

Slovakia: outpatient treatment services

In relation to the graphs above, it must, however, be noted that the increase in demand for treatment is a complicated issue and not fully explained in the literature. Trends which indicate an increase in cannabis admissions may reflect: growing numbers of problem cannabis users who look for help with their medical problems; an increase in specialised services which may attract more clients; and more restrictive legislation and enforcement which forces cannabis users to seek an alternative to prosecution in the less repressive medical sector (see Simon, this monograph).

Public debate

Political debate

Officially, there is no distinction between soft and hard drugs in any of the new Member States. Nevertheless, there are some differences in perception of cannabis at the official level. In the Czech Republic, the National Drug Commission has initiated amendments in the legislation in order to distinguish between soft and hard drugs. In Hungary, the distinction between soft and hard drugs and decriminalisation of cannabis use are supported by the representatives of the Hungarian Liberal Party. In Poland, representatives of left-wing political parties also favour depenalisation of cannabis. In 2004, a member of the parliament from the then governing Democratic Left Alliance officially issued a statement on the legalisation of drugs, especially cannabis, which was widely quoted by the media. Two years ago, the agenda of a local left-wing party in Slovakia included decriminalisation of cannabis. By contrast, in the Baltic States and Malta, no officials have publicly expressed their support for the decriminalisation of cannabis.

The topic of legalisation of cannabis use has received much attention from the public in recent years. Much of this discussion has been driven by the liberalisation of drug policies and decriminalisation of cannabis in parts of Western Europe. In Estonia this Western liberalism is strongly opposed by the authorities. The Minister of Social Affairs stated publicly in a newspaper that use of cannabis is illegal and will remain illegal. In other countries, particularly in Slovenia, a co-author suggests that politicians may be waiting for EU directives or an external initiative in order to deal with this matter.

To summarise, opposing political forces tend to gain political leverage from the drugs question in general, and cannabis in particular. Their motives include generating support either among young voters who defend decriminalisation or legalisation, or among conservative elements of society who demand more repressive policies. This political context is counterproductive to a technical discussion on how to achieve a more rational consensus on cannabis policy.

Cannabis activist groups

In Central and Eastern Europe there are active groups advocating drug law reform in terms of depenalisation or decriminalisation of cannabis. In Hungary, one of the leading professional drug reform organisations is the Hungarian Civil Liberties Union (HCLU), which advocates the human rights of other vulnerable populations as well. The Hemp Seed Association (Kendermag Egyesület), a local users' group, actively speaks in favour of the legalisation of cannabis. Each year the Hemp Seed Association organises a demonstration as part of the Million Marijuana March (an annual, worldwide protest campaign for the legalisation of cannabis) in Budapest. It also initiated a civil disobedience movement in March 2005. Participants of this movement appeared at the National Police Headquarters, blaming themselves for violating drug laws in order to raise awareness of the criminalisation of drug users. In the Czech Republic, there are also rather professional organisations fighting for the rights of cannabis users, and there is also a 'Cannabis Ombudsman' whose mission is to help people who have problems with the law. In Poland, the Kanaba.info Association is a union of Polish drug users and other people alarmed by the present repressive drug policies. In 2003, they participated in ENCOD's 'Spread the Seeds' campaign and coordinated a public demonstration in Warsaw. In Slovakia, the non-governmental organisation (NGO) 'Free Choice' was established, as a response to the repressive legislative situation in February 2004. Its goal is to 'invoke discussion about cannabis and its legalisation and demythologise the plant that has been used for hundreds of years as food, a cure, for industry or pleasure'. In Slovenia, the Konoplja.org project campaigns for cannabis users to be given a political voice, together with the depenalisation of cannabis and the introduction of alternative sentences or admonitions. Every year, the Million Marijuana March is organised in Ljubljana and Maribor, where users can freely smoke cannabis (trafficking is forbidden) and point out that changes are necessary. In the Baltic States, Cyprus and Malta, activist groups exist, but are more covert and far less active and professional than in the above-mentioned countries. In the Baltic States, their main forum is the Internet, where they present articles and reports related to cannabis and its effects. There are also discussion forums and other information (legislation, pictures, smokers' stories, instructions on how to grow cannabis at home, extracts from legal acts, etc.).

Discussion

Eight out of the ten new EU Member States have undergone recent transformations from a centrally planned economy to a market economy, and from a single-party system to a pluralist political system. This shift has ushered in not only positive social developments but also a variety of problems which are measurable by 'objective' statistics and are often magnified in the public perception (Leifman, Edgren Henrichson, 1999). Drug problems, despite their high media exposure, are considered less important compared with other burning social issues such as unemployment, poverty and even alcoholism. Nevertheless, a rapid increase in drug use is recorded by relevant statistics (Moskalewicz and Świątkiewicz, 2005).

Based on current data it is difficult to fully explore determinates of cannabis use in the new EU Member States and, therefore, some of the explanations offered in this chapter are hypothetical and need more research. The data do, however, point towards broad trends and crucial and intriguing issues, which should be monitored and researched more closely.

Cannabis is a widely used illicit drug in the 10 new EU Member States, particularly among teenagers and young adults. Its prevalence used to be somewhat lower than in the EU-15, but a rising tide of cannabis use in the years 1995–2004 has meant that the new EU Member States are reaching approximately the same prevalence rates as the rest of Europe (EMCDDA, 2004).

The sudden rise in cannabis use in all the new countries — except for Cyprus and Malta — has accompanied root-and-branch social change, which could have increased demand for psychoactive substances. Significant influences have been imported from the pre-2004 Member States, where cannabis use was more widespread and normalised than it used to be in the new Member States before the 1990s. Intensive transmission of Western European consumption patterns has affected drug use patterns in general, including cannabis. Young men and boys seem to be more open to the new patterns, particularly in the more religious societies (Cyprus, Lithuania, Malta, Poland) where the gender ratios in prevalence of cannabis use range from 2:1 to 4:1. In other, more secular cultures, such as the Czech Republic, this ratio is 1:1. The gender gap tends to narrow in practically all countries that have a tradition of female emancipation. As in other parts of the world, Westernisation first affects capital cities and larger urban centres. This is reflected by the dynamic geographic spread of cannabis in the countries, which has spread fast from large cities to smaller towns and then to the countryside.

This Westernisation hypothesis is supported by the fact that new EU countries with the highest cannabis prevalence — the Czech Republic, Slovenia and Slovakia, and to a lesser extent Hungary and Poland — are also those which are closest to pre-2004

Member States. The process of cultural homogenisation of Europe seems to be most advanced among younger generations, which are more willing to adopt new cultural patterns, including cannabis use. The image of cannabis has a very positive connotation in the context of rasta and hip-hop culture, both of which are international youth cultures. Cannabis is also popularised by movies, music and souvenirs. The force exerted by these influences seems to be higher in Central Europe, especially when comparing the Czech Republic with the Baltic States, Cyprus and Malta.

The low prevalence of cannabis use in Cyprus and Malta may also have its roots in culture. Unlike in the remaining continental countries, where cannabis has been integrated into teenage culture, particularly in large cities, cannabis for young Cypriots may be associated with traditional hashish waterpipes smoked by middle-aged and elderly men, and therefore have a much less attractive cultural appeal. In Malta, being a smaller country where social stigmas may be felt to a greater extent, open views about cannabis use may be more restricted.

Increasing cannabis consumption can be explained by its growing availability, which is confirmed by subjective opinions collected by the ESPAD study in all countries. The availability hypothesis has been backed up by data from international and national control agencies that focus on the supply side of the drug market. Nevertheless, our study suggests that the availability increase is a phenomenon present in all countries, including those where consumption has tended to level off, such as Cyprus, Malta and Slovenia. Moreover, it is difficult to explain large gender gaps in cannabis consumption recorded in a number of countries, despite its similar availability for boys and girls (see Hibell and Andersson, this monograph).

Cannabis prevalence cannot be explained by its affordability. There is no linear relationship between the economic situation of the country and its level of cannabis use. However, experiences in the new EU members suggest that the income-price elasticity of cannabis demand is much higher in those countries whose currencies recently became convertible and where incomes expressed in terms of convertible currencies tended to grow fast. In more stable economies, cannabis price elasticity is much lower.

Public discussion tends to demonise drugs, to place cannabis on a par with other illicit drugs, and generally to portray drug use as something dangerous. Illicit drug use in society is also generally stereotyped (Young, 1971: 182), and despite idiosyncrasies among the 10 countries, common features include the high social visibility of the drug problem and the negative image of drug addicts in general. Since the Eastern European countries undergoing transition still suffer from many unsolved social problems, drugs have been attributed the role of the 'good enemy' (Christie and Bruun, 1986); that

is, drugs are seen as a straightforward political target, rather than attempts to resolve urgent matters such as the problems of disadvantaged groups, inequality in the employment market and undeveloped regional policy. However, especially regarding cannabis, it is possible to make distinctions between regions. In the Central European countries (Czech Republic, Hungary, Poland, Slovenia and Slovakia), cannabis has a higher social visibility than in the other countries, where the social perception of drug use is focused mainly on problem drug use. Nonetheless, since illicit drug use is a relatively new phenomenon in all of these countries, the older generations tend to have naive and homogenous views of drugs and drug users. Perhaps reflecting such concerns, the majority of new EU countries have recently introduced legislation that is more restrictive than under previous regimes.

Rapid political change in 8 out of the 10 new EU member countries and increasing integration with the EU has had a serious impact on drug policy. All these countries have become more open and more vulnerable to external pressures, particularly from the most powerful allies, such as the USA, which has attempted to exert its influence through relevant UN agencies and by targeting professionals as well as policymakers and politicians. Nordic countries, too, have tended to export their restrictive drug policies, especially across the Baltic Sea. On the other hand, pre-2004 EU members must also have felt the impact of enlargement in this area. Existing European divisions in drug policy may be reinforced by the new Member States, which are more likely to join coalitions of more restrictive countries.

The social response to cannabis is overwhelmingly dominated by individually oriented approaches, that is, law enforcement and treatment. From incomplete data it can be estimated that the number of cannabis users dealt with by law enforcement agencies is much higher than those in medical treatment. This results from increasingly repressive legislation which applies penalties even for possession of small amounts for personal use, which in fact implies penalisation of use. In some countries presence of cannabis in body fluids may legally be interpreted as possession. Such legislation implies that referrals to medical treatment, where present, are used as much as a social control as a psychosocial care method. In most countries cannabis-specific treatment is not widely available, and cannabis dependence is accepted as a phenomenon, which is not considered as requiring specific treatment centres and methods. Treatment of cannabis clients is integrated in general drug treatment settings which focus on opiate-dependent individuals. Thus, the growing share of cannabis users in medical treatment probably reflects referrals from the criminal justice system rather than impressive advances in treatment methods.

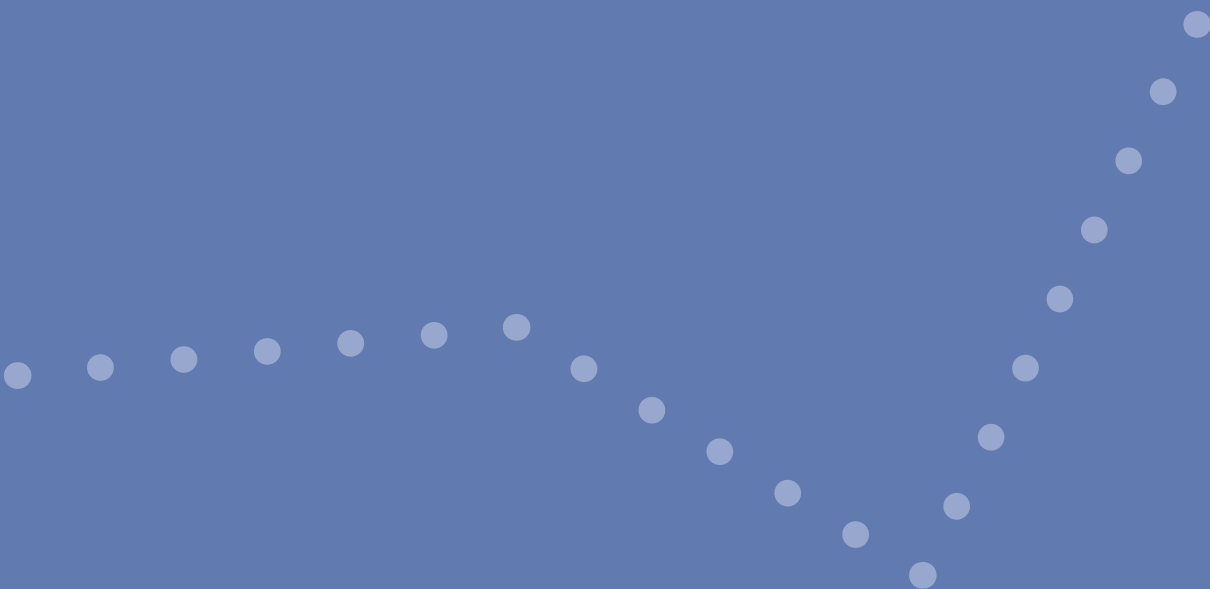
Bibliography

- Allaste, A. A., Lagerspetz, M. (2005), 'Drugs and double-think in marginalised community', *Critical Criminology* 13: 267–285.
- Booth, M. (2004), *Cannabis: a history*, St. Martin's Press, New York.
- Butler, G. K., Montgomery, A. M. (2004), 'Impulsivity, risk taking and recreational ecstasy (MDMA) use', *Drug Alcohol Dependence* 76: 55–62.
- Christie, N., Bruun, K. (1986), *Hyvä vihollinen. Huuhausainepolitiikka Pohjolassa* (Good enemy: Drug policy in Nordic Countries), Weilin and Göös, Espoo.
- Demetrovics, Zs. (1998), 'Drugs and disco in Budapest: smoking, alcohol consumption and drug-using behaviour among youths in the clubbing subculture' (in English), Regional Resource Centre, Budapest.
- Demetrovics, Zs. (2001), 'Droghasználat Magyarország táncos szórakozóhelyein' (Drug use in Hungarian clubbing subculture), L'Harmattan Kiadó, Budapest.
- Demetrovics, Zs. (2005), 'The characteristics of psychostimulant use in the Hungarian party scene', Abstracts of *The Inaugural European Association of Addiction Therapy Conference Budapest*, 6–8 July 2005, 13.
- EMCDDA (2004), *Annual report: the state of the drugs situation in Europe*, European Monitoring Centre for Drugs and Drug Addiction, Lisbon.
- EMCDDA (2005), *Annual report 2005*, European Monitoring Centre for Drugs and Drug Addiction, Lisbon.
- EMCDDA (2006), 'Web page: 'Possession of cannabis for personal use'', European Monitoring Centre for Drugs and Drug Addiction, Lisbon
<http://eldd.emcdda.europa.eu/index.cfm?fuseaction=public.Content&nnodeid=5769>
- Encyklopédia Slovenska* [Encyclopedia of Slovakia], part III (1979), VEDA, SAV, Bratislava, 156.
- Fatygá, B. and Sierośławski, J. (1999), 'Uczniowie i nauczyciele o stylach życia i narkotykach', Raport z badań jakościowych, Instytut Spraw Publicznych, Warsaw.
- Flaker, V. (2002), 'Heroin use in Slovenia: social consequence or social vehicle', *European Addiction Research* 8: 170–176.
- Hibell, B., Andersson, B. (2008), 'Patterns of cannabis use among students in Europe', this monograph.
- Hibell, B., Andersson, B., Bjarnasson, T., Kokkevi, A., Morgan, M., Narusk, A. (1997), *The 1995 ESPAD report: alcohol and other drug use among students in 26 European countries*, The European School Survey Project on Alcohol and Other Drugs, CAN, Stockholm.
- Hibell, B., Andersson, B., Ahlström, S., Balakireva, O., Bjarnasson, T., Kokkevi, A., Morgan, M. (2000), *The 1999 ESPAD report: alcohol and other drug use among students in 30 European countries*, The European School Survey Project on Alcohol and Other Drugs, CAN, Stockholm.
- Hibell, B., Andersson, B., Bjarnasson T., Ahlström S., Balakireva O., Kokkevi A., Morgan M. (2004), *The 2003 ESPAD report: alcohol and other drug use among students in 35 European countries*, The European School Survey Project on Alcohol and Other Drugs, CAN, Stockholm.
- Kärđi, V. (1993), 'Marihuana ja hashishi tarvitajatest Eestis' [About marijuana and hashish users in Estonia], *Vikerkaar* 8 (5): 54–61 and 8 (6): 58–63.
- Kvaternik, J. I. (2004), 'Drugs as an element of political relations: human rights on the example of the subculture of drug users', University of Ljubljana, Faculty for Social Studies, Ljubljana.
- Laidmäe, I., Allaste, A. A. (2004), 'Tervis' (Health), in Hansson, L. (ed.) *Valikud ja võimalused: argielu Eestis aastatel 1993–2003* [Choices and opportunities in everyday life in Estonia 1993–2003], Pedagoogilise Ülikooli Kirjastus, Tallinn, 118–143.
- Leifman, H., Edgren Henrichson, N. (1999), 'Statistics on alcohol, drugs and crime in the Baltic Sea region: NAD Change, Helsinki', *European Addiction Research* 8: 170–176.

- Milani, R. M., Parrott, A. C., Schifano, F., Turner, J. J. (2005), 'Pattern of cannabis use in ecstasy polydrug users: moderate cannabis use may compensate for self-rated aggression and somatic symptoms', *Human Psychopharmacology* 20: 246–263.
- Misztal, B. (2003), *Theories of Social Remembering*, Open University Press, Philadelphia.
- Moskalewicz, J., Świętkiewicz, G. (2005), 'Nadużywanie substancji psychoaktywnych na tle innych problemów społecznych w Polsce (Drug abuse in Poland against other social problems)', in Piątkowski, W., Brodniak, W. A. (eds) (2005) *Zdrowie i choroba. Perspektywa socjologiczna (Health and illness: a sociological perspective)*, Wyższa Szkoła Społeczno-Gospodarcza, Tyczyn, 203–216.
- Moskalewicz, J., Świętkiewicz, G., Dąbrowska, K. (2004), 'Ecstasy use in Warsaw: do cultural norms prevent harm?', in Decorte, T., Korf, D. J. (eds), *European studies on drugs and drug policy*, VUB Press, Brussels, 179–193.
- Mravčík, V., Korčíšová, B., Lejčková, P., Miovska, L., Škrdlantová, E., Petroš, O., Radimecký, J., Sklenář, V., Gajdošíková, H., Vopravil, J. (2004), *Annual Report of the Czech Republic — drug situation 2003*, Office of the Government of the Czech Republic, Prague.
- Mravčík, V., Korčíšová, B., Lejčková, P., Miovska, L., Škrdlantová, E., Petroš, O., Sklenář, V., Vopravil, J. (2005), *Annual report of the Czech Republic — 2004 drug situation*, Office of the Government of the Czech Republic, Prague.
- Paksi, B. (2000), 'A szintetikus szerek képe a magyarországi sajtóban (Presentation of drugs in the Hungarian media)', in Demetrovics, Zs. (ed.), *Diszkódrogok, drogfogyasztók, szubkultúrák (The World of Synthetic Drugs. Disco drugs, drug users, subculture)*, Animula, Budapest.
- Paksi, B. and Demetrovics, Zs. (2002), *A drogprevenció gyakorlat megismerése. (Evaluation of school prevention programmes)*, L'Harmattan, Budapest.
- Parker, H., Aldridge, J., Measham, F. (1998), *Illegal leisure: the normalisation of adolescent recreational drug use*, Routledge, London.
- Tossman, P., Boldt, S., Tensil, M-D. (2001), 'The use of drugs within the techno party scene in European metropolitan cities', *European Addiction Research* 7: 2–23.
- Young, Y. (1971), *The drugtakers: the social meaning of drug use*, Paladin, London.
- Zimmermann, P., Wittchen, H. U., Waszak, F., Nocon, A., Hofler, M., Lieb, R. (2005), 'Pathways into ecstasy use: the role of prior cannabis use and ecstasy availability', *Drug Alcohol Dependence* 79: 331–341.

Policies, legislation and control strategies

PART II



Chapter 7

Cannabis control in Europe

Keywords: cannabis – decriminalisation – drug policy – Europe – legislation
– international law – UN convention

Setting the context

The history of cannabis has been the subject of numerous books in recent years (see Fankhauser, this monograph). One of the many historical perspectives that have been explored is cannabis's social, political and legislative history. This chapter provides a brief history of controls on cannabis, and analyses a series of recent government enquiries that have informed legislative reform, particularly in Europe.

Opinions are divided in this area. Liberalisers and cannabis advocacy groups — the key Internet publishers of information on the issue — continue to claim cannabis is a recently controlled substance and 'natural product', and have espoused a number of theories to explain its prohibition ⁽¹⁾. Yet the historical picture is more complex. Use of cannabis as a psychoactive drug has stirred controversy for centuries. And finding the most appropriate control system has interested professionals, politicians and governments from the beginning.

Today, international drugs conventions recommend signatories to designate, under national legislation, the most stringent control over cannabis. However, some countries have used the granted discretion to move away from such recommendations. A cross-

⁽¹⁾ Among others, theories include: diplomatic dealmaking (with Turkey and Egypt) during the 1925 amendment to the *International Opium Convention*; timber interests curbing hemp industry growth in the USA (particularly involving a marijuana scare campaign by media, controlled by William Randolph Hurst); synthetic fibre interests curbing hemp industry growth (in particular Du Pont); inter-agency conflict between the FBI and FBN in the USA (with Harry J. Anslinger cast as arch-prohibitionist); cannabis control as a result of institutionalised racism (stigmatising cannabis as a drug of choice of specific racial groups, especially in the USA); and strong international focus on stringency by the United Nations (INCB and UNODC).

reading of governmental enquiries shows that, while cannabis is considered a potentially dangerous substance, its dangers, in comparison with other controlled substances, may have been overstated and alternative forms of sanctions, such as civil sanctions, fines or compulsory health assessments, have been recommended in place of criminal penalties.

European countries' laws or prosecution policies seem to be broadly in accord with these government enquiries. Nonetheless, more liberal positions have attracted some concerns, expressed in particular at UN level, on the grounds that leniency on cannabis can endanger the overall international effort against drugs. Accordingly, the latest developments in some countries seem to tip the balance back towards a new attention on restrictive measures.

Further reading

BBC Timeline (2005), 'The use of cannabis'

<http://news.bbc.co.uk/2/hi/programmes/panorama/4079668.stm>

Böllinger, L., Stöver, H., Fietzek, L. (eds) (2002), *Drogenpraxis, Drogenrecht, Drogenpolitik: Ein Leitfaden für Drogenbenutzer, Eltern, Drogenberater, Ärzte und Juristen*, FHS Frankfurt.

EMCDDA (2001, updated 2006), *ELDD: possession of cannabis for personal use*, available at <http://eldd.emcdda.europa.eu/index.cfm?nNodeID=5769>

EMCDDA (2005), *Thematic papers — illicit drug use in the EU: legislative approaches*
www.emcdda.europa.eu/index.cfm?nnodeid=7082

Hall, W., Pacula, R. (2003), *Cannabis use and dependence: public health and public policy*, Cambridge University Press, Cambridge.

Inglis, B. (1975), *The forbidden game: a social history of drugs*, Hodder and Stoughton, London.

Mills, J. (2003), *Cannabis Britannica: empire, trade and prohibition 1800–1928*, Oxford University Press, Oxford.

Palazzolo, J. (2006), *Le cannabis en question*, Hachette, Paris.

See also the list of governmental reviews (Table 1) in this chapter and the grey literature list in the Appendix to Volume 1 of this monograph (p. 300).

Cannabis control in Europe

Danilo Ballotta, Henri Bergeron and
Brendan Hughes

Introduction

The use of cannabis as a psychoactive substance has always been a subject of controversy. International drugs conventions recommend signatories to designate, under national legislation, the most stringent control over cannabis, but some countries have used the granted discretion to move away from such recommendations. Indeed, finding the most appropriate control system has interested professionals, politicians and governments since the beginning. A cross-reading of governmental enquiries shows that, while cannabis is considered a potentially dangerous substance, its dangers in comparison with other controlled substances might have been overstated, and alternative forms of sanctions, such as civil sanctions, fines or compulsory health assessments, have been recommended in place of criminal penalties. European countries' laws or prosecution policies seem to be broadly in accord with such enquiries, but these positions have attracted some concerns, expressed in particular at UN level, on the grounds that such a 'lenient approach to cannabis' can endanger the overall international effort against drugs. Accordingly, the latest developments in some countries seem to tip the balance towards a new attention on cannabis through restrictive measures.

Cannabis: a substance under continuous control

Origins of control

Cannabis has been used for a variety of purposes for thousands of years. Yet in Europe, consumption remained mostly limited to experimentation by small elites or to those having contact with specific countries, in particular North Africa and India (Booth, 2003). There is significant evidence to suggest that cannabis has always been a controversial or troubled substance, and was placed under some sort of restriction almost as soon as its psychoactive effects were discovered.

In 2000 BC in India, religious authorities used cannabis in holy rituals and it is likely that only priests had access to it (Booth, 2003). In the Muslim world in medieval times there existed an ambivalent attitude towards the use of cannabis (Hamarneh, 1957). Hashish, furthermore, had derogatory associations with Sufism and as a precipitator of

madness (Booth, 2003). Key critics of cannabis include the theologian Ibn Taymiyyah, the judge Ibn Ganim and historian Al Magrii. Much-cited examples of controls include the prohibition in 1265 of cannabis in Damascus by King al-Zahir Baybars (Hamarnah, 1957), and the destruction of cannabis plants and prohibition of cannabis use in 1378 by the Ottoman emir of Egypt, Soudoun Sheikouni (Rosenthal, 1971; Caballero and Bisiou, 2000; Arana and Márquez, 2006). In Europe in 1484 Pope Innocent VIII associated the use of hashish with witchcraft in the bull *Summis Desiderantes* (Booth, 2003). Such examples, though anecdotal, illustrate that controversy surrounding cannabis use is not a new phenomenon.

Some precursors of controls relating to cannabis can be found in Europe's colonial period, though outside the continent itself. Following Napoleon's invasion of Egypt in 1798, in 1800 he prohibited his soldiers to smoke or drink the extracts of the plant, imposing a penalty of imprisonment of three months, thus implementing perhaps the first 'penal law' on cannabis. A law in South Africa in the 1870s, that was tightened in 1887, prohibited the use and possession of *dagga* (cannabis) by Indian immigrants, largely in response to a perception that its use by them was dangerous for white rule (Booth, 2003). In India, prohibition of cannabis was mooted in 1838, 1871, 1877 and, most famously, rejected following an extensive 3000-page report by the *Indian Hemp Drugs Commission* in 1894. Nonetheless, despite rejections of a blanket ban, various Indian cities and states issued quotas, tax regimes or restrictions on cannabis (Booth, 2003).

While familiarity with cannabis products in the pharmaceutical sphere was widespread in the early 20th century (Lewin, 1924; Fankhauser, this monograph), within Western Europe there is little evidence of significant cannabis prevalence and criminal prosecutions until after the Second World War. Cannabis control is best viewed in the context of national and international initiatives in the area of drug control during the late 19th and early 20th centuries — in particular, relating to opiates, together with increased supervision of pharmaceutical products in general. Controls in Europe focused on regulating pharmaceutical use of cannabis. For example, in Germany, the first legal act on cannabis was in a Pharmacy Ordinance of 1872 when the sale of Indian hemp was limited to pharmacies (this ordinance was still valid in 1920) (see Fankhauser, this monograph).

However, in Greece and near-neighbour countries such as Turkey and Egypt, cannabis prevalence was higher and attracted strong legal responses. Hashish possession was made a capital offence in Egypt in 1868, with a tax on cannabis imposed in 1874, although exemptions for non-Egyptians and enforcement issues led to them being ineffectual (Booth, 2003). In Turkey a nationwide campaign to confiscate and destroy cannabis was begun by the Sultan in 1877, and an import ban imposed in 1879; in 1884 cultivation of cannabis became a criminal offence (Abel, 1980). In Greece

cultivation, importation, and usage of cannabis was banned in 1890, based on concern for hashish use among the poor. Nonetheless, Greece was a significant exporter of hashish to Turkey and Egypt into the 1920s (Abel, 1980).

Prior to the First World War, international agreements on narcotic substances increased the mechanisms of control on opium and related substances. For opiates, the Opium Commission in Shanghai in 1909 contributed to a framework agreement on opium control at the First International Opium Conference in the Hague in 1911–1912. While the Hague conference concentrated on opium, at this conference Italy lobbied for an international ban on cannabis, largely based on hashishism in its protectorates Tripolitania and Cyrenaica (obtained from Turkey during a war in 1911). In the USA, a number of states also prohibited non-medical use of cannabis: California (1915), Texas (1919) and Louisiana (1924). A parallel development was legal restriction on alcohol use: a ban in Finland (1919) and the USA (1920), and a rationing system in Sweden (from 1914). In Switzerland cannabis was outlawed in 1924.

The key driver of international cannabis prohibition in the early 20th century was an amendment to the International Opium Convention (1925), which was extended beyond opiates to embrace cannabis. The convention prohibited the export of cannabis resin to countries that prohibited its use (Bayer and Ghodse, 1999). The process behind the inclusion of cannabis in the convention has been both heavily discussed (e.g. Lowes, 1966) and roundly criticised (e.g. Kendell, 2003; Holzer, 2004). There is consensus that the cannabis subcommittee advising the Second League of Nations Opium Conference succumbed to strong Egyptian demands for a ban on cannabis and that delegates were certainly given little time to conduct due diligence on materials (Booth, 2003; Kendell, 2003; Holzer, 2004).

Following the approval of the 1925 International Opium Convention, European countries gradually outlawed cannabis use and possession (e.g. the UK's *Dangerous Drugs Act*, 1928; Germany's second *Opium Law*, 1929). Nonetheless, the first substantial wave of convictions for cannabis offences did not occur until the 1960s. Official crime reports in the 1960s and 1970s did not differentiate cannabis convictions from those for other illicit drugs, yet studies suggest that there were very few cases other than cannabis. Böllinger suggests that the bulk of the less than thousand 'narcotics cases' (police registrations) before 1960 in Germany related to the 'stem of old morphinists' (Böllinger et al., 2002). In Canada the first known seizure of marijuana did not occur until 1932, but widespread enforcement is reported much later, with a total of 261 convictions for drug offences in 1960 (the majority, however, for heroin offences). In the Netherlands, in the first half of the 20th century, no problems or social controversy are reported on cannabis, but the opium law was revised in 1953 to include cannabis and comply with international treaties. Thus, some authors (e.g. Fischer et al., 1998) have argued that prohibition was introduced mainly in response to international

obligations — in a broader diplomatic context — than to answer to an urgent problem at national level between law and enforcement (or necessity of it), as ‘the solution without the problem’ ⁽²⁾.

International law

The United Nations Single Convention on Narcotic Drugs (1961) elevated the control on narcotic substances and on cannabis to a global level. Under the system introduced in 1961 (mainly imported from previous treaties), cannabis is to be considered as one of the most dangerous existing drugs ⁽³⁾.

This section discusses the texts of the UN Convention. While this approach may appear legalistic to the non-specialist reader, a thorough understanding of the legal status of cannabis under international law is vital for understanding the ‘room for manoeuvre’⁽⁴⁾ given to different countries on the issue.

Cannabis, cannabis resin and extracts and tincture of cannabis are listed in Schedule I of the 1961 Convention among substances whose properties might give rise to dependence and which present a serious risk of abuse, which are subject to all control measures envisaged by the Convention ⁽⁵⁾. Cannabis and cannabis resin are again listed in Schedule IV of the 1961 Convention, which comprises 15 substances already listed in Schedule I that are considered particularly dangerous by virtue of their harmful characteristics, risks of abuse and extremely limited therapeutic value. Among these 15 substances, we find heroin and cannabis but not cocaine, which is (only) listed in Schedule I.

⁽²⁾ Giffen et al. (1991) affirm that ‘unlike other narcotic drugs brought under federal control up to the 1920s, marijuana was added to the Schedule I in 1925, before it came to be defined as a social problem in Canada. Why this was so remains a mystery’.

⁽³⁾ Article 2.5(a) of the 1961 Convention introduces the concept of dangerousness for substances included in schedule IV.

⁽⁴⁾ ‘Room for manoeuvre’ was the title of a report commissioned by the British charity Drugscope, with a focus on the UN conventions and potential changes to UK drugs possession laws (Dorn and Jamieson, 2000).

⁽⁵⁾ There are four schedules under the 1961 Single Convention on Narcotic Drugs: Schedule I — those substances which are, inter alia, having, or convertible into substances having a liability to abuse comparable to that of cannabis, cannabis resin or cocaine; Schedule II — having addiction-producing or addiction-sustaining properties not greater than those of codeine but at least as great as those of dextropropoxyphene; Schedule III — preparations which are intended for legitimate medical use, and which the WHO considers not liable to abuse and cannot produce ill effects, and the drug therein is not readily recoverable; and Schedule IV — substances that are particularly liable to abuse and to produce ill effects, and such liability is not offset by substantial therapeutic advantages not possessed by substances other than drugs in Schedule IV.

As specified by the 2001 INCB Annual Report, ‘to be included in Schedule IV, a drug has to be considered particularly liable to abuse and to produce ill effects, and such liability should not be offset by substantial therapeutic advantages’. In the view of the delegations present at the Plenipotentiary Conference that prepared the 1961 Convention, cannabis certainly presented such characteristics (though cocaine, for example, did not). THC, the main psychoactive ingredient of cannabis, is also listed by the 1971 Convention on Psychotropic Substances, in the first of four schedules, its use being prohibited except for scientific and very limited medical purposes (Article 7a) ⁽⁶⁾.

This composite classification reflects the concern about the abuse of cannabis and the desire of the convention promoters to advise countries to design, under national legislation, the most stringent control on cannabis ⁽⁷⁾. Indeed, this *double classification* (Schedule I plus Schedule IV, 1961 Convention) allows signatory countries to adopt any special measures of control regarded as *necessary*, including prohibition of use, due to the ‘particularly dangerous properties’ of the drugs listed in Schedule IV. However, a country shall adopt any special measures of control *if considered necessary* having regarded the particularly dangerous properties of drugs in Schedule IV ⁽⁸⁾. The non-obligation of this norm, in fact a condition for its implementation, is confirmed by the UN Commentary on the 1961 Convention, which restates that a party is ‘obliged to apply special measures only if it believes them to be necessary’ ⁽⁹⁾.

⁽⁶⁾ There are four schedules under the 1971 UN Convention on Psychotropic Substances: Schedule I — substances whose liability to abuse constitutes an especially serious risk to public health and which have a very limited, if any, therapeutic usefulness; Schedule II — substances whose liability to abuse constitutes a substantial risk to public health and which have little to moderate therapeutic usefulness; Schedule III — substances whose liability to abuse constitutes a substantial risk to public health and which have moderate to great therapeutic usefulness; and Schedule IV — substances whose liability to abuse constitutes a smaller but still significant risk to public health and which have a therapeutic usefulness from little to great.

⁽⁷⁾ The UN documents of the years preceding the signatures of the 1961 and 1971 Conventions confirm a particular concern towards cannabis. In 1959 countries were requested ‘to increase their efforts to suppress the illicit cultivation of cannabis’ (CND Decision 14 December (XIV) April/May 1959). In 1968 they were recommended to ‘increase their efforts to eradicate the abuse of and illicit traffic in cannabis’ or to ‘promote research and advance additional medical and sociological information regarding cannabis, and effectively deal with publicity which advocates legalisation or tolerance of the non-medical use of cannabis as a harmless drug (Economic and Social Council E/RES/1968/1291(XLIV), 1520th Plenary Meeting, 23 May 1968, on the abuse of cannabis and the continuing need for strict control). An extract from E/RES/1959/730(XXVIII)E 1088th Plenary Meeting, 30 July 1959, reads as follows: ‘Recalling that the third draft of the Single Convention on Narcotic Drugs contains an express provision for the prohibition of the medical use of cannabis drugs except in certain systems of indigenous medicine’. An extract from Economic and Social Council Resolution IV(XII) on the question of cannabis, April/May 1957, ‘Requests all Governments to abolish, except for medical (Ayurvedic, Unani and Tibbi systems) and scientific purposes, the legal consumption of all substances having a cannabis base within a reasonable period where it has not been done so far’.

⁽⁸⁾ Article 2.5(a), 1961 Convention.

⁽⁹⁾ UN Commentary on the 1961 Single Convention (p. 65).

It seems, therefore, that the 1961 Convention suggests to apply the most stringent control system to cannabis, yet leaves countries some flexibility in their interpretation of the *necessity* of such control. According to this classification, use and possession of cannabis should not be allowed except for authorised medical or scientific purposes (Articles 4c, 33, 36, 1961 Convention). Countries are requested to prevent its misuse (Article 28, 1961 Convention) and take all practicable measures for the prevention of its abuse (article 38, 1961 Convention). They should also not permit its possession (Article 33, 1961 Convention) and if they decide to do so, they are entitled to make possession of cannabis a punishable offence (Article 36, 1961 Convention), and are mandated to make possession for the purpose of trafficking an offence of criminal nature (Article 3, paragraph 1(a)(iii), 1988 Convention). Possession for personal consumption may also be criminalised (Article 3 paragraph 2, 1988 Convention).

This system of provisions leaves no doubt about the severity requested towards cannabis and it is evident that signatory countries cannot allow non-medical use of cannabis, such as in a hypothetical *legalisation regime*, without renouncing the UN Conventions. They must set measures to discourage, prevent or — if considered necessary — prohibit and punish personal use of cannabis ⁽¹⁰⁾.

All this is, however, largely based on the *acceptance* of the Conventions by the signatory countries. This means that countries must judge the *opportunity* and *necessity* of applying the convention norms. Conventions are, in fact, not *self-executing* and in the transposition of the international dictate into national law, countries are allowed discretion, while applying the principle of good faith in interpreting international agreements. This is visible throughout in the presence of safeguard clauses in the text of the Conventions: *subject to constitutional limitations* (Article 36.1, 1961 Convention); *subject to basic concepts of national legal systems* (Article 3, paragraph 2, 1988 Convention); *the Parties shall as far as possible* (Article 26, paragraph 2, 1961 Convention); *these measures are necessary or desirable* (Article 22 and Article 30, paragraphs 2 and 4, 1961 Convention). Nevertheless, states should interpret treaties in good faith and in the light of their object and purpose, according to Article 31 of the 1969 Vienna Convention on the Law of Treaties.

A constant quest for evidence

By 1970, 64 states had ratified the Single Convention on Narcotic Drugs and with it the control system required for cannabis. Nevertheless, the fact that cannabis was treated no differently, even more strictly, than other substances that were perceived to be more dangerous provoked uncertainty within governments and parliaments.

⁽¹⁰⁾ An expression that, according to the country considered, might mean use of cannabis or possession of small quantities of cannabis for personal use or both.

There is evidence to suggest that disagreements embraced the question of the international *classification(s)* of cannabis from its beginning. Already, during the Plenipotentiary Conference, which drafted the 1961 Convention, controversies arose around the question of whether the prohibition of drugs in Schedule IV should be mandatory or only recommended. More recently, some authors see the insistence of certain countries to place cannabis under the strictest control regime in the convention as the main reason for such classification (Canadian Senate Report on Cannabis, 2002). Others go so far as to use the words 'arbitrariness' when addressing cannabis classification (Caballero and Bisiou, 2000).

Evidently, the question of the classification of cannabis or of its derivatives is controversial and has arisen from time to time ⁽¹¹⁾. In 2003 the WHO Expert Committee on Drug Dependence ⁽¹²⁾, following a *Critical Review* ⁽¹³⁾, recommended the rescheduling of dronabinol (THC, the main active principle of cannabis), to Schedule IV of the 1971 Convention ⁽¹⁴⁾. This would mean that the active principle of cannabis would be moved from a schedule where substances have very limited, if any, therapeutic usefulness and their abuse constitutes an especially serious risk to public health, to a schedule where substances have some therapeutic usefulness with a smaller (but still significant) risk to public health due to their liability of abuse. If implemented, this would probably have important consequences on the overall classification of cannabis and on its control requirements worldwide, but no further procedural steps have been taken.

⁽¹¹⁾ ARF/WHO Scientific Meeting on Adverse Health and Behavioural Consequences of Cannabis Use, WHO and the Addiction Research Foundation of Ontario, 1981; *Cannabis: a health perspective and research agenda*, Division of Mental Health and Prevention of Substance Abuse, World Health Organisation, 1997.

⁽¹²⁾ The WHO Expert Committee has the task of carrying out medical and scientific evaluations of the abuse liability of dependence-producing drugs falling within the terms of the 1961 Single Convention on Narcotic Drugs and the 1971 Convention on Psychotropic Substances. It then makes recommendations to the United Nations Commission on Narcotic Drugs on the control measures, if any, that it considers appropriate. The Expert Committee's reports are published by WHO in the Technical Report Series.

⁽¹³⁾ A Critical Review is an assessment process in which the Expert Committee, on the basis of (1) a notification from a Party to the 1961 or the 1971 Convention concerning the scheduling of a substance; (2) an explicit request from the UN Commission on Narcotic Drugs to review a substance; (3) a pre-review of a substance which has resulted in a recommendation for critical review; (4) information sent to the attention of the WHO that a substance of especially serious risk to public health and society, and of no recognised therapeutic use by any Member State, is clandestinely manufactured, with analysis of the substance according to its similarity to known substances and effects on the central nervous system, dependence potential, actual abuse and/or evidence of likelihood of abuse, therapeutic usefulness, and providing recommendations for scheduling or non-scheduling.

⁽¹⁴⁾ The WHO Expert Committee report recommend that 'all stereochemical variants of delta-9-tetrahydrocannabinol be moved to Schedule IV of the 1971 Convention', and that this is 'to avoid placing different stereochemical variants of the same substance under different control systems'. We have, in fact, to remind that in 1990 the WHO Expert Committee proposed the rescheduling of dronabinol, a stereochemical variant of delta-9-tetrahydrocannabinol, to Schedule II of the 1971 Convention.

In response to the WHO, the INCB expressed its concern in its 2003 report about this possible rescheduling of THC. In March 2006 the WHO Expert Committee on Drug Dependence concluded that dronabinol (THC) constitutes a substantial risk to public health, but the risk is different from that of cannabis, and it has moderate therapeutic usefulness. As a result, it recommended that dronabinol and its stereoisomers should be rescheduled from Schedule II to Schedule III of the 1971 Convention (WHO, 2006). At the 50th UN Commission on Narcotic Drugs in March 2007, members agreed to postpone any decision on dronabinol until more conclusive evidence is available, although firm opposition to the rescheduling was expressed by some delegates.

At the level of national authorities, evaluations of cannabis have been carried out on a regular cycle. The first 'official' enquiries date back to the late 19th and early 20th centuries, for example the Indian Hemp Drugs Commission in 1894, the *Panama Canal Zone Report* in 1925 and the *La Guardia Report* in 1944. The frequency of publication of such enquiries, however, picked up from 1969 onwards and has led to a proliferation of 'official' enquiries in the 1990s and 2000s. Despite their differences in scope, methods and conclusions, the recommendations of these, and older enquiries, reveal interesting common patterns. Three have been isolated for simplicity: (1) cannabis is not a harmless substance; (2) its dangers, in comparison with other controlled substances, have been overstated; and (3) civil sanctions, fines, or compulsory health assessments should be established in place of criminal penalties for personal use offences (Table 1).

Conclusion of reviews 1: cannabis is not a harmless substance

Cannabis is a substance that poses some kind of threats to health for which certain control would be justified. The UK Wootton Report in 1968 affirms that the '*adverse effects that cannabis consumption, even in small amounts, may produce in some people, should not be dismissed as insignificant*'⁽¹⁵⁾. These words were echoed more than 30 years later by the UK *Report of the Advisory Committee on Drug Dependence*, which stated in 2002 that its use '*unquestionably poses risks both to individual health and to society*' (UK Home Office, 2002). This view is also mirrored by other enquiries. For example, the inquiry for the Prime Minister of Jamaica in 2001, affirming that '*it is accepted that cannabis is not entirely safe, even where it is still used for traditional religious rituals, such as in Jamaica*', and that '*despite its proven folk medicinal qualities, its use can be injurious to health*' (National Commission on Ganja, 2001). The general attitude is that cannabis and its derivatives should be maintained as controlled drugs (UK House of Lords, 1998), as governments are responsible for restricting the availability of harmful substances, in particular to prevent the exposure of young people (Canada, 1970; Australia, 1994; New Zealand, 1998).

⁽¹⁵⁾ UK Home Office (1969): cover letter to the Wootton Report sent to the Home Secretary by Chairman Mr Edward Waine, 1 November 1968. See also Abrams, this monograph.

Table 1: Summary of governmental reviews on cannabis control

Title of report	Country	Year
<i>Cannabis: Report by the Advisory Committee on Drugs Dependence ('The Wootton Report')</i>	United Kingdom	1969
<i>Le Dain Report</i>	Canada	1970
<i>Baan and Hulsman Commissions</i>	The Netherlands	1970, 1971
<i>Report of the Expert Group on the Effects of Cannabis Use</i>	United Kingdom, Home Office Advisory Council on the Misuse of Drugs	1982
<i>Legislative options for cannabis use in Australia, Monograph No. 26</i>	Australia	1994
<i>Inquiry into the Mental Health Effects of Cannabis, Report of the Health Committee, AJHR, I.6A</i>	New Zealand	1998
<i>House of Lords Science and Technology Select Committee, Ninth Report, Cannabis: the scientific and medical evidence, HL 151 1997–98</i>	United Kingdom	1998
<i>Swiss Federal Commission for Drug Issues, Cannabis Report</i>	Switzerland	1999
<i>A Report of the National Commission on Ganja to Rt Hon. P. J. Patterson, QC, MP, Prime Minister of Jamaica</i>	Jamaica	2001
<i>The Senate Special Committee on Illegal Drugs, Cannabis: our position for a Canadian public policy</i>	Canada	2002
<i>Report by the Advisory Committee on Drug Dependence, Home Office, The Classification of Cannabis under the Misuse of Drugs Act 1971</i>	United Kingdom	2002
<i>Rapport de la Commission d'enquête du Sénat français sur la politique nationale de lutte contre les drogues illicites, No. 321</i>	France	2003
<i>Report by the Advisory Council on the Misuse of Drugs, Home Office, Further consideration of the classification of cannabis under the Misuse of Drugs Act 1971</i>	United Kingdom	2005

Conclusion of reviews 2: the dangers have been overstated

The identification of cannabis as a potentially dangerous psychoactive substance did not, however, prevent a substantial number of these enquiries to explore the issue of whether current legislation reflected the real dangers posed by cannabis. Already in 1944, the *La Guardia Committee Report on Marihuana* concluded that 'the practice of smoking marihuana does not lead to addiction in the medical sense of the word' and that 'the use of marihuana does not lead to morphine or heroin or cocaine addiction' (Zimmer and Morgan, 1997). In 1968 the Wootton Report stated that 'the dangers of cannabis use as commonly accepted in the past and the risk of progression to opiates have been overstated' and 'cannabis is less harmful than other substances (amphetamines, barbiturates, codeine-like compounds)'. A similar conclusion was

arrived at 34 years later in 2002 when the Advisory Committee on Drug Dependence proposed the reclassification of cannabis from Class B to Class C (enforced by law in 2004 and confirmed in 2005). These views were reiterated by other enquiries, such as the *Baan Committee* in the Netherlands, which affirmed in 1971 that ‘cannabis use does not lead directly to other drug use’⁽¹⁶⁾ or by the US National Commission on Marihuana and Drug Abuse, which in 1973 stated that ‘the existing social and legal policy is out of proportion to the individual and social harm engendered by the use of the drug [cannabis]’⁽¹⁷⁾. The Canadian *Le Dain Commission* saw ‘the UN Single Convention of 1961 as responsible’ for such a situation which ‘might have reinforced the erroneous impression that cannabis is to be assimilated to the opiate narcotics’. The same commission, however, suggested that the UN Convention did ‘not prevent domestic legislation from correcting this impression’⁽¹⁸⁾.

Conclusion of reviews 3: personal use offences do not require criminal sanctions

Endorsing these interpretations, a number of enquiries proposed that criminal sanctions should be withdrawn from private use and/or possession for such use, to create instead a criminal exemption scheme or to impose fines, to decriminalise personal use or just to impose compulsory health assessment. These conclusions were largely based on the belief that criminalising the users of small quantities of cannabis could engender far more harm than good to the society as a whole (e.g. Jamaica, 2001), and that such alternative measures would remove the criminal stigma and the threat of incarceration from a widespread behaviour (possession for personal use) which does not warrant such treatment (US National Commission on Marihuana and Drug Abuse, 1973). The Canadian Senate in 1970 argued that ‘the criminal law should not be used for the enforcement of morality without regard to potential for harm’. Three years later, the US National Commission on Marihuana and Drug Abuse stated that ‘Relieving the law enforcement community of the responsibility for enforcing a law of questionable utility, and one which they cannot fully enforce, would allow concentration on drug trafficking and crimes against persons and property’. The French Senate in 2003 recommended to impose a fine in case of a first offence of drug use (all drugs), and to create an obligation for health or social measures. In 2002 the UK Advisory Committee on Drug Dependence proposed a reclassification of cannabis in the list of controlled substances. The UK government, which endorsed the recommendations to move cannabis from

⁽¹⁶⁾ In Cohen, P. (1994), *The case of the two Dutch drug policy commissions. An exercise in harm reduction 1968–1976*. Paper presented at the 5th International Conference on the Reduction of Drug Related Harm, 7–11 March 1994, Addiction Research Foundation, Toronto. Revised in 1996.

⁽¹⁷⁾ *Marihuana: a signal of misunderstanding. The official report of the National Commission on Marihuana and Drug Abuse*, Raymond P. Shafer, Chairman (1973), 211.

⁽¹⁸⁾ Le Dain, G. et al., *Cannabis: report of the Commission of inquiry into the non-medical use of drugs*. Ottawa: Government of Canada in Report of the Senate Special Committee on Illegal Drugs, ‘Cannabis: our position for a Canadian public policy’, September 2002, Volume II, 278.

Class B to Class C, pointed out that reclassification does not mean that cannabis is legalised or decriminalised, and that possession for personal use still carries a maximum sentence of two years in prison. Yet, following reclassification in the UK, it is unlikely that adults caught in possession of cannabis will be arrested, the usual outcome being a warning and confiscation of the drug. Nonetheless, some instances may lead to arrest and possible caution or prosecution, including repeat offending, smoking in a public place, instances where public order is threatened and possession of cannabis in the vicinity of premises used by children.

A few enquiries went even further, recommending the regulation of cannabis consumption and sale. The Senate Special Committee on Illegal Drugs in Canada recommended in 2002 that the government amend the Canadian legislation in order to create a criminal exemption scheme that would allow ‘for obtaining licences as well as for producing and selling cannabis’. The Senate also asked, as a consequence of this legislative modification, for an amnesty to be declared for any person convicted of possession of cannabis under current or past legislation ⁽¹⁹⁾. Illegal trafficking and export would still attract criminal penalties. In Switzerland, in 1999, the Federal Commission for Drug Issues recommended the removal of the prohibition of consumption and possession of cannabis, and the possibility for cannabis to be purchased lawfully. According to the Federal Commission, clear provisions for the protection of the young and the prevention of all the potential adverse consequences of legalisation ought to be included in the new system. The commission suggested that if the government accepted this model, Switzerland should renounce the Single Convention of 1961 given that these provisions were not compatible with international drug control agreements. In Australia, in 1994, the study undertaken by the government, *Legislative options for cannabis use in Australia*, concluded, more ambiguously, however, that ‘cannabis law reform is required’ and that the reform should be one ‘within the broad categories of prohibition with civil penalties, partial prohibition and relatively free but regulated availability’.

The value of these inquiries — while in many cases limited in the strict scientific point of view — lies in their political significance. The overall picture suggests that cannabis consumption potentially poses risks both to individual health and to society, and on this basis some sort of legal control seems justified. At the same time, it is acknowledged that the dangers of cannabis have in some cases been overstated, that there has been a lack of separation between cannabis and other more dangerous substances and that its consumption does not necessarily lead to crime or other drug use. Alternative forms of criminal sanctions, such as civil sanctions, fines or compulsory health assessments, have been suggested. In a few cases, enquiries have included in their suggested options the regulation of cannabis consumption and sale, while drawing attention to the political impracticability of the option.

⁽¹⁹⁾ Report of the Senate Special Committee on Illegal Drugs, ‘Cannabis: our position for a Canadian public policy’, September 2002, Volume III, recommendations nos. 6 and 7, p. 618.

European Union countries

Classification of cannabis

As far as the classification of cannabis at national level is concerned, the variety of laws and procedures within the EU reflect both the severe requirements as suggested by the UN Conventions and the 'room for manoeuvre' at Member State level. Legislation may be organised into a 'pyramid': on the bottom tier are those legal systems where cannabis is fundamentally considered as different from other drugs; at the top are those in which cannabis is treated on a par with all other drugs, but where prosecutorial instructions or even judicial discretion in practice apply a distinction between substances, usually based on criteria regarding the nature of the substance. Four general groups of countries can be identified in which cannabis is classified and controlled differently from other drugs, being thus subject to a different prosecutorial approach. These approaches are as follows: *classification by law; exemption to the law; exception by guidelines; or exception due to judicial discretion.*

Firstly, in certain countries, lists established in or directly linked to the laws are used to determine different legal degrees of severity in control and prosecution of offences. Cannabis is included in those lists that do not request the maximum legal response. For example, in Cyprus, the Netherlands and the United Kingdom, the respective laws classify cannabis in lists where the level of severity demanded in response to offences is not as strict as for substances included in other lists. Strikingly, no other substance listed in Schedule IV of the 1961 Convention has received this treatment.

Secondly, the law may consider drugs to be equally classified but provide specific *exemptions* for the prosecution of cannabis offences. In countries such as Ireland, Belgium and Luxembourg, cannabis is either legally classified amongst those substances presenting a serious risk of abuse, no medical value and subject to all control measures, or it is included in the general list of controlled substances which do not distinguish between such substances based on health risks. However, the national laws or penal codes introduce specific distinctions for cannabis possession that can render prosecution or sentencing for cannabis more lenient than for other drugs. In Greece, cannabis is classified on an equal footing to other drugs but production or cultivation of cannabis is legally distinguished from production or cultivation of other drugs for personal use. In Spain, classification of drugs is analogous to the UN Schedules, but there is a distinct lower penalty range for trafficking in drugs that are not considered as 'very dangerous substances', and jurisprudence shows this to be interpreted as cannabis. Less specifically, in Poland, while cannabis is classified in a way similar to the UN Conventions, the laws establish the category of a 'minor' drug possession offence, which may take into account the substance nature when determining if the offence qualifies as 'minor'. In practice, this may be attributed to first time personal use of cannabis.

A third variant is visible in those countries in which cannabis is legally classified in the most stringent lists and the law or penal code does not provide for any exemptions. However, *prosecutorial guidelines* or *judicial precedent* indicate that a distinction should be made based on the *nature* of the substance when prosecuting. In Denmark a State Prosecutor directive and in Germany a Constitutional Court decision request less severe measures for possession of cannabis for personal use.

In a separate group of countries (e.g. Czech Republic, Estonia), cannabis is not classified differently from other drugs and the law does not differentiate among substances, that is, drug offences attract the same penalty regardless of the substances involved. In this group there are no prosecutorial guidelines in favour of a less severe approach to cannabis. Nonetheless, the *nature* of the substance is one of the criteria (together with the quantity, previous criminal records, and other circumstances) considered by prosecutorial or judicial discretion when deciding to reduce the charges or not prosecute an offender. Cannabis may be included in this category as a ‘less dangerous’ drug.

The evidence available thus implies that, although international policy suggests that cannabis ought to be classified as one of the most dangerous substances to which the most severe controls apply, this is not often transposed as such across the different European national criminal justice systems. Nevertheless, the different interpretations of international conventions can be visible ‘*de jure*’ or ‘*de facto*’. They can be managed either by *legal classification*, or by specific mention in the *law or penal code*, or by *prosecutorial guidelines*, or by the *discretionary powers* proper to each judicial system. The choices between ‘*de jure*’ or ‘*de facto*’ options might reflect different political attitudes towards cannabis.

Personal use of cannabis ⁽²⁰⁾

Based on laws passed in parliament, ministerial directives or prosecutorial guidelines, a variegated picture emerges of the overall legal attitude towards personal use of cannabis. Nonetheless, despite the different legal approaches towards cannabis, a common trend can be seen in the development of alternative measures to criminal prosecution for cases of use and possession of small quantities of cannabis for personal use without aggravating circumstances. Fines, cautions, probation, exemption from punishment and counselling are favoured by most European justice systems. The EMCDDA maintains a table enabling comparison of legislation regarding cannabis offences on its website ⁽²¹⁾.

⁽²⁰⁾ ‘Personal use’ here applies to offences for simple use or possession exclusively for personal consumption, and where other finalities are excluded (although legal definitions vary, these usually involve small quantities and absence of aggravating circumstances).

⁽²¹⁾ See eldd.emcdda.europa.eu/index.cfm?fNodeID=5769

In the European countries considered for this chapter, personal use of cannabis attracts administrative sanctions ⁽²²⁾ or alternatives to custodial sanctions in 16 countries. This suggests that in many European countries considered, *personal use of cannabis* is an offence that attracts sanctions such as fines and deprivation of certain rights, for example suspension of driving licence, or other measures such as cautioning, discontinuance or suspension of proceedings or, if needed, referral to treatment, but does not lead to imprisonment. Indeed, drug policies in many European countries seem to concur that criminal action against non-problematic use/possession of cannabis should receive the lowest prosecutorial priority ⁽²³⁾.

Cannabis legislation: between global consistency and national leniency

In recent years cannabis or general drugs laws have been substantially modified in a number of European countries. In Portugal, drug use was decriminalised in 2000. In Luxembourg in 2001 penalties for cannabis use and possession passed from imprisonment to fines. In Belgium in 2003, following a similar approach, legislation was introduced that would attract a police registration and fine for the first two cannabis use prosecutions, although police registration was annulled by the ruling of the Belgian Court of Arbitration in 2004. The United Kingdom reclassified cannabis from a Class B to Class C drug in 2004. These are in line with the conclusions of the inquiries described above. The cannabis issue has been strongly debated in recent years in France, Switzerland, Italy and the Netherlands, fuelled by a number of legislative proposals. Some debate has embraced the legal status of cannabis used for therapeutic purposes. For example, in the Netherlands a project to supply cannabis to patients was established from 2003, with an Office of Medicinal Cannabis strongly regulating supply. However, demand has proven lower than expected (1 000–1 500 patients, or around one-tenth of predicted demand), although the policy was renewed for a 5-year period in November 2007.

Modification — or proposed modification of cannabis laws — have often been accompanied by heated debate in the media. The political sensitivity of moving away from strict control has caused governmental apprehension, and concern has also been manifested at the international level. The UN control system has taken a position on cannabis in several instances: the INCB has repeatedly raised objections to the way some EU countries deal with cannabis offences, in particular where personal use is

⁽²²⁾ 'Administrative sanctions' applies to sanctions not including imprisonment, such as fines or other non-criminal measures.

⁽²³⁾ EMCDDA (2002) *Prosecution of drug users in Europe*, p. 69, and Rand Europe (2003), *Cannabis policy, implementation and outcome*.

concerned. The Netherlands has often been criticised by the INCB for its ‘coffee shop’ policy, and also Luxembourg, Portugal and the United Kingdom have been the object of scrutiny for their new laws on cannabis, allegedly because of their non-alignment with international drug control treaties ⁽²⁴⁾. This message was again made clear in a chapter on ‘the new [high potency] cannabis’ in the UNODC’s 2006 *World Drugs Report*, which stated that ‘It is essential (...) that consensus be regained, and that what is truly a global issue is again approached with consistency on a global level. After all, it is for precisely this that the multilateral drug control system was designed.’

Such calls for awareness on the presumed cannabis leniency and the danger that such a ‘soft line’ on cannabis could provoke have not fallen on deaf ears. Without suggesting a direct link, some acknowledgement may be detected in the 2004 EU Council Resolution on cannabis, and increased scrutiny of cannabis in some EU countries. In Denmark, where since the 1970s people caught for possession of cannabis (for personal use) were just warned, a new directive of 2004 advises prosecutors that a fine should now be the norm. In the Netherlands, the government adopted an action plan to reduce the use of cannabis. In Italy, a country where since 1993 cannabis was officially considered to be different from other drugs, a 2006 law eliminated this difference on the assumption that all drugs are dangerous. In France, in 2005, a new campaign was launched on the risks of cannabis for young people after the government turned down the possibility of substituting penal sanctions with administrative fines for cannabis consumption, adducing that such a modification could have been interpreted as recognition of the ‘weak dangerousness’ of cannabis and could lead to an increase in consumption ⁽²⁵⁾.

To conclude, there is sufficient evidence to confirm that the legal approach to *personal* use of cannabis is far from homogeneous across the European countries. Nevertheless, avoiding imprisonment seems to be the trend for *personal use* offences, which can be applied more or less openly, through the law or through prosecution powers. However, there are some efforts to limit this trend. A rise in concern is visible at international and national level. An alleged increase of THC content (see King, this monograph) and increased demand for treatment with cannabis being the primary drug have contributed to this concern. The UN system openly condemns ‘lenient policies’ and recent policy shifts in some Member States suggest a renewed attention towards cannabis. Overall, it is interesting to note that while drug policies which appeared in the 1990s and early 2000s suggested a non-criminal approach to personal use of cannabis, more recent policies seem to tip the balance back towards more restrictive measures.

⁽²⁴⁾ See International Narcotics Control Board (INCB) Reports 1999, 2001 and 2002.

⁽²⁵⁾ *Plan gouvernemental de lutte contre les drogues illicites, le tabac et l’alcool 2004–2008*. Available at: www.drogues.gouv.fr

Bibliography

- Abel, E. L. (1980), *Marihuana: the first twelve thousand years*, Plenum Press, New York
www.druglibrary.org/Schaffer/hemp/history/first12000/abel.htm
- Arana, X., Márquez, I. (eds) (2006), *Cannabis: salud, legislación y políticas de intervención*, Colección Instituto Internacional de Sociología Jurídica de Oñate, first edition, Editorial Dykinson, Madrid.
- ARF/WHO (1981), ARF/WHO Scientific meeting on adverse health and behavioural consequences of cannabis use, WHO and the Addiction Research Foundation of Ontario, 1981; in WHO (1997), *Cannabis: a health perspective and research agenda*.
- Atance, R., Ruiz, F. (2000) 'Uso de los cannabinoides a través de la historia', in García, J. B., Calafat Far, A. (eds), *Monografía Cannabis*, Addiccionnes, Palma de Mallorca, 19–30.
- Australian Capital Territory (ACT) (1991), Legislative Assembly Select Committee on HIV, Illegal Drugs, and Prostitution, Australia.
- Bayer, I., Ghodse, H. (1999), 'Evolution of international drug control 1945–1995', in *Bulletin on Narcotics* 51 (1 and 2), United Nations, Vienna.
- Böllinger, L. (ed.) (1997), *Cannabis Science/Cannabis Wissenschaft*, Peter Lang Publishers
www.bisdro.uni-bremen.de/boellinger/cannabis/inhalt.htm
- Böllinger L. (2003), Evolution of Drug Policy in Germany, Lisbon International Symposium on Global Drug Policy, 24–25 October 2003.
- Böllinger, L., Stöver, H., Fietzek, L. (eds) (2002), *Drogenpraxis, Drogenrecht, Drogenpolitik: Ein Leitfaden für Drogenbenutzer, Eltern, Drogenberater, Ärzte und Juristen*, FHS Frankfurt.
- Bonnie, R. J., Whitebread, C. H. (1970), 'The forbidden fruit and the tree of knowledge: an inquiry into the legal history of American marijuana prohibition', *Virginia Law Review* 56 (6).
- Bonnie, R. J., Whitebread, C. H. (1974), *The marijuana conviction: a history of marihuana prohibition in the United States*, University Press of Virginia, Charlottesville.
- Booth, M. (2003), *Cannabis: a history*, Doubleday, London.
- Caballero, F., Bisiou, Y. (2000), *Droit de la drogue. 2e edition*, Dalloz, Paris.
- Canadian Government Commission of Inquiry (1970), *The Le Dain Commission Report: The Non-Medical Use of Drugs*, Information Canada, Ottawa.
- Commonwealth of Australia (1994), Legislative options for cannabis use in national drug strategy, Monograph 26.
- Council Framework Decision 2004/757/JHA of 25 October 2004 laying down minimum provisions on the constituent elements of criminal acts and penalties in the field of illicit drug trafficking. *Official Journal of the European Union* L 335, 11 November 2004, 8–11.
- Dorn, N., Jamieson, A. (2000), *Room for manoeuvre: overview of comparative legal research into national drug laws of France, Germany, Italy, Spain, the Netherlands and Sweden and their relation to three international drugs conventions*, Drugscope, London.
- EC Eurobarometer (2004), *Young people and drugs*, European Commission, Luxembourg.
- Economic and Social Council of the United Nations (1959) Resolution E/RES/1959/730(XXVIII)E on the question of cannabis: medical use of cannabis drugs, 1088th Plenary Meeting, 30 July 1959, United Nations, New York.
- Economic and Social Council of the United Nations (1968), Resolution E/RES/1968/1291(XLIV) on the abuse of cannabis and the continuing need for strict control, 1520th Plenary Meeting, 23 May 1968, United Nations, New York.
- EMCDDA (2001, updated 2006), *ELDD: Possession of cannabis for personal use*.
<http://eldd.emcdda.europa.eu/index.cfm?nNodeID=5769>
- EMCDDA (2002) *Prosecution of drug users in Europe — varying pathways to similar objectives*, European Monitoring Centre for Drugs and Drug Addiction, Lisbon.
- EMCDDA (2003) *Annual Report 2003: the state of the drugs problem in the European Union and Norway*, European Monitoring Centre for Drugs and Drug Addiction, Lisbon.

- EMCDDA (2005), *Thematic papers — illicit drug use in the EU: legislative approaches* www.emcdda.europa.eu/index.cfm?nnodeid=7082
- EMCDDA (2007) *Netherlands Reitox National Report 2006*, Trimbos Institute, Utrecht.
- Fischer, B. (1999), 'Prohibition, public health and a window of opportunity: an analysis of Canadian drug policy, 1985–1997', *Policy Studies* 20 (3): 197–210.
- Fischer, B., Single, E., Room, R., Poulin, C., Sawka, E., Thompson, H, Topp, J. (1998), 'Cannabis use in Canada: policy options for control', *Policy Options* October 1998, 35–38.
- Fischer, B., Room, R., Ala-Leppilampi, K., (2001), 'Control of cannabis use in western countries: a brief review of history and present, in European City Conference on cannabis policy' (Conference book), ES&E, The Hague, 37–42.
- French Government Commission d'enquête du Sénat Français (2003), *Rapport No. 321 de la Commission d'enquête su Sénat français sur la politique nationale de lutte contre les drogues illicites*, Sénat, Paris.
- Giffen, P. J., Endicott, S., Lambert, S. (1991), *Panic and indifference: the politics of Canada's drug laws*, Canadian Centre on Substance Abuse, Ottawa.
- Hamarneh, S. (1957), 'Pharmacy in medieval Islam and the history of drug addiction', *Medical History* 16: 226–237.
- Holzer, T. (2004), 'The history of global cannabis prohibition: a historical coincidence?', in *Global cannabis regulation model 2004*, Verein für Drogenpolitik, Mannheim.
- House of Lords Science and Technology Select Committee (1998), Ninth Report, *Cannabis: the scientific and medical evidence*, United Kingdom Parliament, London, HL 151, 1997–98.
- INCB (2001), *Annual report 2001*, International Narcotics Control Board, Vienna.
- Kendell, R. (2003), 'Cannabis condemned: the proscription of Indian hemp', in *Addiction* 98: 143–151.
- Lewin, L. (1924, edition published in 1998), *Phantastica*, Park Street Press, Rochester, Vermont.
- Linn Fischer, B., Room, R., Ala-Leppilampi, K. (2001), 'Control of cannabis use in western countries: a brief review of history and present', in European City Conference on cannabis policy (Conference book), ES&E, The Hague, 37–42
- Lowes, P. D. (1966), *The genesis of international narcotics control*, Librairie Droz, Geneva.
- Mayor's Committee on Marijuana (1944), *The La Guardia Committee Report: The Marijuana Problem in the City of New York: Sociological, Medical, Psychological, and Pharmacological Studies*, Jacques Cattell Press, Lancaster, PA.
- Musto, D. F. (1973) *The American disease: origins of narcotic control*, Yale University Press, New Haven and London.
- National Commission on Ganja (2001), *A Report of the National Commission on Ganja to Rt Hon. P. J. Patterson QC, MP, Prime Minister of Jamaica*, prepared by Professor Barry Chevannes, Chairman, Reverend Dr Webster Edwards, Mr Anthony Freckleton Ms Norma Linton QC, Mr DiMario McDowell, Dr Aileen Standard-Goldson, Mrs Barbara Smith www.rism.org
- The Netherlands Baan Commission (1972), *Werkgroep Verdovende Middelen, background and risks of drug use*, The Haque: Staatsuitgeverij.
- New South Wales Joint Parliamentary Committee upon Drugs (1978), *Report into Drug Abuses*, Sydney.
- Panama Canal Zone Report* (1925), Canal Zone Committee, The Panama Canal Zone Military Investigations.
- Report of the Health Committee (Steve Chadwick, Chairperson) (August 2003) *Inquiry into the public health strategies related to cannabis use and the most appropriate legal status*, 47th Parliament, House of Representatives, New Zealand.

- Report of the Senate Special Committee on Illegal Drugs, Chairman: Pierre Claude Nolin, Deputy Chairman: Colin Kenny (September 2002), 'Cannabis: our position for a Canadian public policy', Senate, Canada.
- Rosenthal, F. (1971), *The herb: hashish versus medieval muslim society*, E. J. Brill, Leiden.
- Senate Standing Committee on Social Welfare (1977), *Drug problems in Australia — an intoxicated society?*, Australian Commonwealth Government Printing Office, Canberra.
- South Australian Royal Commission into the Non-Medical Use of Drugs (1979), *Royal Commission into the non-medical use of drugs: South Australia, final report*, Adelaide.
- Swedish National Drugs Policy Coordinator (2003), *Is cannabis a harmless drug? Connecting research to drug control policy*, Stockholm
www.mobilisera.nu/upload/dok_cannabis.pdf
- Swiss Federal Commission For Drug Issues (EKDF) (1999), *Drug issues: cannabis report*, Federal Office of Public Health, Bern.
- UK Home Office (1969), *Cannabis: Report by the Advisory Committee on Drug Dependence* (The 'Wootton Report'), Home Office, London.
- UK Home Office (2002), *Report by the Advisory Committee on Drug Dependence: the classification of cannabis under the Misuse of Drugs Act 1971*, Home Office, London
www.drugs.gov.uk/publication-search/acmd/cannabis-class-misuse-drugs-act
- UK Home Office (2005), *The Advisory Council's Report — further consideration of the classification of cannabis under the Misuse of Drugs Act 1971*
www.drugs.gov.uk/publication-search/acmd/cannabis-reclass-2005
- United Nations (1961), *Single convention on narcotic drugs, 1961, as amended by the 1972 protocol amending the single convention on narcotic drugs, 1961*, United Nations, New York.
- United Nations (1971), *Convention on psychotropic substances 1971*, United Nations, New York.
- United Nations (1973), *Commentary on the single convention on narcotic drugs, 1961*, United Nations, New York.
- United Nations (1988), *Convention against the illicit traffic in narcotic drugs and psychotropic substances 1988*, United Nations, New York.
- United Nations Commission on Narcotic Drugs (1957), *Resolution IV(XII) on the question of cannabis, May 1957*, United Nations, Vienna.
- United Nations Commission on Narcotic Drugs (2003a), *Ministerial-level segment of the session of the commission on narcotic drugs*, UNODC Executive Director Speech, United Nations, Vienna.
- United Nations Commission on Narcotic Drugs (2003b), *Report on the forty-sixth session* (15 March 2002 and 8–17 April and 26–27 November 2003) E/CN.7/2003/19, Official Records, Supplement No. 8, United Nations, Vienna.
- The UN Documents of the Years Preceding the Signatures of the 1961 and 1971 Conventions CND Decision Dec. 14 (XIV) April/May 1959 CND (1959) decision 14 (XIV) 1959 to request all governments concerned to increase their efforts to suppress the illicit cultivation of cannabis, United Nations, New York.
- US National Commission on Marihuana and Drug Abuse (Raymond P. Shafer, Chairman) (1973), *Marihuana: a signal of misunderstanding*, US Government Printing Office, Washington
www.druglibrary.org/schaffer/Library/studies/nc/ncmenu.htm
- van het Loo, M., Hoorens, S., van't Hof, C., Kahan, J. (2003), *Cannabis policy, implementation and outcomes*, RAND Europe
www.rand.org/pubs/monograph_reports/MR1805/
- World Health Organisation (WHO) (1997), *Division of Mental Health and Prevention of Substance Abuse, Cannabis: a health perspective and research agenda*, WHO, Geneva
http://whqlibdoc.who.int/hq/1997/WHO_MSA_PSA_97.4.pdf

World Health Organisation (WHO) (2002), *Expert Committee on Drug Dependence, thirty-third report*, WHO, Geneva

http://whqlibdoc.who.int/trs/WHO_TRS_915.pdf

World Health Organisation (WHO) (2006), *Expert Committee on Drug Dependence, thirty-fourth report*, WHO, Geneva

www.who.int/medicines/areas/quality_safety/WHO_TRS_942.pdf

Zimmer, L., Morgan J. (1997), *Marijuana myths, marijuana facts, a review of the scientific evidence*, Lindesmith Center, New York.

Chapter 8

In thinking about cannabis policy, what can be learned from alcohol and tobacco?

Keywords: alcohol – cannabis – economics – environmental strategy – polydrug consumption – prohibition – regulation – taxation – tobacco

Setting the context

Cannabis is just one of many psychoactive substances used in Europe for recreational and therapeutic purposes. Research into the topic has never really ignored this real-life polydrug use. Most joints contain tobacco. A cannabis session often includes the consumption of alcoholic drinks. These are givens. Nonetheless, only recently have professionals working in the area of cannabis control genuinely begun to look at the ‘cross-substance’ effects of legislation targeted at other, legal, substances such as alcohol and tobacco.

This is not to say that there has been a revolutionary shift towards examining the interrelationships of polydrug consumption. The epidemiological regime — which splits drug taking along neat substance-specific lines (cannabis, ecstasy, cocaine, etc.) — remains in place. Rather, there has been a shift in national drug strategies — at least in Europe — to erode the *substance-specific approach* which traditionally segregated activity on licit psychoactive substances from activity on illicit drugs ⁽¹⁾. Politically, it is no longer taboo to compare legal and illegal substances. The recent advent of smoking bans in Europe represents a golden opportunity to measure the knock-on effects on consumption of other substances. Moreover, evidence on the effects of decriminalisation of cannabis (that is, lower penalties for personal possession) in many European countries during the early 2000s is now filtering into the policy literature.

This chapter does not retread the well-worn track of comparative drug harm indexes and the relative harms of cannabis and society’s chosen licit drugs. Instead, it examines the

⁽¹⁾ EMCDDA *Annual Report 2006*, selected issue: ‘European drug policies: extended beyond illicit drugs?’.

ways in which the market for licit substances has been subject to government control, together with brief commentary on the merits of these interventions. The ‘elephant in the room’ has been dutifully ignored. There are no ‘what-if’ scenarios on how market controls could be transposed to cannabis in a post-legalisation environment. A postscript to this chapter provides a range of sources for further reading on the topic of mooted cannabis regulation. However, for the time being, any such options would require a huge shift in the political balance, which currently appears to be, if anything, more tipped in the favour of increased controls on cannabis rather than liberalisation (see Ballota et al., this monograph).

Further reading on the regulation of alcohol and tobacco

Alcohol

- Anderson, P., Baumberg, B. (2006), *Alcohol in Europe*, Institute of Alcohol Studies, London ec.europa.eu/health-eu/news_alcoholineurope_en.htm
- Gerritsen, H. (2000), *The control of fuddle and flash: a sociological history of the regulation of alcohol and opiates*, Brill Academic Publishers, Leiden.
- Walton, S. (2003), *Out of it: a cultural history of intoxication*, Random House, New York.

Tobacco

- European Commission (2007), *Green paper — towards a Europe free from tobacco smoke: policy options at EU level*, Health & Consumer Protection Directorate-General.
- Kopp, P., Fenoglio, P. (2000), ‘Le coût social des drogues licites (alcool et tabac)’, in *Observatoire Français des Drogues et Toxicomanies* 22.

In thinking about cannabis policy, what can be learned from alcohol and tobacco?(²)

Robin Room

If caffeine and other such banalised psychoactive substances are left out of consideration, almost everywhere in Europe today cannabis is one of the ‘big three’ of psychoactive substances, along with alcohol and tobacco. Although the international drug control system applies continuing pressure against it, cannabis has taken on a semi-legal status in many parts of Europe, at least at the level of the user.

This raises the question, what can be learned from the extensive literatures on alcohol and tobacco policy which might be useful in thinking about cannabis policy? The question is obviously applicable in a situation where cannabis has a legal or semi-legal status. It also has some applicability where cannabis has a clearly illegal status. Total prohibition was once fairly common in both the tobacco (Austin, 1978) and alcohol fields, in the case of alcohol applying less than a century ago in many parts of Europe — Norway, Finland, Iceland, the Russian Empire and then the early Soviet Union. Studies of what happened during alcohol prohibition, and also of what happened with legalisation, are of interest in thinking about cannabis policy.

Taking into account the alcohol and tobacco experience is particularly important because the field of empirical studies of cannabis policy is so little developed. A landmark in this field is the sustained effort by MacCoun and Reuter (2001) to assemble the evidence on the likely results of illicit drug legalisation in the USA. A byproduct of this study, however, was an underlining of how weak the evidence base is in this area. A recent review of ‘the contribution of economics to an evidence-based drugs policy’ (MacDonald, 2004) found agreement that illicit drug use showed some responsiveness to price, but that ‘there is not yet a consensus on the possible range of price elasticities for certain drugs’. Evidence on the effects of depenalisation of marijuana still depends on a rather small range of studies (Single, 1989; MacCoun and Reuter, 2001; Donnelly et al., 2000), in some cases of paradoxical instances where the reach of the criminal law actually widened (Single et al., 2000).

(²) This paper draws in part on Room (2005).

Traditions of studying the impact of alcohol and tobacco policies

Alcohol policy impact studies

There is a very substantial literature on the effects of alcohol control policy changes on drinking amounts, patterns and problems. Data used in these analyses has primarily been of two types: social and health statistics, such as alcohol sales data, police statistics and mortality and hospital discharge data; and before-and-after surveys, mostly cross-sectional but in a few cases longitudinal. Some studies have included control sites, and one or two notable studies have included a random assignment to intervention or control condition (e.g. Norström and Skog, 2003).

Alcohol policy impact studies have primarily been carried out in a limited range of countries, generally excluding both the developing world (Room et al., 2002) and Southern European wine cultures. Even between somewhat similar societies, there are substantial variations in the research emphasis on particular topics (Room, 2004).

There is an imperfect fit between what those involved in liquor licensing decisions may want to know and what is available in the literature on alcohol controls. This gap between the content of alcohol control legislation and the research literature has been documented in the USA (Wagenaar and Toomey, 2000), but exists also elsewhere — particularly in countries where the tradition of alcohol policy impact studies has not been strong. The studies are sometimes done because a change was controversial in a particular jurisdiction, and funding an evaluation was a way of defusing the controversy. Other studies have been opportunistic, where a researcher seizes the chance to do a ‘natural experiment’ study (‘natural’ here means that the researcher did not have a voice in the circumstances of the change, so that the study’s design is often constrained). Often studies have made use of available data, such as per-capita consumption data or mortality registers. Since research is usually a national government responsibility, its topical focus is not necessarily attuned to the concerns of local jurisdictions.

Nevertheless, the growth of the literature evaluating the effects of alcohol controls has been a substantial achievement involving a number of national traditions, and lessons from it can be applied, with suitable caution, across jurisdictions, and drawn on in thinking about cannabis policy. Reviews are now available (e.g. Babor et al., 2003; Room et al., 2002) which summarise the findings and implications of the literature. A new step forward, as part of the WHO-CHOICE programme (‘Choosing interventions which are cost effective’, available at: www3.who.int/whosis/menu.cfm?path=evidence,cea&language=english), has been the estimation of the relative cost-effectiveness of different strategies and combinations of strategies to prevent alcohol-related problems (Chisholm et al., 2004), in terms of dollars per saved DALY (disability-adjusted life

Table 1: Comparative cost-effectiveness of alcohol interventions in 'Europe-A' (Chisholm et al., 2004)

	DALYs saved/million population	Average cost-effectiveness ratio (\$/DALY)
Brief medical advice	1 889	2 351
Tax: current + 50 %	1 764	258
Tax: current + 25 %	1 576	289
Tax: current	1 365	333
Advertising ban	459	594
Saturday closing for off-sales	251	1 087
Random traffic breath tests	247	2 467

year). Table 1 shows some of the results from these analyses for the 'Europe-A' WHO subregion, which is roughly coextensive with the European Union. Since evidence was lacking for any effectiveness of mass media persuasion of school-based education, these strategies were excluded from the analysis as having no apparent cost-effectiveness. In terms of cost-effectiveness per DALY saved in developed European countries, then, the policies tested ranked as follows (most cost-effective first): taxes (even without counting the revenues from taxes); advertising ban; closing times (specifically, Saturday closing for off-sales); random traffic breath tests; screening and brief medical advice; and (with no cost-effectiveness) mass media persuasion and school education.

Tobacco policy impact studies

There is also a substantial literature of tobacco policy impact studies. As for alcohol, there are several synthetic reviews of the literature (e.g. Jha and Chaloupka, 1999; Rabin and Sugarman, 2001). Whereas the alcohol policy impact literature aims primarily at assessing the impact of specific interventions, the equivalent tobacco literature is often aimed at assessing the impact of anti-smoking policy packages as a whole (e.g. Siegel and Biener, 1997; Pierce et al., 1998). This partly reflects the reality that policy changes in the tobacco area have often involved the simultaneous application of multiple strategies. It also reflects the different circumstances of the substances in the countries where the main policy impact studies have been done. For alcohol the status quo ante has often been a detailed system of controls on availability and on places and times of use, with the literature often studying what happens when one or more of the controls is removed or relaxed. For tobacco the status quo ante has been very little control on availability, and the literature is primarily studying the effect of initiating measures such as anti-smoking persuasion campaigns, controls on places of use and on age of purchase, and raised prices, which have been increasingly put forward as a coordinated package.

Comparing the alcohol policy and tobacco control literatures, one can find clear differences in emphasis. Taxes loom even larger as a strategy for tobacco than they do for alcohol (see Chaloupka et al., 2001). Although a much greater proportion of the total harms from alcohol than from tobacco are to others, the aim of reducing harm from 'second-hand smoke' has proved politically potent for tobacco control in a way that has only been true for drink-driving in alcohol policy. Accordingly, a strong emphasis in the tobacco literature has been put on environmental prohibitions — bans on smoking at work and in public places — which are already, to a considerable degree, taken for granted with respect to alcohol.

In this connection, Hauge (1999) has argued that the modern emphasis on health harm to the drinker has been a policy mistake in the alcohol field. The two policy impact literatures have also reached substantially different conclusions about the effects of counter-advertising campaigns. This probably primarily reflects the differences in the aims and content of the campaigns, as well as differences in the social politics of the substances. The anti-smoking campaigns which have proved effective (Pechman and Reibling, 2000; Sly et al., 2001, 2002; Wakefield et al., 2003) have often involved frontal attacks financed by governmental agencies on the bona fides of the tobacco industry. This is an unusual enough occurrence in a capitalist society to have impressed teenagers, at least in the short run — although the campaigns have often proved politically unsustainable in the longer run (Givel and Glantz, 2000). Also, more available in the nicotine field, though underutilised, has been the option of harm reduction through changing the mode of use of the psychoactive substance (Shiffman et al., 1997).

As for alcohol, the WHO-CHOICE programme has calculated estimated cost-effectiveness ratios for specific interventions, and for combinations of interventions (Shibuya et al., 2003). Results for 'Europe-A' are shown in Table 2. Again, the cost-effectiveness calculations exclude the government revenue gained from the tax from the calculations. A comparison of the results suggests that somewhat more conservative assumptions were used in the alcohol calculations than in the tobacco calculations.

Instead of impact studies: 'expert knowledge'

As will be apparent from the discussion above, there is great variability in the availability of published evidence on the effects of policies governing the availability and use of psychoactive substances, both licit and illicit. It should be noted, however, that the lack of a formal academic literature does not mean a lack of practical knowledge of the effects of policies. As Valverde (2003) has documented for the alcohol control system in Ontario, those staffing regulatory systems typically build up a job-based stock of knowledge, often mixing 'facts' and values, which guide their everyday actions. On the other hand, there is ample experience from medicine and other professions with

Table 2: Comparative cost-effectiveness of tobacco interventions in 'Europe-A' (Shibuya et al., 2003)

	Total DALYs saved (millions/year)	Average cost-effectiveness ratio (\$/DALY)
Doubling the highest tax	6.9	13
Highest regional tax rate (75%)	4.8	18
Global average tax rate (44%)	2.0	44
Enforced bans on smoking in indoor public space	0.8	358
Counter-advertising campaigns	0.7	337
Nicotine replacement	0.7	2164
Comprehensive advertising ban	0.6	189

such practice knowledge that its conclusions about effects are often mistaken, when subjected to the harsh test of well-designed outcome and impact studies. It would be advantageous, with respect to cannabis policy, and for that matter policy on all psychoactive substances, to move to an 'evidence-based' standard of policymaking. This requires a substantial investment in developing the evidence on which the policymaking can be based.

Some specific lessons from alcohol and tobacco policy research

Does consumption necessarily go up after legalisation?

The answer to this question seems to be, 'it depends'. The total alcohol consumption does not seem to have changed much after the legalisation of alcohol at the end of US Prohibition (Gerstein, 1981). But this was in a circumstance of economic depression, and with quite stringent alcohol control regimes replacing prohibition in many US states. As MacCoun and Reuter (2001 pp. 356–366) conclude, in the US context, depenalisation of use seems not to increase cannabis use, but outright legalisation probably would. However, the circumstances of legalisation would certainly affect this, and stringent regulatory control of cannabis would be likely to hold consumption down (see below).

What regulatory alternatives are there to prohibition?

The history of control of alcohol and other psychoactive substances is full of examples of different regulatory regimes, and the effects of some of them have been evaluated. One part of such a system is the regulation of the market in the substance, including retail sales.

One option for such regulation is a kind of *prescription or permit system*, issuing licences to individuals to purchase cannabis. This could be a system organised with physicians and pharmacists as the gatekeepers, like prescription systems for psychoactive medications. Such a system, with a mental health screening component, might be adopted if there is a major policy concern about cannabis precipitating schizophrenia. But it seems more likely that a more bureaucratised system, as for driver's licences, would be adopted. Sweden's 'Bratt system' for alcohol in the decades before 1955 had a version of such individualised controls (Frånberg, 1987).

A second option is a *rationing system*, which allots a maximum purchase amount to the purchaser in a particular time period. The Swedish Bratt system included a rationing system, and there are also some more recent examples of alcohol rationing (Schechter, 1986).

A third option is a *government monopoly system*, where the state monopolises one or more levels of the production, distribution and sale of the substance. Such monopoly systems presently exist for alcohol in 18 US states and all Canadian provinces (though only a few of the states and nine of the provinces have monopoly stores at the retail level), as well as in all Nordic countries, except Denmark. There have been state monopoly systems for cannabis in India, and monopoly systems for opiates were a feature in the Asian territories of the empires of the first half of the 20th century (Brook and Wakabayashi, 2000). The medicinal cannabis office set up by the Dutch government may be seen as a similar monopoly. There is a recent Canadian proposal for government shops to take over the sale of tobacco (Callard et al., 2005), and there have also been proposals in Canada and in the US northwest for cannabis to be legalised for sale in government alcohol stores.

The fourth option is a *licensing system*, where private commercial enterprises are licensed to sell the product, with the licence conditional on the seller abiding by the rules of a regulatory system. Such a system is common for alcoholic beverages, as an alternative to a government monopoly. A licensing system is used in the Netherlands to regulate the 'coffee shops' that allow non-criminalised retail purchase of cannabis (see Korf, this monograph). Specific licensing systems for retail tobacco sales have become common, for instance, in the USA in recent years (www.healthpolicycoach.org/doc.asp?id=3147).

Is a rationing system effective?

There is good evidence that rationing systems for alcohol hold down the levels of problems from alcohol, whether in terms of violence (Schechter, 1986) or long-term

health consequences (Norström, 1987). When the Swedish system of individualised rationing was abolished in 1955, for instance, the rate of liver cirrhosis mortality jumped by one-third in the following year, reflecting the removal of a constraint on the consumption of heavy drinkers (Norström, 1987).

Is a government monopoly system effective?

It has been shown that government monopoly of retail sales can be quite effective in holding down retail sales of alcoholic beverages (Her et al., 1999). The effects are partly through associated characteristics which have been shown to be effective in holding down sales: limitation of the number of sales outlets, and limitation of hours and days of sale. Government management of the system also results in more professionalised employees, less likely, for instance, to sell to those who are under legal age. And it removes the private profit motive, which tends to drive consumption upwards, not only in terms of sales promotion but also in terms of political influence from private actors to loosen restrictions in availability (Room, 2001).

Do taxes on psychoactive substances affect the amount of consumption?

As already indicated in Table 2, the answer to this from both the tobacco and the alcohol literature is an emphatic 'yes'.

Can regulatory policies affect the potency of the psychoactive substance used?

The answer to this question is clearly 'yes'. At least a dozen US states, for instance, ban Everclear spirits, a product that is 95% pure ethanol. The legal availability of lesser-strength alcoholic beverages (including regular-strength spirits) means that there is no substantial black market for Everclear.

Prior to 1915, spirits were the main form of alcohol consumed in all Nordic countries. By the 1980s, the main form was beer (wine has now replaced beer in Sweden as the most used form in terms of alcohol content). The changeover from spirits to beer was accomplished very quickly in Denmark by a swingeing tax on spirits imposed during the First World War (Bruun et al., 1975). In other Nordic countries the change was more gradual, accomplished partly by differential taxation and partly by making low- and middle-strength beer more widely available than other alcoholic beverages.

Whether a more potent form of the psychoactive substance is more harmful than a less potent form is an apparently easy question to answer for alcohol, in the sense that most of the harm from drinking alcohol comes from the psychoactive ingredient itself. Nevertheless, it can be questioned how much effect the Nordic political effort to channel consumption toward beer and wine and away from spirits had on alcohol-related problems. The political intent was to moderate drinking customs along with the change in beverage, but there is little evidence that this happened. At least in the short run, the 'trouble per litre' of alcohol did not decline when beer was made much more available in Finland in 1969, and consumption rose by about 50% (Mäkelä et al., 1981).

For tobacco, as for cannabis, the issue of whether greater potency is more harmful is obviously more complicated, since much of the harm results not from the psychoactive ingredient but from what accompanies it, particularly in smoked form (tars, carbon monoxide). Thus, low-nicotine, high-tar tobacco cigarettes are likely to cause more health harm than high-nicotine cigarettes, since the smoker will get more tar and carbon monoxide in the course of reaching the same level of nicotine. Analogously, it should not be assumed that a higher THC content will be more harmful.

Interacting with the issue of potency is the issue of mode of ingestion. It is likely that there is less risk to health from eating or vapourising marijuana than from smoking it. However, for licit as well as illicit psychoactive substances, there is relatively little systematic knowledge on the effects in a population of measures designed to favour one mode of ingestion over another. Often policies are made on the basis of vague fears rather than systematic knowledge. For instance, the Swedish form of snuff, known as *snus*, is banned for sale in the European Union, other than in Sweden, on the grounds that it is a health hazard. There are good public health arguments for promoting the use of *snus* as a much less harmful alternative to smoking cigarettes, although these arguments are also disputed (Gilljam and Rosaria Galanti, 2003). But at present the European legal system considers that it must make decisions on whether *snus* should remain banned on the basis of suppositions.

Snus is much less deadly than smoked tobacco ... [But] one cannot conclude with certainty whether offering *snus* on the market would principally have the effect of encouraging smokers to stop smoking (a 'substitution effect') or of facilitating, on the contrary, the path towards consumption of tobacco (a 'passage-way effect') ... The insufficiency of data and the scientific uncertainty [is about] the supposed behaviour of the public. The question which poses itself is that of knowing if, in these circumstances, the ban on *snus* can be considered as a protective measure efficacious for public health.

(Geelhoed, 2004; translated from French version)

Can regulatory policies affect the location and circumstances of use?

Again, the answer to this is clearly positive. One result of prohibitory policies is to push consumption into private or semi-private places. The Dutch coffee shop model of limited cannabis availability in designated places may be seen as holding down the public nuisance from cannabis smoking (see Korf, this monograph).

Again, however, the issue of which locations of use are more harmful has turned out to be complicated in the alcohol field. Drinking in streets and parks is usually seen as increasing the nuisance for others (Törrönen, 2003), but the perception has varied at different times on whether drinking in a tavern or restaurant is more or less harmful than drinking at home. On the one hand, control laws in US states at repeal of prohibition often forbid sale of 'liquor by the drink', since at that time the 'old-time saloon' was defined as the seat of most alcohol problems. But when 'liquor by the drink' was finally allowed in North Carolina, no effect on alcohol-related harm statistics could be detected (Blöse and Holder, 1987). On the other hand, Finnish authorities in the 1970s presumed that drinking in a bar or restaurant would be more restrained than drinking at home. But in fact, Partanen (1975) found that the empirical results in Helsinki were the opposite: 'people do not drink any more at home than in a restaurant, but they do it in a more leisurely manner, which seems to lead to a lower degree of intoxication'. The issue of the harm associated with specific circumstances of use should be treated as an empirical question rather than a matter of 'expert knowledge'.

What about the impact of the European single market and of trade agreements and disputes?

The prohibition on cannabis sales under the international drug control regime is presumably primarily responsible for the fact that there have been so far no challenges to any legislation that discriminates, for instance, between cannabis grown in the country and imported cannabis. Such challenges have been a regular occurrence for both tobacco and alcohol, and both the single market mechanisms of the European Union and the trade agreements administered by the World Trade Organisation have created substantial difficulties for alcohol and tobacco control regimes (e.g., Room and West, 1998; Taylor et al., 2000). The new Framework Convention on Tobacco Control may help to remedy this situation, but the issue of whether it overrides trade agreements is not settled (Room, 2006). It would thus be wise for any move to legalise cannabis, however restrictive the regulations, to take into account the need to exempt hazardous substances from coverage under trade agreements and disputes.

Conclusion

Although the literatures have their limits, studies of the impact of tobacco and alcohol policies are much more numerous and cover a broader territory than the equivalent studies for cannabis. In the absence of formal studies, estimation of the impact of laws and policies remains a matter for 'expert knowledge', although it is clear from the alcohol and tobacco fields, as well as from medical and other research, that expert knowledge based only on general principles or practical experience is often wrong. Any government that is serious about making laws and policy that have specific intended effects needs to build funding into any policy initiative for a scientific evaluation of its actual effects, both intended and otherwise.

The alcohol and tobacco research findings suggest some general conclusions about the relative strength of different prevention and policy strategies. As with cannabis, it is difficult to show lasting effects from public information campaigns and school education on tobacco and alcohol. On the other hand, laws which channel rather than forbid use — for instance, laws against drink-driving — have been shown to be effective. In general, the findings in both the alcohol and the tobacco literatures underline the power of regulatory approaches, including taxation, in limiting the harm from psychoactive substances. Such regulations are more easily and effectively applied where there is a legal market, since in that case there are licensed actors in the market who have something to lose by having their licences suspended or taken away. From this perspective, the state ties one hand behind its back with a prohibition regime, since its ability to control the market is greatly restricted.

On the other hand, it must be acknowledged that Europe has serious health and social problems from both tobacco and alcohol. In both areas, the European Union is now taking some steps to assist national and local governments in reducing the levels of problems. But a clear difficulty in this effort, both at EU and national levels, is the entrenched political power of vested economic interests in maintaining the size of the alcohol and tobacco markets. Any shift towards regulatory regimes for cannabis would be wise to take account of this, and to build into cannabis policies insulation from the potential influence of market forces and interests.

References

- Austin, G. (1978), *Perspectives on the history of psychoactive substance use*. NIDA Research Issues 24, US National Institute on Drug Abuse, Rockville, MD.
- Babor, T., Caetano, R., Casswell, S., Edwards, G., Giesbrecht, N., Graham, K., Grube, J., Gruenewald, P., Hill, L., Holder, H., Homel, R., Österberg, E., Rehm, J., Room, R., Rossow, I. (2003), *Alcohol: no ordinary commodity – research and public policy*. Oxford University Press, Oxford.
- Blose, J. O., Holder, H. D. (1987), Liquor-by-the-drink and alcohol-related traffic crashes: a natural experiment using time-series analysis. *Journal of Studies on Alcohol* 48: 52–60.

- Brook, T., Wakabayashi, B. T. (eds) (2000), *Opium regimes: China, Britain, and Japan 1839–1952*, University of California Press, Berkeley.
- Bruun, K., Edwards, G., Lumio, L., Mäkelä, K., Pan, L., Popham, R. E., Room, R., Schmidt, W., Skog, O.-J., Sulkunen, P., Österberg, E. (1975), *Alcohol control policies in public health perspective* 25, The Finnish Foundation for Alcohol Studies, Helsinki.
- Callard, C., Thompson, D., Collishaw, N. (2005), *Curing the addiction to profits: a supply-side approach to phasing out tobacco*. Canadian Centre for Policy Alternatives and Physicians for a Smoke-Free Canada, Ottawa.
- Chaloupka, F. J., Wakefield, M., Czart, C. (2001), 'Taxing tobacco: the impact of tobacco taxes on cigarette smoking and other tobacco use', 39–71 in Rabin, R. L., Sugarman, S. D. (eds), *Regulating tobacco*, Oxford University Press, Oxford, 39–71.
- Chisholm, D., Rehm, J., van Ommeren, M., Monteiro, M., Frick, U. (2004), The comparative cost-effectiveness of interventions for reducing the burden of heavy alcohol use. *Journal of Studies on Alcohol* 65: 782–793.
- Christie, P., Ali, R. (2000), 'Offences under the cannabis expiation notice scheme in South Australia', *Drug and Alcohol Review* 19: 251–256.
- Connolly, J. (2005), *The illicit drug market in Ireland: overview no. 2*, Health Research Board, Dublin.
- Costes, J.-M. (ed.) (2007), *Cannabis: données essentielles*, OFDT, Paris.
- Donnelly, N., Hall, W., Christie, P. (2000) 'The effects of the cannabis expiation notice system on the prevalence of cannabis use in South Australia: evidence from the National Drug Strategy Household Surveys 1985–95', *Drug and Alcohol Review* 19: 265–269.
- Frånberg, P. (1987), 'The Swedish Snaps — A History of Booze, Bratt, and Bureaucracy — a summary', *Contemporary Drug Problems* 14: 557–611.
- Geelhoed, M. L. A. (2004), Conclusions de l'avocat générale M.L.A. Geelhoed [on cases C-434/02 and C-210/03]. Luxembourg: Court of Justice of the European Communities, 7 September <http://curia.eu.int/jurisp/cgi-bin/form.pl?lang=en&Submit=Submit&docrequire=alldocs&numaff=C-210%2F03&datefs=&datefe=&nomusuel=&domaine=&mots=&resmax=100>
- Gerstein, D. (1981), 'Alcohol use and consequences', in Moore, M., Gerstein, D. (eds), *Alcohol and public policy: beyond the shadow of prohibition*, National Academy Press, Washington DC, 182–224.
- Gilljam, H., Rosaria Galanti, M. (2003), 'Role of snus (oral moist snuff) in smoking cessation and smoking reduction in Sweden. With other papers and commentaries', *Addiction* 98: 1183–1207.
- Givel, M. S., Glantz, S. A. (2000), 'Failure to defend a successful state tobacco control program: policy lessons from Florida', *American Journal of Public Health* 90: 762–767.
- Hauge, R. (1999) 'The public health perspective and the transformation of Norwegian alcohol policy', *Contemporary Drug Problems* 26: 193–207.
- Her, M., Giesbrecht, N., Room, R., Rehm, J. (1999) 'Privatizing alcohol sales and alcohol consumption: evidence and implications', *Addiction* 94: 1125–1139.
- Jha, P., Chaloupka, F. J. (1999), *Curbing the epidemic: governments and the economics of tobacco control*, World Bank, Washington DC <http://www1.worldbank.org/tobacco/reports.asp>
- MacCoun, R., Reuter, P. (2001), *Drug war heresies: learning from other vices, times and places*, Cambridge University Press, Cambridge.
- MacDonald, Z. (2004), 'What price drug use? The contribution of economics to an evidence-based drugs policy', *Journal of Economic Surveys* 18: 113–152.
- Mäkelä, K., Österberg, E., Sulkunen, P. (1981), 'Drink in Finland: increasing alcohol availability in a monopoly state', in Single, E., Morgan, P., de Lint, J. (eds), *Alcohol, society, and the state: 2. The social history of control policy in seven countries*, Addiction Research Foundation, Toronto, 31–60.

- Norström, T. (1987), 'Abolition of the Swedish alcohol rationing system: effects on consumption distribution and cirrhosis mortality', *British Journal of Addiction* 82: 633–641.
- Norström, T., Skog, O.-J. (2003), 'Saturday opening of alcohol retail shops in Sweden: an impact analysis', *Journal of Studies on Alcohol* 64: 393–401.
- Partanen, J. (1975), 'On the role of situational factors in alcohol research: drinking in restaurants vs. drinking at home', *Drinking & Drug Practices Surveyor* 10: 14–16.
- Pechman, C., Reibling, E. T. (2000), Anti-smoking advertising campaigns targeting youth: case studies from USA and Canada. *Tobacco Control* 9 (Suppl. II): 18–31.
- Pierce, J. P., Gilpin, E. A., Emery, S. L., White, M. M., Rosbrook, B., Berry, C. C. (1998), 'Has the California tobacco control program reduced smoking?', *Journal of the American Medical Association* 280: 893–899.
- Pudney, S. et al. (2006), 'Estimating the size of the UK illicit drug market', in Singleton et al. (eds), *Measuring different aspects of problem drug use: methodological developments*, Home Office Online Report 16/06, London.
- Rabin, R. L., Sugarman, S. D. (eds) (2001), *Regulating tobacco*, Oxford University Press, Oxford.
- Room, R. (2001), 'Why have a retail alcohol monopoly?' Paper presented at an International Seminar on Alcohol Retail Monopolies, Harrisburg, Pennsylvania, 19–21 August www.bks.no/retail.htm
- Room, R. (2004), 'Effects of alcohol controls: Nordic research traditions', *Drug and Alcohol Review* 23: 43–53.
- Room, R. (2005), 'Social policy and psychoactive substances: a review', Report to the Foresight Brain Science, Addiction and Drugs Project, Foresight Directorate, Office of Science and Technology, London www.foresight.gov.uk/Previous_Projects/Brain_Science_Addiction_and_Drugs/Reports_and_Publications/ScienceReviews/Social%20Policy.pdf
- Room, R. (2006), *International control of alcohol: alternative paths forward*. *Drug Alcohol Rev.* 25: 581–595.
- Room, R., West, P. (1998), 'Alcohol and the U.S.-Canada border: trade disputes and border traffic problems', *Journal of Public Health and Policy* 19: 68–87.
- Room, R., Jernigan, D., Carlini-Marlatt, B., Gureje, O., Mäkelä, K., Marshall, M., Medina-Mora, M. E., Monteiro, M., Parry, C., Partanen, J., Riley, L., Saxena, S. (2002), *Alcohol and developing societies: a public health approach*, Finnish Foundation for Alcohol Studies, Helsinki and World Health Organisation, Geneva.
- Schechter, E. J. (1986), 'Alcohol rationing and control systems in Greenland', *Contemporary Drug Problems* 15: 587–620.
- Shibuya, K., Ciercierski, C., Guindon, E., Bettcher, D. W., Evans, D. B., Murray, C. J. L. (2003), 'WHO framework convention on tobacco control: development of an evidence based global public health treaty', *British Medical Journal* 327: 154–157.
- Shiffman, S., Gitchell, J., Pinney, J. M., Burton, S. L., Kemper, K. E., Lara, E. A. (1997), 'Public health benefit of over-the-counter nicotine medications', *Tobacco Control* 6: 306–310.
- Siegel, M., Biener, L. (1997), 'Evaluating the impact of statewide anti-tobacco campaigns: the Massachusetts and California tobacco control programs', *Journal of Social Issues* 53: 147–168.
- Single, E. (1989), 'The impact of marijuana decriminalisation: an update', *Journal of Public Health Policy* 10: 456–466.
- Single, E., Christie, P., Ali, R. (2000), 'The impact of cannabis decriminalisation in Australia and the United States', *Journal of Public Health Policy* 21 (2): 157–186.
- Sly, D. F., Hopkins, R. S., Trapido, E., Ray, S. (2001), 'Influence of a counteradvertising media campaign on initiation of smoking: the Florida "truth" campaign', *American Journal of Public Health* 91: 233–238.

- Sly, D. F., Trapido, E., Ray, S. (2002), 'Evidence of the dose effects of an antitobacco counteradvertising campaign', *Preventive Medicine* 35: 511–518.
- Taylor, A., Chaloupka, F. J., Guindon, E., Corbett, M. (2000), 'The impact of trade liberalization on tobacco consumption', in Jha, P., Chaloupka, F. J. (eds), *Tobacco Control in Developing Countries*, Oxford University Press, Oxford, 343–364.
- Törrönen, J. (2003), 'The Finnish press's political position on alcohol between 1993 and 2000', *Addiction* 98: 281–290.
- Valverde, M. (2003), *Law's dream of a common knowledge*, Princeton University Press, Princeton, NJ.
- Wagenaar, A. C., Toomey, T. L. (2000) 'Alcoholic policy: the gap between legislative action and current research', *Contemporary Drug Problems* 27: 681–733.
- Wakefield, M., Flay, B., Nichter, M., Giovino, G. (2003), 'Effects of anti-smoking advertising on youth smoking: a review', *Journal of Health Communication* 8: 229–247.
- WODC (2006), 'Coffeeshops en cannabis', in *Justitiële verkenningen 2006/01*, WODC, Intraval, Groningen, 46–60.

Editorial postscript

This chapter focuses deliberately on experiences with regulating alcohol and tobacco. It does not include crystal gazing for regulation of legalised cannabis. In the production of the monograph, some reviewers felt that some more information on specific regulatory controls on cannabis was required. The chapter, however, remains useful in drawing attention to the many 'unknowns' faced when regulating psychoactive substances. For illicit drugs in general, economic analysis of market size is relatively immature, relies on broad assumptions and triangulation of diverse datasets (seizures, prevalence, retail prices, arrests, potency, etc.), and usually implies a large margin for error. So significant preparatory work would need to be done before regulatory models could be seriously considered for cannabis. At this point, it is premature to discuss topics such as product certification and licensing, feasibility studies, econometric analysis, market sizing, regulatory standards, fiscal forecasting, seasonality, etc. with any degree of certainty. While some exploratory work has been done on market sizing in the EU, estimates to date remain problematic. In particular, regulation would need to respond to findings that home-grown self-supply and informal supply 'among friends' make up a substantial amount of the market in EU countries (see Legget and Pietschmann, this monograph) (Table 3).

In terms of further reading on economic controls of cannabis in a (hypothetical) regulated market, the subject has recently experienced a revival in interest. This is true both of economic and statistical journals, as well as in the usual drugs and public health journals. As a basic introduction, the difficulties of drug market sizing formed the subject of a chapter in the UNODC's World Drug Report 2005 (UNODC, 2005). Specific studies on cannabis are generally based on patterns that follow the decriminalisation of cannabis use. Specific studies include those in Australia (Clements and Zhao, 2005),

Table 3: Recent estimates of the size of the illicit cannabis market in four EU Member States

Country	Reference year	Population	Estimated annual retail market value (EUR, millions)	Source
Ireland	2003	3 883 159 (2002)	379 (374.465 resin plus 4.03518 herb)	Connolly (2005)
France	2007	62 518 600 (2005)	832	Costes (2007)
The Netherlands	2004	No data	244–371 (211–283: domestic market; 43–88: non-domestic market)	Bieleman and Snippe, (2006), in WODC (2006)
UK (England and Wales)	2003/2004	52 481 000 (England and Wales, 2002)	1 285 (£900 800 000; euro conversion rate EUR 1 = £0.701 (ECB monthly rate at December 2004)	Pudney et al. (2006)

British Columbia (Easton, 2004) and Massachusetts (Miron, 2003). In Europe, while a regulated cannabis market is frequently a subject of lobbyists’ pamphlets (e.g. Holtzer, 2004; Atha, 2004), policy-oriented study has either been restricted to domestic market profiling (Bramley-Harker, 2001; Pudney, 2004) or has favoured the broad-brush analysis of illicit drugs in general (Clark, 2003; Bretteville-Jensen, 2006). A recent study in France (Ben Lakhdar, 2007) provides a useful exploration of how the French cannabis market is structured, in terms of volume and values. Such quantitative study is rare in Europe, yet would contribute greatly to our understanding of the economics of cannabis.

Selected reading on a regulated cannabis market

Atha, M. (2004), *Taxing the UK drugs market*, Independent Drug Monitoring Unit.

Ben Lakhdar, C. (2007), *Le trafic de cannabis en France*, OFDT, Paris.

Bramley-Harker, E. (2001), *Sizing the UK market for illicit drugs*, RDS Occasional Paper 74: 35–46, Home Office, London.

Bretteville-Jensen, A. (2006), ‘To legalize or not to legalize? Economic approaches to the decriminalization of drugs’, *Substance Use and Misuse* 41 (4): 555–565.

Cameron, L., Williams, J. (2001), ‘Substitutes or Complements? Alcohol, Cannabis and Tobacco’, *The Economic Record* 77 (236): 19–34.

Caputo, M., Ostrom, B. (1994), ‘Potential tax revenue from a regulated marijuana market: a meaningful revenue source’, *American Journal of Economics and Sociology* 53: 475–490.

Chaloupka, F. et al. (eds) (1999), *The economic analysis of substance use and abuse: an integration of econometric and behavioral economic research*, University of Chicago Press, Chicago.

Clark, A. (2003), *The economics of drug legalization*, Delta, Paris.

Clements, K. (2006), ‘Pricing and packaging: the case of marijuana’, *Business Journal* 79: 2019–2044.

- Clements, K., Zhao, X. (2005), 'Economic aspects of marijuana', University of Western Australia, conference paper.
- Easton, S. (2004), 'Marijuana growth in British Columbia', *Public Policy Sources*, Fraser Institute Occasional Paper.
- Farrelly, M., Bray, J., Zarkin, G., Wendling, B. (2001), 'The joint demand for cigarettes and marijuana: evidence from the national household surveys on drug abuse', *Journal of Health Economics* 20: 51–68.
- Gettman, J. (2006), 'Marijuana Production in the United States', *The Bulletin of Cannabis Reform*, Issue 2, December.
- Hall, W., Pacula, R. (2003), 'Cannabis as a legal substance', chapter 18 in Hall, W., Pacula, R. (2003), *Cannabis use and dependence: public health and public policy*, Cambridge University Press, Cambridge.
- Holtzer, T. (2004), *Globales Cannabisregulierungsmodell/Global cannabis regulation model*, Verein für Drogenpolitik, Mannheim.
- Kopp, P., Fenoglio, P. (2000), 'Le coût social des drogues licites (alcool et tabac)', *Toxicomanies* 22, Observatoire Français des Drogues.
- MacCoun, R., Reuter, P. (2001) *Drug war heresies: learning from other vices, times and places*. Cambridge University Press, Cambridge.
- Miron, J. (2003), *The effect of marijuana decriminalization on the budgets of Massachusetts governments, with a discussion of decriminalization's effect on marijuana use*, Drug Policy Forum of Massachusetts.
- Pudney, S. (2004), 'Keeping off the grass? An econometric model of cannabis consumption by young people in Britain', *Journal of Applied Econometrics* 19 (4): 435–453.
- Selvanathan, S., Antony Selvanathan, E. (ed.) (2005), *The demand for alcohol, tobacco and marijuana: international evidence*, Ashgate Publishers, London.
- Single, E., Christie, P., Ali, R., (2000), 'The impact of decriminalization in Australia and the United States', *Journal of Public Health Policy* 21: 157–186.
- Thies, C., Register, F., (1993), 'Decriminalisation of marijuana and the demand for alcohol, marijuana and cocaine', *The Social Science Journal* 30: 385–399.
- UNODC (2005), 'Estimating the value of illicit drug markets', Chapter 2 of *World Drugs Report 2005*, Vienna.
- Wilkins, C. et al. (2002), 'The cannabis black market and the case for the legalisation of cannabis in New Zealand', *Social Policy Journal of New Zealand* 18: 31–43.
- Wodak, A., Cooney, A. (2004), 'Should cannabis be taxed and regulated?', *Drug and Alcohol Review* 23(2): 139–141.
- Zhao, X., Harris, M. (2004), 'Demand for marijuana, alcohol and tobacco: participation, levels of consumption, and cross-equation correlations', *Economic Record* 80: 394–410.

Chapter 9

An open front door: the coffee shop phenomenon in the Netherlands

Keywords: cannabis – coffee shops – drugs tourism – enforcement – the Netherlands – regulation

Setting the context

A European monograph on cannabis would not be complete without a chapter on Dutch ‘coffee shops’. ‘Coffee shop’ in the Dutch context is a euphemism for cafés where, since 1976, the sale and consumption of cannabis has been tolerated.

This chapter provides a number of surprising insights on the coffee shop phenomenon, from the leading Dutch authority on the subject. The Netherlands has relatively low prevalence of cannabis use (see Monshouwer et al., this monograph), despite the proximity of retail outlets. The 737 coffee shops (2004) are also found in a small number of towns, and their numbers have dwindled as municipalities have sought to tighten their licensing. The chapter also describes a number of features of coffee shops: the AHOJ-G operating restrictions, under which coffee shops operate; the challenges in enforcement of ensuring a limited supply of 500g on the premises ⁽¹⁾; the ‘back door problem’ and controlling links with wider trafficking and crime. Indeed, beyond such retail outlets, the Netherlands is a wholesale hub in the trafficking of Moroccan cannabis resin across northern Europe (see Gamella, this monograph).

Coffee shops are controversial, both within the Netherlands and in the international context. This chapter remains focused on the domestic situation in the Netherlands: coffee shops and their impact on Dutch drug use patterns. However, coffee shops also

⁽¹⁾ This problem has become known as ‘the back door’ problem in the Netherlands. A recent case in the town of Terneuzen highlights the problem. A police check of the coffee shop Checkpoint in June 2007 found over 5kg of cannabis on the premises and over 90kg in a nearby warehouse (www.hvzeeland.nl/nieuws.php?id=5542).

Table 1: Dutch coffee shops at a glance

Number of coffee shops in the Netherlands	Coffee shop density (in the 103 localities with coffee shops present)	Number of people employed at coffee shops	Estimated size of domestic cannabis market	Estimated size of non-domestic cannabis market	Average estimated revenue per coffee shop from cannabis sales
737 (2004)	One coffee shop per 28715 inhabitants. Highest density: Amsterdam (one coffee shop per 2969 inhabitants)	3400	EUR 211–283 million (32–43 tonnes)	EUR 43–88 million (6.6–13.3 tonnes)	EUR 280000–380000

Sources: Bieleman et al. (2005), Bieleman and Snippe (2006).

play an interesting role in cross-border supply: annual sales volumes to non-Dutch buyers are estimated at 6.6 to 13.3 tonnes (Bieleman and Snippe, 2006). Cross-border drugs tourism has led to considerable and repeated criticism of the Dutch coffee shop policy, particularly among neighbouring countries. A counter argument of note is that cannabis prevalence among young people in the Netherlands is lower than many of its neighbouring countries, and that most cannabis consumed in these countries will not have been purchased at Dutch coffee shops (Table 1).

Perhaps most significantly, Dutch coffee shops play a symbolic role as a paradigm of liberal cannabis policies. In addition to their common appearance in academic studies of drug policy, they have become associated in popular culture with the liberal attitudes of the Netherlands. The coffee shops themselves do little to prevent such notoriety, and play a role in cannabis advocacy and the seed distribution businesses operating from the Netherlands. So, although in the Netherlands discussions in recent years have focused on the inevitability of supply — i.e. underground dealers will supply the demand which is currently served by coffee shops ⁽²⁾ — Dutch drug policy is likely to remain a controversial subject.

⁽²⁾ This was one of the broad conclusions of the *Cannabis zonder coffee shop* report.

Further reading

- Bieleman, B., Snippe, J. (2006), 'Coffeeshops en criminaliteit', in *Coffeeshops en cannabis*, Justitiële verkenningen 2006/01, WODC, IntraVal, Groningen, 46–60.
- Bieleman, B., Goeree, P., Naayer, H. (2005), *Aantallen coffeeshops en gemeentelijk beleid 1999–2004: Coffeeshops in Nederland 2004*, Ministerie van Justitie, IntraVal-WODC, Groningen.
- Korf, D., Wouters, M., Nabben, T., Ginkel, P. van (2005), *Cannabis zonder coffeeshop: niet-gedoogde cannabisverkoop in tien Nederlandse gemeenten*, Criminologisch Instituut Bongers, Universiteit van Amsterdam.
- Mensinga, T. (2006), 'Dubbel-blind, gerandomiseerd, placebogecontroleerd, 4-weg gekruist onderzoek naar de farmacokinetiek en effecten van cannabis', RIVM rapport 267002001/2006, RIVM.
- Ministerie van Volksgezondheid, Welzijn en Sport (2003), *Drug policy in the Netherlands*, International Publication Series Health, Welfare and Sport No. 18, The Hague.
- Niesink, R., Rigter, S., Hoek, J. (2005), *THC-concentraties in wiet, nederwiet en hasj in Nederlandse coffeeshops (2004-2005)*, Trimbos Instituut, Utrecht.
- Trimbos Instituut and EMCDDA (2007), *Report on the drug situation 2006, Reitox national focal point report to the EMCDDA*, Utrecht.
- WODC (2006), Justitiële verkenningen 2006/01, *Coffeeshops en cannabis*, WODC, IntraVal, Groningen.

An open front door: the coffee shop phenomenon in the Netherlands

Dirk Korf

Introduction

Although cannabis is still an illicit drug in the Netherlands, herbal cannabis and cannabis resin are openly sold in so-called ‘coffee shops’. In general, coffee shops are café-like places, although some function more as a store where one can buy, but not use cannabis. In this paper we first describe the process of decriminalisation of cannabis and the evolution of coffee shops in the Netherlands. Then we discuss long-term trends in cannabis use in the Netherlands, both among the general population and among students at secondary schools, followed by exploring some problems regarding the causal relationship between coffee shops and trends in cannabis use in the Netherlands. Next, we examine the role of coffee shops relative to other cannabis sellers at retail level. Finally, we discuss recent developments regarding the supply of coffee shops.

From underground market to coffee shops

The Netherlands was one of the first countries where cannabis became the object of statutory regulation. The import and export of cannabis was introduced into the Opium Act in 1928. Possession, manufacture and sale became criminal offences in 1953. Statutory decriminalisation of cannabis took place in 1976. De facto decriminalisation, however, set in somewhat earlier.

With regard to the cannabis retail market in the Netherlands, four phases can be distinguished.

Phase 1

During the first stage, the 1960s and early 1970s, the Dutch cannabis retail market was a predominantly underground market. Cannabis was bought and consumed in a subcultural environment, which became known as a youth counterculture.

Phase 2

The second stage was ushered in when Dutch authorities began to tolerate so-called ‘house dealers’ in youth centres. Experiments with this approach were formalised through statutory decriminalisation in the revised Opium Act of 1976. This law distinguishes between two types of drugs: on the one hand, hemp products (Schedule II drugs), and on the other hand, drugs that represent an ‘unacceptable’ risk (Schedule I drugs, such as heroin and cocaine). The law also differentiates on the basis of the nature of the offence. For example, drug use is not an offence, possession of up to 30 grams of cannabis is a petty offence or misdemeanour, while possession of more than 30 grams is a criminal offence.

Official national *Guidelines for Investigation and Prosecution* came into force in 1979. These guidelines are founded on *the expediency principle*, a discretionary principle in Dutch penal law which allows authorities to refrain from prosecution without first asking permission of the courts. Basically, the expediency principle can be applied in two ways. The first favours prosecution: prosecution is a default response, but is waived if there are good reasons to do so (‘prosecution, unless ...’). This case-directed approach was common in the Netherlands until the end of the 1960s.

The second approach applies the expediency principle differently: prosecution takes place only if it is expedient and serves the public interest (‘no prosecution, unless ...’). Society-wide prosecution of cannabis offences was believed not to serve the public interest: it would stigmatise many young people and socially isolate them from society. According to the 1979 national guidelines, the retail sale of cannabis to consumers would be tolerated, provided the house dealer met the so-called AHOJ-G criteria. These criteria are:

- no overt advertising (*affichering*);
- no hard drugs;
- no nuisance (*overlast*);
- no underage clientele (*jongeren*); and
- no large quantities (*grote hoeveelheden*).

Small-scale dealing of cannabis thus remained an offence from a legal viewpoint, but under certain conditions would not be prosecuted. It should be acknowledged that this legal tolerance was initiated before the Opium Act was revised in 1976, and became more visible after 1979 with the entry into force of the national guidelines and AHOJ-G criteria. So by the end of the 1970s, the *house dealer* had become a formidable competitor to the street dealer.

Phase 3

In the third stage, cannabis resin and herbal cannabis were sold predominantly in café-like places, which have become known as 'coffee shops'. Although the government never intended this development, through case law it was decided that coffee shops were to be tolerated according to the same criteria as house dealers. During the 1980s coffee shops captured an increasingly large share of the Dutch retail cannabis market (Jansen, 1991).

Phase 4

The fourth stage began in the mid-1990s, when legislative onus was placed on curbing the number of coffee shops. Since then, the number of coffee shops has steeply declined from about 1 500 to 813 in 2000 and further to 737 in 2004 (Bieleman and Goeree, 2000; Bieleman et al., 2005). Moreover, in 1996 local communities received the opportunity to decide whether or not they would allow coffee shops in their municipality. To date, 77% of the 483 communities have decided not to allow coffee shops at all. Consequently, they can close down coffee shops even if they do not violate the AHOJ-G criteria. In addition, the minimum age for visitors was increased from 16 to 18 years.

So, coffee shops are not distributed evenly over the country. Over half (52%) of all coffee shops are located in the five largest communities (> 200 000 inhabitants), while only 1% can be found in communities with less than 20 000 inhabitants. Although only 5% of the national population lives in Amsterdam, the city is the home of one-third of all coffee shops in the country.

Trends in cannabis use

From an analysis of available data on the prevalence of cannabis use between the late 1960s and the late 1990s, we concluded that there was little room to doubt that cannabis use in the Netherlands spread rapidly around 1970 (Korf et al., 2002). Most probably, cannabis use among youths in the Netherlands evolved in two waves, with a first peak around 1970, a low during the late 1970s and early 1980s, and a second peak in the mid- to late-1990s.

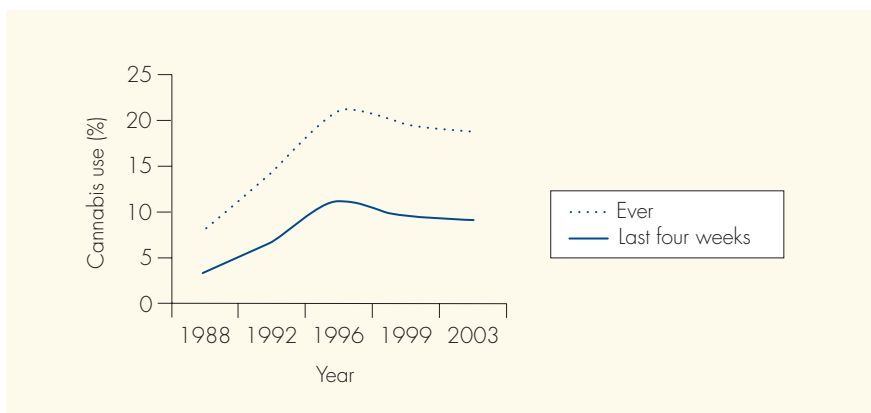
Prior to the Second World War, cannabis use in the Netherlands had hardly been heard of, and this did not change much in subsequent years. The 1950s witnessed the introduction of cannabis in the Netherlands, when herbal cannabis was used by small groups of jazz musicians and other artists who had learned to use it while abroad, as well as foreign seamen and Germany-based US military personnel, in particular in Amsterdam (Cohen, 1975; de Kort and Korf, 1992).

In the course of the 1960s, cannabis use in the Netherlands rapidly gained popularity. An increasing number of adolescents began smoking it, but not until the end of the decade did a cannabis smokers' subculture emerge. Cannabis spread significantly in the wake of the hippie movement, and smoking cannabis at the national monument in Dam Square or in the Vondelpark in Amsterdam became a staple of a burgeoning international youth sub-culture (Leuw, 1973).

The first indication of the rapid growth in the popularity of cannabis towards the end of the 1960s can be found in school surveys. In 1969 as many as 9% of the students in the final form at secondary school reported having used cannabis at least once. Two years later this percentage had doubled to 18%. Yet rates did not continue to rise in subsequent years. In 1973, lifetime prevalence was again put at 18% (see Korf, 1995). It was more than a decade before the next national school survey was carried out, in 1984. This survey yielded a much lower lifetime prevalence of cannabis use (5%). To a considerable degree, however, the lower rate can be explained by inconsistencies in the samples. If comparable age groups are examined, the difference between 1973 and 1984 rates is much smaller: 18% ever use of cannabis for students with a mean age of 17.5 years in 1973; 12% for students 17 years and older in 1984 (Plomp et al., 1990).

Unfortunately, these school surveys did not address nationally representative samples. Since 1988 nationally representative surveys have been conducted on the extent to which secondary school students aged 12 and older have experience with alcohol, tobacco, drugs and gambling. From 1988 to 1996, cannabis rates among students rose, but stabilised in the late 1990s, followed by a drop (Monshouwer et al., 2004). (Figure 1).

Figure 1: Cannabis use among secondary school pupils, aged 12 years (1988–2003)



General population surveys are another indicator of trends in cannabis use. Between 1970 and 1991 six national household surveys have been conducted in the Netherlands (see Korf, 1995). They reveal a growing percentage of people that report having used cannabis at least once in their lives: from 2–3% in 1970, to 6–10% during the 1980s and to 12% in 1991. In 1997, a new series of general population studies was initiated, using large representative samples of people aged 12 years and over. In addition to figures on lifetime use of — amongst others — cannabis, this National Prevalence Study also includes data on current use (Abraham et al., 1999). According to the 1997 data, the vast majority have never tried cannabis and only one in six respondents have ever used cannabis (15.6%). One in 40 respondents (2.5%) used cannabis in the month prior to the interview (current use). The second National Prevalence Study, conducted in 2001, revealed a lifetime prevalence rate of 17% and 3% for last month use (Abraham et al., 2002). A different age group (15–64 years) was studied in the third National Prevalence Study (2005/2006). Between 1997 and 2005–2006, trend analysis showed: a decrease in last year prevalence in the age group 15–24 years; an increase in lifetime, last year and last month prevalence among the age group 25–44 years; and an increase in last month prevalence in the age group 45–64 years (Rodenburg et al., 2007).

Cannabis use is not distributed evenly across the Netherlands. Cannabis use is more prevalent in urban than in rural areas. Amsterdam tops the list with respect to ever use and current use. Such an uneven geographical spread of cannabis use is not only typical for the Netherlands, but can also be found in other countries (Partanen and Metso, 1999). Since 1987, five surveys have been conducted among the general population of Amsterdam aged 12 years and over, applying a similar methodology as in the National Prevalence Study. Prevalence rates increased (Abraham et al., 2003). To a large extent, this increase reflects a generation effect. This generation effect also helps to explain why rates for ever use increase much more strongly than those for current use (Figure 2). The

Figure 2: Trend in cannabis use, general population, Amsterdam, 12+ years (1987–2001)

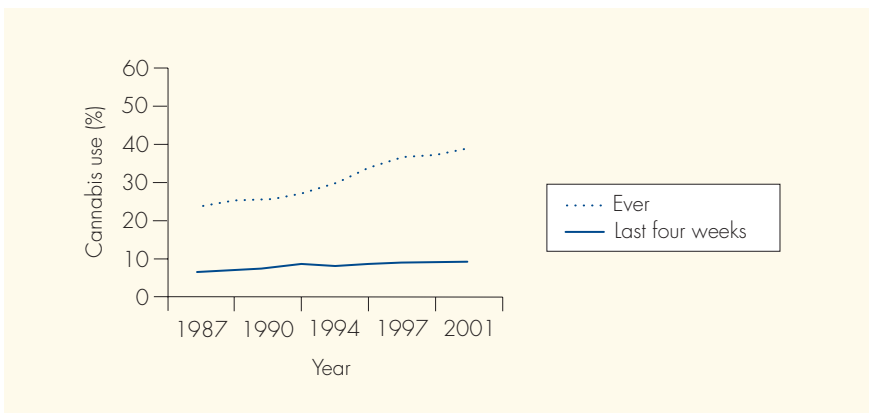
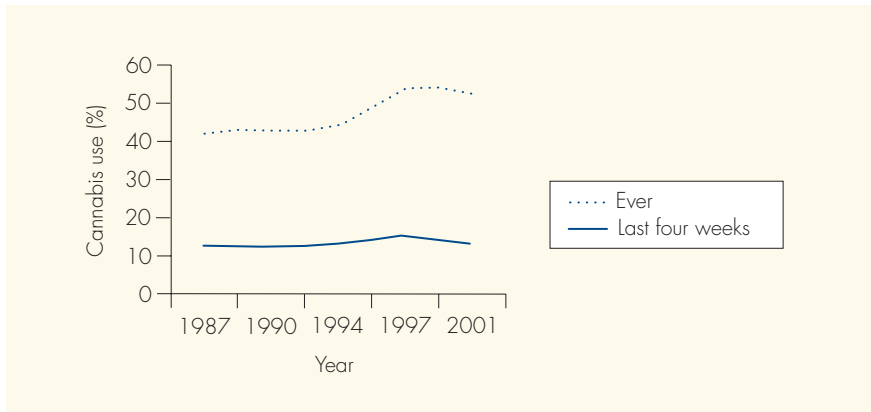


Figure 3: Trend in cannabis use, general population, Amsterdam, 25–29 years (1987–2001)



majority of the adult ever users in Amsterdam have stopped using cannabis. While many young ever users are currently taking cannabis, few older ones continue to do so. The mean age of cannabis use in Amsterdam remained stable at around 20 years. For the age cohort of 25–29 years, lifetime use first increased in the 1990s and then stabilised, while current use remained quite stable during the period (Figure 3).

Decriminalisation and cannabis use

During the transition from the first to the second phase in Dutch cannabis policy, the many underground selling points became consolidated into a more limited number of formalised sales outlets that were publicly accessible yet shielded from public view. During the third phase, availability increased markedly in numerous coffee shops. More recently, availability may have decreased because of the declining number of coffee shops. It is striking that the trend in cannabis use among youth in the Netherlands parallels our four stages in the availability of cannabis. The number of adolescent cannabis users peaked when cannabis was distributed through an underground market during the late 1960s and early 1970s, when the drug was available through many small-scale retailers (street dealers, in homes and bars). Adolescent use then decreased as house dealers superseded the underground market during the 1970s. It increased again in the 1980s after coffee shops took over the sale of cannabis. And it stabilised or slightly decreased at the end of the 1990s, when the number of coffee shops was reduced.

Rising or falling cannabis consumption need not be the unequivocal result of decriminalisation or criminalisation. In order to study the possible link between decriminalisation and the evolution of Dutch cannabis use, first we need to analyse the

prevailing rates of cannabis use both before and after decriminalisation. Moreover, longitudinal trends in cannabis use in the Netherlands can only properly be ascribed to decriminalisation when it is made plausible that they are causally related.

In line with MacCoun and Reuter (1997), reasoning by analogy might be helpful in getting closer to an understanding of the nature of the link between decriminalisation and cannabis prevalence rates in the Netherlands. How do the Dutch trends in the cannabis case compare to those in other Western nations? Such a question is not easy to answer, mainly because there are few countries where cannabis consumption has been consistently and systematically recorded over the years.

The USA has a relatively long tradition of surveys on drug use and the American figures consistently appear to be higher than those in the Netherlands (Plomp et al., 1990; NDM, 2006). Clearly the USA, as the prototype of a prohibitionist approach towards cannabis, reports higher cannabis consumption than the Netherlands, the prototype of anti-prohibitionism. Marijuana use among youth in the USA also evolved in waves, with a peak during the late 1970s, a decline in the 1980s, a rise in the 1990s and then stabilisation. Harrison (1997) concludes that such a wave-like development can be understood as a verification of Musto's more general model on trends in drug use (Musto, 1987). In addition, structural factors such as the post-Second World War baby boom and drug education (affecting health risk perception) might help to explain the development in marijuana use in the USA (Harrison, 1997). Other European countries have also reported a wave-like trend in cannabis use (Kraus, 1997). For example, cannabis use spread rapidly in (West) Germany toward the end of the 1960s, followed by stabilisation and decline in the early 1970s and then an increase in the 1980s (Reuband, 1992; Kraus, 1997). The rising use of cannabis in Germany continued in the 1990s (Kraus and Bauernfeind, 1998; Kraus et al., 1998).

Cannabis use in some other countries with a prohibitionist approach towards cannabis — Sweden in particular — is substantially lower than in the Netherlands. Although this has been used as supporting evidence that prohibition deters use, the argument does not hold when seen in relation to data from other prohibitionist countries, for example, the USA, and elsewhere in Europe. From the available data from general population surveys in 10 Member States of the EU (which are not absolutely comparable), the EMCDDA concluded that the level of cannabis use varies strongly within the EU (EMCDDA, *Annual Report 2001*); from 9.7% in Finland to 25% in the UK (England and Wales). The Netherlands is placed somewhere in the middle (and this would most probably be lower if its level of urbanisation were taken into account). From a comparison of data from general population surveys in Germany (Kraus et al., 1998) and the UK (Ramsay and Partridge, 1999), we concluded that adolescents and young adults in these countries have showed a similar trend to that in the Netherlands: increasing cannabis use from the late 1980s onwards (Korf et al., 2002).

So, trends in cannabis use in the Netherlands appeared to run along similar lines to those in other European countries, and Dutch figures on cannabis use between the late 1960s and the late 1990s were not out of line with those from countries that did not decriminalise cannabis. Over time, prevalence of cannabis use shows a wave-like trend in many countries, including the Netherlands. This supports Reuband's earlier conclusion that cannabis use trends evolve relatively independently from drug policy, and that countries with a 'liberal' cannabis policy do not have higher or lower rates than countries with a more repressive policy (Reuband, 1995).

From the data discussed so far, it appears unlikely that decriminalisation of cannabis causes an increase in cannabis use. However, before we draw such a final conclusion, we need to address three issues. First, we have compared Dutch prevalence data with those from countries that did not officially decriminalise cannabis. However, the actual enforcement of cannabis offences may be less strict than the law suggests. Second, at the level of the 'dependent variable', the question is 'what is the most appropriate indicator for cannabis use?' Third, we must take into account the accessibility of coffee shops: as mentioned, there is a minimum age for visiting coffee shops.

How do drug laws relate to the actual enforcement of cannabis offences? The Netherlands has separate schedules for cannabis and other illicit drugs. The use of cannabis is not illegal, and penalties for trafficking are higher than for possession. In this respect, the Dutch drug law is not unique. There are other EU countries with differential drug laws (two or more schedules), where cannabis use is not illegal, and where the drug law sets higher penalties for trafficking than possession (see Ballotta et al., this monograph; Korf, 1995; Leroy, 1992). Most EU countries have penalties for cannabis possession, ranging from a fine to incarceration (EMCDDA ELDD, 2001). According to Kilmer (2002), in practice most arrests for cannabis possession in EU Member States appear to only lead to a fine, while few data are available on the levels of these fines and about what happens when they are not paid. So Kilmer examined actual cannabis law activities within a number of Western countries, by comparing police capacity, enforcement of and punishment for cannabis possession laws. He concluded that the probability of cannabis users being arrested for cannabis possession is generally between 2 and 3%. Probability of arrest was fairly similar (2–3%) in EU countries with relatively low cannabis prevalence rates (e.g. Sweden: arrest rate, 2.4% in 1997) and those with higher rates (e.g. United Kingdom: arrest rate, 2.1% in 1996 and 2.9% in 1998). Consequently, formal criminalisation of cannabis possession rarely leads to actual criminalisation in practice. So it appears plausible that current cannabis laws in EU Member States, as well as other Western countries, have little deterrent effect on cannabis use.

It is not uncommon to discuss the effects of decriminalisation of cannabis in the Netherlands on the basis of data from school surveys. The analysis by MacCoun and

Reuter (1997) was largely based on data from school surveys, and we included such figures in our analysis earlier in this chapter as well. Unfortunately, this is not without problems. In 1996 the minimum age for coffee shop visitors was raised from 16 to 18 years. Consequently, minors are not allowed to buy and use cannabis in coffee shops, which means that prevalence rates of cannabis use among youth below the age of 18 cannot be defined as valid indicators in the analysis of the effects of decriminalisation.

In a secondary analysis of national school survey data from 1992, 1996 and 1999 we looked at how the use of cannabis evolved amongst adolescents (Korf et al., 2001). We faced two difficulties. First, school populations are constantly changing, partly due to an ongoing rise in percentages of ethnic minority students. Second, samples do not always precisely reflect school populations. Statistical bias can be corrected to an extent by weighting, but that still does not ensure full representativeness. Both the real changes in the student population and the sampling errors could potentially damage the reliability of the cannabis use statistics. We allowed for this as much as possible by performing logistic regression analysis. This enabled us to detect any changes in the use of cannabis that were not due to differential background characteristics (gender, ethnicity, school type and urbanisation) in the samples. Analysis revealed a break in the previous upward trend in current cannabis use among 16–17-year-olds after the raising of the age limit for coffee shops in 1996. Cannabis use stabilised between 1996 and 1999. In addition, the analysis indicated a shift in supply from coffee shops to other sources. Current 16–17-year-old cannabis users among the students in 1999 bought their cannabis less often in coffee shops (25.7%) than those from 1996 (45.2%). Logistic regression led to the same conclusion: the 1999 students showed a greater likelihood of buying cannabis outside coffee shops (an odds ratio of 0.76).

These figures are a strong indication that the higher age limit at coffee shops has indeed resulted in a reduction of cannabis sales to adolescents in coffee shops, in favour of more informal supply through friends (from 47.6% in 1996 to 66.5% in 1999). These figures are somewhat problematic as what has been reported as buying in a coffee shop could also mean that the respondents had someone else buy the drug there. Nevertheless, the data strongly suggest that raising the minimum age for coffee shops had an effect on buying behaviour. According to the 2003 national school survey, most current cannabis users among students aged 18 years buy their cannabis also or exclusively in coffee shops, substantially more often than younger users (Monshouwer et al., 2004). It is tempting to interpret the nationwide stabilisation in adolescent cannabis use as a result of raising the age limit. Adolescents are now more likely to obtain cannabis from friends and acquaintances instead of from coffee shops. Thus, at the user level we see an apparent displacement of the cannabis market (Korf et al., 2001).

In conclusion, trends in the lifetime prevalence of cannabis use in the Netherlands developed in parallel to changes in cannabis policy. Alongside the rapid growth in

the number of coffee shops, we observed a significant increase in prevalence rates. However, this does not automatically support the conclusion that decriminalisation has led to an increase in cannabis consumption. First of all, lifetime prevalence is often not an adequate indicator since it largely reflects a ‘generation effect’. Current (last month) use seems to be a better indicator, although from the perspective of harm reduction it might be argued that ‘problem use’ is an even better one. Unfortunately, there is no standardised indicator for problematic cannabis use.

Reasoning by analogy through cross-national comparison partly leads to conclusions other than MacCoun and Reuter’s (1997). In particular, their conclusion that commercial access — through coffee shops — is associated with growth in cannabis use has to be questioned. Their study largely focused on data from the USA and Nordic countries (Denmark and Norway). Within a Western European context, prevalence rates in the Nordic countries are generally rather low, with the exception of Denmark, which combines relatively high lifetime figures with low current use. Comparison with other EU countries shows striking similarities with Dutch figures on current cannabis use. In addition, neighbour countries, as well as the USA, report similar trends in current cannabis use over time. Cannabis use in neighbour countries also shows a wave-like development, so it seems implausible that the trends in cannabis use in the Netherlands were causally related to Dutch cannabis policy. It seems more likely that the parallel development of cannabis use with stages in the decriminalisation process in the Netherlands was accidental, and that trends in cannabis use were predominantly affected by other factors that were not unique to the Netherlands.

Most probably, these factors relate to general youth trends that make cannabis more or less fashionable and acceptable. We were able to include more recent figures on cannabis than MacCoun and Reuter, and these data show that cannabis use stabilised among Dutch youth in the late 1990s. At first glance, this seems to be a result of raising the minimum age for access to coffee shops from 16 to 18 years. However, informal networks of friends appear to have quickly taken over the role of coffee shops as retail suppliers of cannabis. Most probably, the role of such informal networks is similar to those in other European countries. This leads to the conclusion that regulating the cannabis market through law enforcement has only a marginal, if any, effect on the level of cannabis consumption.

The restricted role of coffee shops

As has been mentioned, most communities in the Netherlands do not have coffee shops at all, in particular smaller towns and villages. In 2003–2004 we conducted a study on the ‘non-tolerated’ sale of cannabis in the Netherlands (Korf et al., 2004). By non-tolerated cannabis dealers, we meant the ones outside the officially tolerated coffee

shops. The study focused on the retail trade and not on the coffee shop suppliers (the back door) or the middle and higher levels of the cannabis market.

The study was conducted in 10 municipalities with more than 40 000 inhabitants, that were geographically spread throughout the country and different as regards their size and coffee shop density (number of coffee shops per 10 000 residents). Eight of the municipalities had one or more coffee shops and the other two did not have any official coffee shop at all. Local experts were interviewed in all 10 communities, a survey was made among approximately 800 current cannabis users (not recruited in coffee shops) in seven communities and an ethnographic field study was conducted in five communities.

In all the municipalities we studied, there was a non-tolerated cannabis market at the retail level. We distinguished two main categories: fixed and mobile sale points. The fixed non-tolerated sales points can be divided into home dealers and under-the-counter dealers primarily at clubs or pubs. The mobile non-tolerated sales points can be divided into home delivery after cannabis is ordered by telephone (mobile phone dealers) and street sales in the street and at spots where people hang out (street dealers). In addition, there are home growers, who can be either fixed or mobile dealers.

We found that, whether or not municipalities have coffee shops, the non-tolerated sale of cannabis is widespread. At the retail level, the non-tolerated cannabis market was very similar in all the municipalities in the study, and the same sales patterns were found in virtually all municipalities. In the municipalities with officially tolerated coffee shops, an estimate of approximately 70% of the local cannabis sales went directly through the coffee shops. The higher the coffee shop density, the greater their percentage of the local sales. In municipalities with no coffee shops or a low coffee shop density, users most frequently bought cannabis somewhere else, as well as in a coffee shop.

There are various reasons why non-tolerated cannabis dealers also operate in municipalities with coffee shops. The major reasons are the geographic distribution of the coffee shops, their opening hours and the minimum age they adhere to. In particular, it is the mobile phone dealers and home dealers who take advantage of the geographic gaps in the cannabis market and are mainly active in districts where coffee shops are rare or non-existent. Additionally, coffee shops are not open 24 hours a day and the non-tolerated dealers explicitly take advantage of this by being easy to reach customers at times when the coffee shops are closed. For minors, the minimum age at coffee shops is an important reason to have cannabis resin or herbal cannabis delivered, or to buy it on the street or from a home dealer. In addition, non-tolerated dealers can serve as an attractive alternative for coffee shops because users can buy larger quantities of cannabis, and sometimes the cannabis is sold more cheaply.

The 'back door' of coffee shops: diverging policy options

Originally, most cannabis used in the Netherlands was cannabis resin, and until the mid-1980s most cannabis was imported. Due to strong improvement in cultivation techniques, domestically grown herbal cannabis became more and more popular. In the early 1990s approximately 50% of the cannabis used in the Netherlands was domestically grown (Boekhoorn et al., 1995). In the second half of the 1990s, the popularity of domestically cultivated herbal cannabis further increased. According to a study among experienced cannabis users by Cohen and Sas (1998), about half preferred herbal cannabis, mostly 'nederwiet', one-quarter preferred cannabis resin and another quarter had no preference. In 2001, from a survey among coffee shop visitors in Amsterdam, it was concluded that two-thirds preferred herbal cannabis to cannabis resin (Korf et al., 2002).

Today, herbal cannabis is the product sold most often in coffee shops. Mostly this is so-called 'nederwiet', or home-grown herbal cannabis. In practice, this kind of herbal cannabis is grown indoors and only a small proportion is imported herb grown outdoors. Most cannabis resin is imported, predominantly from Morocco (see Gamella, this monograph) and only a very small proportion of the resin sold in coffee shops stems from indoor cultivation in the Netherlands.

The THC content of cannabis as sold in coffee shops in the Netherlands has been systematically monitored by the Trimbos Institute since 1999. It might be debated to what extent these figures are correct as there is dispute among researchers over what is the most appropriate method to measure THC concentrations (King et al., 2005), and perhaps the Dutch method generates relatively high concentrations. Nevertheless, while consistently applying the same laboratory techniques, the monitoring system is an adequate instrument to analyse trends in purity over time. THC concentrations in sold 'nederwiet' more than doubled between 1999–2000 and 2003–2004, from an average of 8.6% to 20.4%. In 2004–2005 the average concentration dropped to 17.7%, and 17.5% in 2005–2006, which was comparable to 2002–2003. Imported hashish showed an increase in THC concentration from 11–12% in the first two years to 17–18% in 2002, and then remained stable. THC concentrations in imported herbal cannabis remained quite stable at around 6% (Pijlman et al., 2005; Niesink et al., 2006).

The supply of coffee shops is commonly known in the Netherlands as 'the back door', even though in reality both suppliers and customers use the same door to enter the coffee shop. While the sale of cannabis to consumers is tolerated in coffee shops, the supply remains illegal and is subject to law enforcement. Although a maximum of 500 grams 'in stock' is tolerated, coffee shops can still be prosecuted for sourcing the cannabis into their locality. Moreover, cultivation of five plants or more per person is

illegal. Police and the judicial authorities have increased their actions against herbal cannabis growers. Between 2000 and 2003, the number of cases brought to the public prosecutor for cannabis offences increased by more than 40% (from 4 324 to 6 156). A growing number of cannabis plantations have been raided and in both 2005 and 2006 approximately 6 000 herbal cannabis cultivation sites were dismantled, and about 2.5 million plants confiscated and destroyed per year (Wouters et al., 2007).

When the Dutch authorities decided to decriminalise cannabis and to tolerate the retail sale of cannabis to consumers, they did not, and probably could not, envision that this would lead to the coffee shop phenomenon. The strong growth of the number of coffee shops — that were never intended to exist — meant that the authorities were confronted with a new problem. In order to cap this growth, the national government decided to give local communities legal instruments to regulate the number of coffee shops, including the option to not allow coffee shops at all. Regarding the supply side of the cannabis market, enforcement has focused on large-scale dealers. Interestingly, herbal cannabis has taken over from the once-dominant resin. While cannabis resin typically was, and still is, imported, herbal cannabis is today mostly domestically cultivated. Consequently, a shift in law enforcement can be perceived from controlling import to controlling cultivation within the country itself (Decorte and Boekhout van Solinge, 2006).

While finalising this paper, two options for regulating the supply of coffee shops have been debated in the Netherlands. On the one hand, at a national level the Ministry of Justice of the previous government was a strong advocate of persistent repression of the illegal cultivation of cannabis in the Netherlands. On the other hand, a growing number of communities with coffee shops, as well as a majority in the Dutch parliament, have pleaded to take a further step towards decriminalisation by regulating the back door problem. From their perspective, the fight against international traffickers should be continued and intensified, while supply for the national market should become less profitable for criminals by allowing the cultivation of herbal cannabis under strict conditions for coffee shops only. Just before Christmas 2005, the Ministry of Justice gave up its resistance and declared to no longer block an experiment with regulated cultivation of herbal cannabis. With the new national government, installed early in 2007, the future of the supply of coffee shops is an open question.

Recent developments

In 2007, the national guideline that coffee shops are not allowed to sell alcohol has finally been implemented in Amsterdam. As a result, most of the approximately 40 coffee shops in Amsterdam that were also serving alcohol, have decided to stop selling cannabis and consequently lost their coffee shop licence.

Also, there is a trend to be more strict on allowing coffee shops in the proximity of schools. The city council of Rotterdam has been the first to decide to close down approximately 27 of a total of 62 coffee shops, mostly in the inner city. It is to be expected that coffee shop owners will continue to protest in the courts against this decision, in particular because the city of Rotterdam has declared that the coffee shops to be closed will neither receive any financial compensation, nor be given a licence for a coffee shop elsewhere in Rotterdam.

As part of the plans of the national government to ban tobacco smoking from restaurants and cafes in 2008, a vivid discussion continues on the question of whether coffee shops should become totally smoke-free, be allowed to have a separate smoking facility, or will be exempt from the general anti-smoking policy.

References

- Abraham, M., Cohen, P., van Til, R. et al. (1999), *Licit and illicit drug use in the Netherlands, 1997*, Centre for Drug Research (CEDRO), Amsterdam.
- Abraham, M., Kaal, H., Cohen, P. (2002), *Licit and illicit drug use in the Netherlands, 2001*, CEDRO/Mets., Amsterdam.
- Abraham, M., Kaal, H., Cohen, P. (2003), *Licit and illicit drug use in Amsterdam, 1987 to 2001*. CEDRO/Mets., Amsterdam.
- Bieleman, B., Goeree, P. (2000), *Coffeeshops geteld; Aantallen verkooppunten van cannabis in Nederland* (Coffee shops counted. The number of cannabis selling coffee shops in the Netherlands), IntraVal, Groningen.
- Bieleman, B., Goeree, P., Naayer, H. (2005), *Aantallen coffeeshops en gemeentelijk beleid 1999–2004: coffeeshops in Nederland 2004*, Ministerie van Justitie, IntraVal-WODC, Groningen.
- Boekhoorn, P., van Dijk, A., Loef, C., van Oosten, R., Steinmetz, C. (1995), *Softdrugs in Nederland, consumptie en handel*, Steinmetz, Amsterdam.
- Cohen, H. (1975), *Drugs, druggebruikers en drugscene*, Samson, Alphen aan den Rijn.
- Cohen, P., Sas, A. (1998), *Cannabis use in Amsterdam*, Cedro, Amsterdam.
- Decorte, T., Boekhout van Solinge, T. (2006), 'Het aanbod van cannabis in Nederland en België' [Cannabis supply in the Netherlands and Belgium], *Tijdschrift voor Criminologie* 2006 (48) 2 ('themanummer Drugs en drughandel in Nederland en België'), 144–154.
- EMCDDA (2001), *Annual report on the state of the drugs problem in the European Union*, European Monitoring Centre for Drugs and Drug Addiction, Lisbon.
- EMCDDA (2001), *ELDD: legal status of cannabis: situation in the EU Member States*, European Monitoring Centre for Drugs and Drug Addiction, Lisbon.
- Harrison, L. (1997) 'More cannabis in Europe? Perspectives from the USA', in: Korf, D. and Riper, H. (eds.) *Illicit drugs in Europe. Proceedings of the seventh annual conference on drug use and drug policy in Europe*, Siswo, Amsterdam.
- Jansen, A. (1991), *Cannabis in Amsterdam. A geography of hashish and marihuana*, Coutinho, Muiderberg.
- Kilmer, B. (2002), 'Do cannabis possession laws influence cannabis use?', Paper presented at the International Scientific Conference on Cannabis, Rodin Foundation, 25 February, Brussels.
- King, L., Carpentier, C., Griffiths, P. (2005), 'Cannabis potency in Europe', *Addiction* 100(7): 884–886.
- Korf, D. (1995), *Dutch treat. Formal control and illicit drug use in the Netherlands*, Thela Thesis, Amsterdam.

- Korf, D., van der Woude, M., Benschop, A., Nabben, T. (2001), *Coffeeshops, jeugd en toerisme*, Rozenberg, Amsterdam.
- Korf, D., Nabben, T., Benschop, A. (2002), *Antenne 2001. Trends in alcohol, tabak en drugs bij jonge Amsterdammers*, Rozenberg Publishers, Amsterdam.
- Korf, D., Wouters, M., Nabben, T., van Ginkel, P. (2004), *Cannabis zonder coffeeshop*, Rozenberg, Amsterdam.
- de Kort, M., Korf, D. (1992), 'The development of drug trade and drug control in the Netherlands: a historical perspective', *Crime, Law and Social Change* 17: 123–144.
- Kraus, L. (1997), 'Prävalenzschätzungen zum Konsum illegare Drogen in Europa' (Prevalence estimates of illicit drug use in Europe), *Sucht* 43 (5): 329–341.
- Kraus, L., Bauernfeind, R. (1998), 'Repräsentativerhebung zum Gebrauch psychoaktiver Substanzen bei Erwachsenen in Deutschland 1997' (Population survey on the consumption of psychoactive substances in the German adult population 1997), *Sucht* 44 (Sonderheft 1).
- Kraus, L., Bauernfeind, R., Bühringer, G. (1998), *Epidemiologie des Drogenkonsums. Ergebnisse aus Bevölkerungssurveys 1990 bis 1996* (Epidemiology of drug use. Findings from population surveys 1990–1996), Nomos, Baden-Baden.
- Leroy, B. (1992), 'The European Community of twelve and the drug demand. Excerpt of a comparative study of legislations and judicial practice', *Drug and Alcohol Dependence* 29: 269–281.
- Leuw, E. (1973), 'Druggebruik in het Vondelpark 1972' (Drug use in the Vondelpark 1972), *Nederlands Tijdschrift voor Criminologie* 15: 202–218.
- MacCoun, R., Reuter, P. (1997), 'Interpreting Dutch cannabis policy: reasoning by analogy in the legalization debate', *Science* 278: 47–52.
- Monshouwer, K., van Dorsslelaer, S., Gorter, A., Verdurmen, J., Vollebergh, W. (2004), *Jeugd en riskant gedrag*, Trimbos Institute, Utrecht.
- Musto, D. F. (1987) *The American disease. Origins of narcotic control*. Oxford University Press, New York/Oxford.
- Nationale Drug Monitor (NDM) (2006), *Jaarbericht 2006*, Trimbos Instituut, Utrecht.
- Niesink, R., Rigter, S., Hoek, J., Goldschmidt, H. (2006), *THC-concentraties in wiet, nederwiet and hasj in Nederlandse coffee shops (2005–2006)* (THC-concentrations in cannabis preparations sold in Dutch coffee shops), Trimbos Institute, Utrecht.
- Partanen, J., Metso, L. (1999), 'Suomen toinen huumeaalto' (The second Finnish drug wave), *Yhteiskuntapolitiikka* 2, Helsinki.
- Pijlman, F., Rigter, S., Hoek, J., Goldschmidt, H., Niesink, R. (2005), 'Strong increase in total delta-THC in cannabis preparations sold in Dutch coffee shops', *Addiction Biology* 10 (2): 171–180.
- Plomp, H., Kuipers, H., van Oers, M. (1990), *Roken, alcohol- en drugsgebruik onder scholieren vanaf 10 jaar* (Smoking, alcohol and drug use among students aged 10 years and older), VU University Press, Amsterdam.
- Ramsay, M., Partridge, S. (1999), *Drug misuse declared in 1998: results from the British Crime Survey*, Home Office, London.
- Reuband, K. (1992), *Drogenpolitik und Drogenkonsum. Deutschland und die Niederlande im Vergleich* (Drug policy and drug use. A comparison of Germany and the Netherlands), Leske and Budrich, Opladen.
- Reuband, K. (1995), 'Drug use and drug policy in Western Europe. Epidemiological findings in a comparative perspective', *European Addiction Research* 1 (1–2): 32–41.
- Rodenburg, G., Spijkerman, R., van den Eijnden, R., van de Mheen, D. (2007), *Nationaal prevalentie onderzoek middelengebruik 2005*, IVO, Rotterdam.
- SAMHSA (2000), *Summary of findings from the 1999 National Household Survey on Drug Abuse*, Substance Abuse and Mental Health Services Administration, Rockville.
- Wouters, M., Korf, D., Kroeske, B. (2007), *Harde aanpak, hete zomer. Een onderzoek naar de ontmanteling van hennepkwekerijen in Nederland*, Rozenberg, Amsterdam.

Chapter 10

Cannabis policy: tightening the ties in Denmark

Keywords: cannabis – crackdown – enforcement – Christiania – Copenhagen – Denmark – legislation – protest and reform movements

Setting the context

Several chapters in this monograph have touched on the link between cannabis culture and social movements of the 1960s and 1970s. One of the remnants of this period is the alternative district of Christiania in Copenhagen, Denmark, recently described by *Time-Life* magazine as ‘Europe’s last commune’.

One of the features of Christiania was an open cannabis market known as *Pusher Street*. This chapter describes the events preceding and following the closure of Pusher Street in March 2004. The clashes between police and residents described here were more recently echoed in a series of incidents in May 2007, which again brought Christiania into the international limelight.

So how does Denmark look in terms of cannabis (1)? It has the highest reported lifetime prevalence of cannabis in the EU, at 31.3% of the adult population (EMCDDA, 2005) and although recent use is also relatively high, with 20% of 16- to 24-year-olds reported to have used cannabis in the last month (EMCDDA Danish Focal Point, 2004), it is not exceptionally high.

This chapter is written from a liberal perspective. Its arguments serve to illustrate the resistance law enforcement can face in any attempt to break from established tolerance. The chapter documents the considerable efforts made to close down a long-established drug market. These efforts were ultimately successful, although the author’s view

(1) General information and analysis about the Danish drugs situation is compiled each year by the EMCDDA’s national focal point in its national report and country situation summary. See www.emcdda.europa.eu/index.cfm?nNodelD=435

suggests that they may have been heavy-handed and not delivered the benefits intended in reducing cannabis use.

Others might take a different perspective. It could equally be argued that the authorities had demonstrated that public drug dealing was an unacceptable behaviour which would not be tolerated and that firm action could be effective. The extent to which longer term use of cannabis is influenced by police action is more difficult to assess. This debate is still ongoing and will not be resolved here. Nonetheless, enforcement clampdowns can be seen as a visible declaration that use of a drug is not socially condoned. Such 'denormalisation' may have an impact in the longer term on the attitudes of young people to drug-taking.

Ongoing reporting of cannabis use in Denmark will tell us how current Danish drug strategy is affecting cannabis use and drug prevalence in general. This chapter makes interesting reading as it details the concerted efforts made to close down Pusher Street. Developments in Copenhagen underline the conclusion drawn by Ballotta et al. earlier. Although public perception is that attitudes to cannabis are becoming more liberal in Europe, there are plenty of examples where a tougher approach is observable.

Further reading

- Anker, J., Asmussen, V., Kouvonon, P., Tops, D. (eds) (2006), *Drug users and spaces for legitimate action*, Nordic Council for Alcohol and Drug Research, Helsinki.
- Danish National Focal Point (2006, 2007), *National report Denmark*, European Monitoring Centre for Drugs and Drug Addiction, Lisbon. Note: *National reports* are published annually in November.
- Hakkarainen, P., Tigerstedt, C., Storgaard, L. (eds) (1996), *Discussing drugs and control policy: comparative studies on four Nordic Countries*, Nordic Council for Alcohol and Drug Research, Helsinki.
- Pernille, W. Lauritsen (2002), *Christiania — kort fortalt: guide og historie* [Christiania — a short story, guide and history], Aschehoug, Copenhagen.

Cannabis policy: tightening the ties in Denmark

Vibeke Asmussen

General background

Christiania

The self-declared free state of Christiania was set up by activists in 1971. It occupies 34 hectares of military property in central Copenhagen. In 2004, Christiania had a population estimated at between 850 and 1 000 out of a population of over 500 000 in central Copenhagen. An eviction ruling from 1976 has never been enforced, enabling Christiania to develop over 30 years as a centre for alternative culture, crafts and art. As a rare survivor of hippie utopian culture — *Time* magazine recently called it ‘Europe’s last commune’ ⁽²⁾ — it has long played a role as great divider in Danish politics, simultaneously lauded by the left and damned by the right. Current developments in the late 2000s suggest that the free state’s days may be numbered: negotiations between Christiania and the government on its future status have been going on for the past three years (Asmussen, 2007).

Pusher Street

Parallel to its free state ideals, Christiania developed a lucrative criminal sideline, *Pusher Street*, which its website calls a ‘multi-million business’ ⁽³⁾ for drugs. In 2004, the cannabis market included about 40 street stalls, attracting both a domestic clientele and cross-border drugs tourists, particularly from Sweden. Clients could openly buy drugs to take away, or could smoke ‘in situ’ in the street or in Christiania’s bars and cafés.

Although ‘hard drug’ sales were voluntarily banned from 1980, a 6 May 2003 report on Christiania by the Minister of Justice and the Minister of Defence documented links with organised crime and biker gangs. It also reported a ‘spillover’ effect of hard drugs being sold on the periphery of Christiania, if not actually within it ⁽⁴⁾ (EMCDDA Reitox Danish Focal Point Report, 2004). Regular police drugs seizures — not to mention the contested estimate of 20 kg per day, discussed below — suggest a high revenue business

⁽²⁾ Christopher Thompson, ‘Europe’s last commune braces for battle’, *Time* magazine, 23 July 2007. Available at: www.time.com/time/world/article/0,8599,1637000,00.html

⁽³⁾ www.christiania.org, accessed February 2007.

⁽⁴⁾ On 24 April 2005 a shootout among cannabis gangs left one dead and three injured.

with efficient logistics, where daily deliveries were made to the point-of-sale. Moreover, experience with arrests of dealers over two decades revealed Pusher Street's resilience to controls: points-of-sale were restaffed and replenished within hours of police action. The May 2003 report concluded that extraordinarily high police resources, most likely for a sustained duration, were needed.

While for many years Pusher Street was effectively a no-go area for uniformed police patrol routines, surveillance and arrests in the area intensified throughout the early 2000s as the Ministry of Justice and the Copenhagen Metropolitan Police Force sought to 'normalise' conditions for drug dealers in line with the rest of the city (EMCDDA Danish Focal Point, 2004). Increased policing of Christiania was accompanied by the nationwide tightening in 2004 of legislative controls over cannabis in Denmark, aimed at curbing both dealing and personal possession of cannabis (EMCDDA ELDD, 2006).

The culmination of police actions in Pusher Street was the March 2004 operation to 'close' the market and arrest its dealers. This chapter describes the nature of the police action in March 2004, together with the judicial process and convictions that followed it, as reported in the Danish press ⁽⁵⁾. It also discusses the political background to the government's official policy on drugs, launched in 2003, *The Fight against Drugs*.

Danish drug policy 2001–2005: legal tightening

In the course of the 2000s, Denmark has experienced a tightening in drug policy — and cannabis policy in particular — from a liberal to a relatively repressive regime.

2001's *Law Prohibiting Visitors to Designated Places* (popularly called 'the Hash-Club Law') was proposed as a response to a moral panic about youths frequenting underground 'hash clubs' ⁽⁶⁾ (Asmussen and Moesby-Johansen, 2004). The new law enabled police to clamp down on hash clubs, and has since been reinterpreted in 2005 to make it even easier to close down hash clubs. The number of offences that the police needed in order to close a hash club was reduced from 10–15 to 3–5.

2004's *Law on Euphoria-inducing Substances* was revised to criminalise possession of cannabis. While possession of less than 10 grams of cannabis was not prosecuted

⁽⁵⁾ Descriptions of the arrests, trials and sentences are based on a corpus of newspaper articles published between March 2004 and July 2005 in three Danish newspapers: *Jyllands-Posten*, *Berlingske Tidende* and *Politiken*. A second source of information — a description of the sentences handed out — is taken from the Copenhagen City Court's website (www.domstol.dk/). For a detailed description of the closure of Pusher Street, see Asmussen, 2007.

⁽⁶⁾ Hash clubs are illicit speakeasies at private addresses where cannabis can be bought. The hash club law states that an apartment's inhabitant can be forbidden to receive visitors if he or she is known 'to practice a systematically illegal business which can disturb and endanger his neighbours'.

before the revision, it is now punished with the minimum of a fine. It is thus illegal to possess any amount of drugs, cannabis included, in Denmark. At the same time, another part of the Law on Euphoria-inducing Substances was revised. Penalties were increased from a fine to a prison term 'if drug dealing is performed with children and young people under the age of 18 years' at discos, clubs or music festivals.

Also in 2004, prison sentences for drug crimes were raised during revisions to *The Prison Law*. The maximum prison sentences for drug crimes were raised from 6 to 10 years, for serious drug crimes (trafficking and dealing) from 10 to 16 years, with even sentences of up to 24 years for particularly serious drug crimes (Storgaard, 2005).

The swing towards repression is not an entirely new phenomenon (?). Storgaard (2005) argues that drugs policy — about different control policies for users versus dealers, 'soft' drugs versus 'hard' drugs, etc. — has been a permanent parliamentary battlefield in Denmark over the last 30 years, with the liberal-conservative and the centre-left wing, headed by the Social Democratic Party, in opposing camps (Storgaard, 2005). The centre-left's position dominated Danish drug policy until 2001. For example, from 1969 to 2004 possession of up to 10 grams of cannabis for personal use was not prosecuted, and onus was placed on combating hard drugs and organised crime, with a blind eye being turned towards small-scale cannabis sales (Grytnes, 2003).

Since the liberal-conservative government came into power in 2001, its self-styled 'zero-tolerance' policy has been to tighten the legal control of drug crimes and to raise the penalties for drug offences, while also increasing access to treatment, particularly in prisons. Moreover, its action plan, *The Fight against Drugs*, explicitly removes the distinction between seller and buyer, stating that the drug policy targets both supply and demand side, drug dealers and drug users (Danish Government, 2003). The action plan also prioritises actions that protect youths from drug misuse.

Party political divides should also be placed in the context of growing responsiveness to media 'hot button' issues, with drugs suffering both negative connotations on one hand and a stranglehold on headlines on the other (Christie and Bruun, 1985). Thus, the first new legal instrument, the Hash Club Law, was as much the work of the former social democratic government as of the new liberal-conservative government. Moreover, at the same time that laws were tightened, liberalising proposals by the centre-left opposition — respectively to decriminalise cannabis on almost the same terms as the Netherlands, to implement safe injection rooms, and to implement heroin trials — were all overturned, suggesting a general hostile climate towards liberalisation.

(?) On the Danish drug policy combating hard drugs in the 1990s and the effects it had on hard drug users see, for example Frantszen (2003) and Laursen and Jepsen (2002).

So what does this legal tightening mean in practice? First, the former differentiation between users and dealers, 'soft' drugs and 'hard' drugs is no longer the heart of Danish drug policy. Use of any drug is perceived as drug misuse, and in particular, use of cannabis is now criminalised. This effectively brings the appreciable numbers of cannabis consumers in Denmark within reach of prosecution (EMCDDA Danish Focal Point, 2005; Storgaard, 2005).

Another aspect of these changes is the concern for young people. On the one hand, adolescent drug users have been criminalised by the legislation covering possession of cannabis for personal use. On the other hand, they are protected by the revision of drug dealing to young people and the closure of illicit dealing premises under the Hash Club Law (Asmussen and Moesby-Johansen, 2004).

Finally, sentences for drug crimes have been raised and can be compared to sentences for manslaughter and homicide. The former focus in Danish drug policy on organised crime is now also widened and includes 'zero tolerance' towards all kinds of dealers. It is this last change which provided the leverage to police to tackle the long-standing quandary of Pusher Street.

The Pusher Street raid: 50 cannabis dealers and security guards arrested

The date 16 March 2004 represents a milestone in Danish drug policy. At 5 am police action to close down Pusher Street began. Bulldozers and several hundred armed police officers entered Christiania and removed the small wooden, zinc-roofed stalls where cannabis was sold (Asmussen, 2007). Simultaneously, over 50 cannabis dealers and security guards were arrested in different locations in Copenhagen and remanded in custody. Major police actions had occurred in Christiania before, as Laursen (1996) and the EMCDDA Danish Focal Point (2005) point out, but this was the first time that a police action was planned so thoroughly with the aim to actually close down Pusher Street. This was also the first time so many dealers (and security guards) were arrested simultaneously.

Surveillance of Pusher Street was carried out by police between October 2003 and March 2004, involving videotaping of Pusher Street and the tapping of radio communication and phone calls. Tapped phone calls and radio communications were especially important in enabling the police to charge people for being members of, or employed by, a private security force that warned the dealers and customers about police activity. This security force was dubbed *Christiania's Intelligence Service* by the police, and it represented a key argument for the police, the judges, and prosecutors in categorising Pusher Street as 'well organised'. The police claimed the security force was regimented into six posts in different parts of Christiania from where guards could

warn dealers if the police were approaching. Police argued that the guards worked in shifts from these posts and communicated via radio and cell phones, substantiating claims with both tapped phone calls and radio communications between the guards and with a duty roster found in one of the managers' houses. The duty roster consisted of initials of the guards, their phone numbers and a list of day and evening shifts. The police also worked as undercover agents, buying cannabis at the stalls in Pusher Street. Swedish and Norwegian policemen were used together with the Danish police. Using undercover police as a method of investigation is exceptional in Danish police work and requires court permission. With the videotapes and the undercover police work the police systematically registered the dealers that operated from the different stalls. It was on the basis of the videotapes and the undercover police work that the police estimated that about 3.6 tonnes of cannabis was sold in Pusher Street during the six months of surveillance. The amount was, however, disputed by the defence lawyers as well as by the defendants, and the judges later found these calculations too uncertain.

The pre-trial detention

The dealers and security guards arrested on 16 March were remanded in custody in solitary confinement by the City Court of Copenhagen. The pre-trial detention was prolonged multiple times on the grounds that the police needed time to investigate and prepare the trials. A few were released after two months, but about 40 of the defendants spent three months in solitary confinement, the legal upper limit for solitary confinement in Denmark. At the same time, the pre-trial procedures were held behind closed doors on account of police investigations. In July several of the dealers were discharged, but during the summer and autumn of 2004 the City Court continued to prolong pre-trial detention, three to four weeks at a time, with the security guards in particular having their custody prolonged. Five months after 16 March, 36 defendants were still in custody. On several occasions when a defendant was discharged by the City Court the prosecutor immediately appealed to the High Court, who on all occasions decided to confirm the prolonged pre-trial detentions. The defence attorneys protested each time the City Court prolonged the pre-trial detentions, and called into question the closed doors at the pre-trial procedures.

Since the court meetings were held behind closed doors the detailed arguments behind the prolongations were kept secret from the public. The only reason given was that the defendants could jeopardise the police investigations as well as the presumed risk that the defendants would take up their criminal activities again, that is, dealing cannabis, and this risk was considered especially high since they were 'well organised'.

In the beginning of September one of the defence lawyers received permission from the Danish Board of Appeal Permission to try one of the cases with the long pre-trial detentions in the Supreme Court. In late November the Supreme Court confirmed

the decision made by the High Court that the defendants should continue to be in custody. The reason given was, again, that the cannabis sale had been extensive and well organised, which was reason enough to keep them in custody. Therefore, in late November 2004, 36 of the initial 50 defendants were still in custody. They had at that time been in custody for almost nine months. Media reports mentioned two of the defendants in custody that were affected by illness. One suffered from claustrophobia, the other had gained 23 kg, and as a consequence suffered repeatedly from thrombosis in his legs. These cases were reported in the news because their defence lawyer complained about the defendants being in custody while suffering different forms of illnesses. The City Court in Copenhagen discharged the two defendants, but the prosecutor appealed to the High Court. Here, one was discharged, the other one who suffered from claustrophobia was moved to a larger cell and maintained in custody.

The charges

The defendants were charged as dealers or as security guards. The dealers were charged with extensive cannabis dealing from stalls in Pusher Street and for having sold between 25 and 150 kg of cannabis in the period the police held Pusher Street under surveillance. The amount that each individual dealer was charged with was based on calculations made from the surveillance and the undercover police work. The dealers were 'and could only be' charged for the amount of cannabis they had sold themselves, that is, for specific dealing. Thirty of the defendants were charged as dealers, and some were facing up to three-and-a-half years of imprisonment.

The security guards did not sell cannabis themselves but secured that all the dealers could run their business, and were therefore charged for complicity. The police calculated that 20 kg of cannabis was sold every day in Pusher Street and multiplied this by the days the police monitored Pusher Street, resulting in total sales of several tonnes of cannabis. Since the guards worked on a structured duty roster in day and evening shifts, they could be charged collectively, and thus faced up to four years' imprisonment.

This was the first time in Denmark that persons were charged collectively for drug crimes. The police claimed that the security force during the preceding years had developed from individual persons warning cannabis dealers with whistles if the police were in the neighbourhood, to a structured force with duty rosters, managers organising the shifts, and payment by the dealers, thus making guarding a lucrative business. The defendants themselves, however, described themselves as a kind of 'buffer' between the police and the dealers in Christiania, ensuring that any trouble accompanying police presence in Christiania did not escalate. They also claimed that they ensured hard drugs or biker gang members did not appear in Christiania. This was highlighted by the defence lawyers, who also denied the existence of a formal Christiania Intelligence Service.

The trials and sentences

At the end of August 2004 the first trial began. Two dealers — a stallkeeper and a helper — were charged with having sold 114 and 30 kg of cannabis respectively. However, the sentences that the two dealers received in December only convicted them for selling 25 and 10 kg of cannabis respectively, with accompanying prison sentences of one-and-a-half years and one year. The method of calculation that the police had used was accepted by the judges, but only in part: they accepted what was to be seen on the videotapes and the testimonies from the undercover policemen, but in general the means of calculating what was sold from the stalls in the whole period was deemed too uncertain. After this first trial, 10 of the defendants that were charged with having sold less than 40 kg of cannabis were released from custody by the City Court on the account that the sentence would no longer be equivalent with the pre-trial detention.

Throughout December 2004 and January 2005 the rest of the dealers were convicted. However, it was not until the end of May 2005 that the last trial ended. The dealers were all convicted for having sold less cannabis than they were charged with. They received sentences of between 30 days and 2 years and 6 months. In total, the convicted dealers got 35 years of imprisonment. Only one defendant was found not guilty.

The joint trial against the security guards began in May 2005. Seventeen persons were charged for being security guards in the Christiania Intelligence Service and three were charged for being managers of the service. The latter organised the shifts, supervised the security guards and collected money from the cannabis dealers. All the defendants pleaded not guilty to the charges. Based on tapped phone calls and radio communication between the guards and the three managers, the City Court found all guards, but only two of the three managers guilty. The two managers received a two-and-a-half years prison sentence each. The security guards got a sentence between one and two-and-a-half years, depending on how long they had been employed in the security force. In total, the 19 defendants received 34 years of imprisonment.

Concluding remarks

This report of the arrested dealers and security guards illustrates how the Danish government's 'zero-tolerance' drugs policy is implemented in practice. The closure of Pusher Street was clearly a 'show of strength', as seen in the Ministry of Justice and Ministry of Defence report submitted in 2003, detailed planning by police, the use of undercover agents, the simultaneous arrest of so many dealers and security guards, the involvement of detectives from Norway and Sweden, etc. Also unusual was the use of the upper level of solitary confinement (three months), as well as of extremely long pre-trial detentions (up to 10 months) for what in effect was retail street dealing rather than wholesale trafficking of drugs.

In terms of police success, the convictions could be viewed as a mixed bag. Many of the dealer defendants were discharged after sentence for time served in pre-trial custody, with none being convicted of selling the full volume of cannabis claimed by police. Conversely, the collective charging of the security guards resulted in all but one being found guilty as charged. This latter result highlights the extension of Danish drug legislation beyond dealers towards those aiding and abetting drug sales, and the lowering of the threshold for what is considered 'organised' and 'well organised' drug crime.

One can question the rationale behind the sudden departure from the 'blind eye' that was turned to cannabis dealing for about 30 years in Pusher Street. Nothing indicates that cannabis dealing had changed or increased in years preceding before the closure of Pusher Street. Moreover, when denying the existence of the *Christiania Intelligence Service* the defence lawyers pointed to the self-regulation within Christiania with regard to hard drugs, even the cooperation of individuals as mediators during any confrontations between police and dealers. The clampdown must therefore be viewed as a political and 'moral' change in attitude rather than a change in cannabis dealing practice.

The most important question is, what effect did closing Pusher Street have? Not much, it seems. Cannabis dealing is still carried out in Christiania, according to the police as well as personal observation. However, cannabis dealing no longer occurs in public from small stalls in Pusher Street, but more discreetly from person to person. In Copenhagen in general there is also just as much cannabis circulating, both according to the police and the Municipality of Copenhagen. However, the market has dispersed into many different and new areas, with some anxiety that cannabis is now even more easily available to young people (Asmussen, 2007).

So, the recent change in Danish drug policy seems to follow what scholars on drug policy like Kilmer (2002) and Korf (2002) in general argue: drug policy, whether repressive or liberal, does not influence either a decrease or an increase of cannabis use. The closure of Pusher Street is more an example of how a government pursues a 'zero tolerance' policy rather than a serious attempt to solve drug problems. Seen in the context of the gradual dismantling of the Christiania commune, it can also be viewed as a moral rejection of *laissez-faire*.

References

- Asmussen, V. (2007), 'Danish cannabis policy in practice: the closing of Pusher Street and the cannabis market in Copenhagen', in Fountain, J., Korf, D. (eds) (2007), *Drugs in society: European perspectives*, Radcliffe Publishing, Abingdon.
- Asmussen, V., Moesby-Johansen, C. (2004), 'The legal response to illegal "hash clubs" in Denmark', in Decorte, T., Korf, D. (eds), *European studies on drugs and drug policy*, VUB Press, Brussels, 75–98.
- Christie, N., Bruun, K. (1985), *Den Gode Fiende. Narkotikapolitikk i Norden*, Universitetsforlaget, Oslo.
- Danish Government (2003), *Kampen mod narko — handlingsplan mod narkotikamisbrug [The Fight against Drugs — Action Plan against Drug Misuse]*, Indenrigs- og Sundhedsministeriet, Copenhagen www.im.dk/imagesupload/dokument/Kampen_mod_narko.pdf
- EMCDDA Reitox Danish Focal Point (2004), *National report 2003 [Narkotikasituation i Danmark]*, Sundhedsstyrelsen, Copenhagen www.emcdda.europa.eu/index.cfm?nNodeID=435
- EMCDDA Reitox Danish Focal Point (2005), *National report 2004 [Narkotikasituation i Danmark]*, Sundhedsstyrelsen, Copenhagen www.emcdda.europa.eu/index.cfm?nNodeID=435
- EMCDDA Reitox Danish Focal Point (2006), *National report 2005 [Narkotikasituation i Danmark]*, Sundhedsstyrelsen, Copenhagen www.emcdda.europa.eu/index.cfm?nNodeID=435
- EMCDDA ELDD (2006) <http://eldd.emcdda.europa.eu>
- Frantszen, E. (2003), 'Drug enforcement in Copenhagen: negotiating space', in Houborg Pedersen, E., Tigerstedt, C. (eds), *Regulating drugs – between users, the police and social workers*, NAD Publications 43, Helsinki, 75–84.
- Grytnes, R. (2003), 'Policing a drug scene – strategies, practices and dilemmas', in Houborg Pedersen, E., Tigerstedt, C. (eds), *Regulating drugs – between users, the police and social workers*, NAD Publications no. 43, Helsinki, 85–100.
- Kilmer, B. (2002), 'Do cannabis possession laws influence cannabis use?', in *Cannabis 2002 Report, Technical Report of the International Scientific Conference Brussels*, Brussels, 101–123.
- Korf, D. (2002), 'Dutch coffee shops and trends in cannabis use', *Addictive Behaviours* 27: 851–866.
- Laursen, L. (1996), 'Scandinavia's tug of war on drugs', in Hakkarainen, P., Laursen, L., Tigerstedt, C. (eds), *Discussing drugs and control policy. Comparative studies on four Nordic countries*, NAD Publications 31, Helsinki, 33–82.
- Laursen, L., Jepsen, J. (2002), 'Danish drug policy — an ambivalent balance between repression and welfare', *The Annals of the American Academy of Political and Social Science* 582: 20–36.
- Storgaard Laursen, L. (2005), 'Trends in cannabis use and changes in cannabis policy in Denmark', in Kraus, L., Korf, D. J. (eds), *Research on Drugs and Drug Policy from a European Perspective*, Pabst Science Publishers, Lengerich, 35–47.

Danish legal texts

- Law prohibiting visitors to designated places (Act no. 471 of 7 June 2001).
- Law on euphoria-inducing substances (Act no. 445 of 9 June 2004).
- The prison law (Act no. 445 of 9 June 2004).
- All of the above are available at: www.retsinfo.dk

Websites

Christiania

www.christiania.org

The Courts of Denmark

www.domstol.dk

EMCDDA

www.emcdda.europa.eu

Official online register of Danish legislation

www.retsinfo.dk

Chapter 11

Cannabis: a harm reduction perspective

Keywords: cannabis – education – harm reduction – information – vaporisers

Setting the context

‘Harm reduction’ means many things to many people. A useful and concise definition is provided by the UN’s Glossary of Terms on Demand Reduction ⁽¹⁾, which mentions ‘policies or programmes that focus on reducing the harm resulting from the use of alcohol or other drugs, both to the individual and larger community (...) without necessarily requiring abstinence’. The definition clarifies that harm reduction may ‘precede subsequent efforts to achieve total abstinence’ and ‘is neutral regarding the wisdom or morality of continued drug use and should not be synonymous with moves to legalize, decriminalize or promote drug use’.

With regard to cannabis, harm reduction is more difficult to define than, say, programmes to reduce needle injuries, hepatitis and HIV transmission among heroin users. One problem is that harm reduction for cannabis is often a bottom-up phenomenon that is delivered via unofficial rather than governmental or central sources, for example, cannabis magazines, websites and headshops. Harm reduction is also transferred via word of mouth. Long before a user comes into contact with a drugs professional, information will be delivered by dealers, fellow cannabis users, peers and siblings.

Among the more formal harm reduction programmes, there is considerable overlap across harm reduction, prevention and early treatment interventions. For example, low threshold interventions such as drugs helplines, the Jellinek self-screening test and French cannabisetconduite.fr campaign (see Burkhart, and Beck and Legleye,

⁽¹⁾ UNODCCP (2000), *Demand reduction: a glossary of terms*, UNODCCP, Vienna. Available at: www.unodc.org/pdf/report_2000-11-30_1.pdf

this monograph) could be loosely defined as harm reduction initiatives. Although the nature of harm reduction programmes varies greatly across the EU, many programmes borrow from the fields of alcohol and tobacco. Actions include advice on safer modes of administration (e.g. on the use of vaporisers, on rolling safer joints, on less risky modes of inhaling); skills to prevent confrontation with those who disapprove of use; encouraging users to moderate their use; discouraging mixing cannabis with other drugs; drug driving prevention and controls; reducing third-party exposure to second-hand smoke; education about spotting signs of problematic use; and self-screening for problematic use.

First and foremost, harm reduction centres on helping users to make informed decisions with information that is understandable, accurate and non-judgemental. For example, a recent initiative, the Evidence-based Electronic Library for Drugs and Addiction (EELDA) ⁽²⁾, attempts to filter the huge body of scientific literature on cannabis, cocaine and ecstasy into a more accessible format using relatively simple language. It includes discussion of the risks of cannabis use as it relates to medical conditions (while pregnant, if epileptic, if suffering from liver, lung or heart problems) and to specific use settings (at work, when driving).

This chapter focuses on specific work on harm reduction at the HIT project in the United Kingdom. Its discussion of the need to communicate effectively, to empathise with cannabis users and to understand the motivations for using cannabis will be relevant to drugs practitioners everywhere.

Further reading

- Grotenhermen, F. (2001), 'Harm reduction associated with inhalation and oral administration of cannabis and THC', *Journal of Cannabis Therapeutics* 1 (3).
Harm Reduction Journal
www.harmreductionjournal.com
- Hathaway, A., Erickson, P. (2003), 'Drug reform principles and policy debates: harm reduction prospects for cannabis in Canada', *Journal of Drugs Issues* 0022-0426/03/02: 465–496.
- O'Hare, P., Newcombe, R., Matthews, A., Buning, E., Drucker, E. (eds) (1992) *The reduction of drug-related harm*, Routledge, London.
- Swift, W., Copeland, J., Lenton, S. (2000), 'Cannabis and harm reduction', *Drug and Alcohol Review* 19: 101–112.

⁽²⁾ See <http://en.eelda.org/index.aspx?o=5809>

Cannabis: a harm reduction perspective

Andrew Bennett

Harm reduction forms a part of many European countries' response to licit and illicit drug use: drinkers are advised to consume alcohol at safe levels; heroin users receive substitute drugs such as methadone; and drug injectors are encouraged to use clean injecting equipment.

Defining harm reduction

There is not a generally accepted definition of harm reduction. Historically, the main stimulus to the development of harm reduction policies and programmes was the identification of the role of injecting drug use and the sharing of needles and syringes in the transmission of HIV (Hunt, 2003). This led to the introduction of a range of practical initiatives such as needle and exchange schemes, low threshold services and programmes offering safer injecting advice. Thus, harm reduction strategies were seen as concerned with providing services to drug users at the individual level intending to reduce risk or rates of harm (e.g. needle exchange), while also aiming to reduce harm to others, e.g. preventing HIV among the wider community; and reducing public nuisance connected to drug taking.

Harm reduction definitions often do not describe whose harm should take priority: the user, the family or the wider community, and what type of harm it refers to — health, social, economic. Harm reduction also posits that individuals are able to make rational decisions about their behaviour. Once informed about the risks associated with drug use and how to avoid them, drug users are expected to be able to act on this information (Rhodes, 2002). While some commentators have seen abstinence as an ideal goal, most harm reduction strategies do not require abstinence.

Swift et al. (2004) provide practical criteria for assessing whether a policy or programme practises harm reduction that encompasses some of the above key points. Their central defining characteristic of harm reduction is the reduction of harm as a primary goal rather than the reduction of use per se. It must include strategies for those that continue to use as well as those aimed at reduction of use or abstinence. There should also be some attempt to evaluate whether these strategies will result in a net reduction in drug-related harm.

While harm reduction is often associated with schemes to reduce the harms of opioid use, strategies have also addressed other substances, in particular tobacco and alcohol. These include alcohol campaigns promoting sensible drinking and discouraging drink driving, training bar staff and door staff in avoiding incidents of drunkenness, and public space smoking bans to reduce people's exposure to second-hand smoke. While experience and practical measures are still limited, harm reduction may also have a role to play in helping with cannabis-related problems.

Health-related harm reduction and cannabis

Information, education and communication

Citizens in the EU will have varying degrees of access to a range of materials and media designed to impart knowledge about cannabis. However, drug related information, education and communication is an area of practice that is widespread yet seriously under-researched. In his review of harm reduction research, Hunt concludes that the existing evidence says very little about what sort of approaches work; for whom; to what extent; and whether they are cost-effective (Hunt, 2003).

In the United Kingdom, a small number of government-funded but independent organisations, such as DrugScope, HIT and Lifeline, produce and distribute booklets, leaflets and posters; host websites; and run multi-component campaigns that focus specifically on cannabis or include cannabis amongst other drug communications. Schools have a mandatory responsibility to educate young people about drugs, including cannabis. While guidance exists regarding school-based education and drug communication, the nature and extent of both activities can vary enormously. Increasingly, much health information is disseminated through non-official channels. Cannabis users, activists, 'headshops' and seed suppliers inform and educate about cannabis. Increasingly, websites and other multimedia publications offer information on the health effects of cannabis ⁽³⁾.

Information, education and communication approaches are not necessarily strategies of harm reduction.

Producing information materials that aim to reduce harm rather than prevent use per se is challenging, especially when the target audience is young people. Politicians, the media, parents and others can easily misconstrue a resource as condoning or

⁽³⁾ While web resources on cannabis vary greatly, some sites offer strong harm reduction materials, for example www.seedsman.com/en/health/cannabis-and-health and <http://en.eelda.org/index.aspx?o=5809>

encouraging drug use. Below is an extract from HIT's *The Stuff on Cannabis* booklet, which is aimed at young people aged 14 and above. The objective of the booklet (in its entirety and not just the extract) is to provide accurate, acceptable and useful information about cannabis for young people. The goal of the resource is to reduce harm.

To avoid the dangers of cannabis:

Don't use it. But if people do use cannabis the advice is ...

Don't take too much or use too often. Don't smoke every day.

Be aware that some types are very strong and could make you feel bad.

Remember it is still illegal and you could get into trouble with the law.

Don't smoke it with tobacco.

Avoid using it when you feel really down. It will probably make you feel worse.

Don't operate machinery or drive whilst stoned.

Avoid sexual situations you may later regret. If you have sex, use condoms.

Don't take other drugs at the same time, particularly alcohol. Mixing drugs can be dangerous.

If you are trying to cut down or stop, avoid people using it and places where they go.

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Consumption methods and techniques

The potential long-term harmful consequences of cannabis use are strongly related with the consumption method, that is respiratory risks associated with smoking the drug without, or simultaneously with, tobacco. A UK House of Lords Cannabis Report (1998) proposed the following hierarchy of risk:

Smoking a cannabis and tobacco joint is the most risky way of using the drug because the tars and toxins (plus the cigarette paper) is inhaled. Smoking a cannabis only joint enables the user to avoid inhaling tobacco. If cannabis is smoked in a pipe, no papers are burnt and inhaled and a proportion of tars and toxins may remain in the pipe. Water pipes or bongs may have advantages since the smoke will be inhaled at a cooler temperature and some tars may remain suspended in the water. Vaporisers are designed to heat cannabis to a point where the THC will be released without the plant combusting. Finally, the respiratory risks of cannabis smoking would be completely eliminated if users adopted oral methods of use.

Although research shows that cannabis may be a risk factor for the development of respiratory-related diseases (see Witton, this monograph), cannabis smoking is not thought to have a major public health impact on respiratory risks, including cancer, because most cannabis users stop their use in their 20s, few smoke more than a few joints in each session and the number of people who use in a chronic way is currently relatively small (Hall and MacPhee, 2002).

Nonetheless, recent information of the comparative pulmonary risks of cannabis smoking vis-à-vis cannabis smoking has improved, and suggests that cannabis has a similar effect on airflow obstruction to the lungs of two-and-a-half to five cigarettes (Aldington et al., 2007). Moreover, the low overall impact of cannabis smoking assumes that existing low-intensity patterns of use, together with a tendency for users to quit in their 20s, will continue. If more people smoked cannabis more frequently and for longer periods of their lives, the public health impact associated with respiratory-related diseases would be greater. It is also important to consider that cannabis consumption affects public health in other ways, for example its contribution to mental health problems and the consequences to users of a criminal conviction.

A number of cannabis resources provide information about specific techniques and tips that may reduce potential harm linked to airflow obstruction and inhalation of toxins. The rationale for such advice by necessity is often based on 'common sense' rather than research evidence. Below is an extract from HIT's cannabis booklet, which is aimed at cannabis users aged 16 and above.

You should:

Avoid holding the smoke in your lungs – you won't get any more stoned and this just makes more tar and other dangerous chemicals stick to your lungs.

Avoid inhaling too deeply – sucking on a bong or buckets may cool the smoke, but it forces it deeper into your lungs, so you breathe in more tar.

Clean weed properly – the bulk of THC is in the sticky tops and flowers, so you should take out the stem, leaves and other bits.

Avoid using a cigarette filter for a roach – filters may reduce the amount of THC you smoke. As a result you inhale more deeply which may increase the amount of tar you breathe. Avoid using anything printed (printers' ink gives off dangerous fumes when heated). A piece of plain card, loosely rolled up for a roach, allows the smoke to flow easily.

Avoid using too many papers — three-skinners are big enough and you will inhale less burnt paper.

Avoid using plastic bottles, rubber hoses, PVC, aluminium or foil to smoke cannabis — these all give off toxic fumes when hot (you run fewer health risks with a pipe made from glass, steel or brass).

Clean bongs and pipes properly after use – germs can hang around long enough to infect you and your friends.

Warning: Just because you like to get high, it doesn't mean everyone does. Show some respect and don't smoke around others, particularly children, who may be affected by you sparking up.

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Assessing the evidence that one mode of consumption is safer than another

In theory, the risk of damage to the respiratory system could be reduced if users adopted consumption methods and techniques that reduced the inhalation of cannabis (and tobacco) and related tars and toxins. The evidence for proposing that one mode of consumption is safer than another is, however, limited.

Laboratory studies suggested vaporisers provided the safest delivery of cannabis when compared with unfiltered and filtered joints and waterpipes (Gieringer, 1996; 2001). Vaporisers heat cannabis to temperatures between 180°C and 200°C and above, enabling the release of THC and other cannabinoids as a fine mist while reducing the toxic byproducts of smoked cannabis. While vaporisers are becoming increasingly available for cannabis smokers, a need for a safe delivery mode for therapeutic cannabis products have also prompted interest in this technology.

Perhaps surprisingly, the unfiltered joint 'performed better' than the waterpipes, that is, the ratio of THC to tar was less in an unfiltered joint compared with the waterpipes. The performance of the filtered joint was similar to the waterpipe, that is, the filter reduces the amount of THC, thus leading to the user inhaling more vigorously, resulting in increasing the amount of tars. The two vaporisers performed better than the unfiltered joint. A follow-up study by Gieringer (2001) confirmed that vaporisers offer the best prospects for reducing the harm from cannabis smoke. However, the researchers stress caution with these findings. They point out that the findings in the laboratory may not be reflected in humans, for example, the potency of cannabis used may be different than street cannabis.

Further research has been done on vaporisers as a delivery method. A laboratory study found that a vaporisation device provided an efficient and reproducible mode of delivery of THC (Hazekamp et al., 2006). A further pilot human laboratory study comparing a vaporiser to smoked cannabis found that the vaporiser was as effective as delivering THC but with little or no increase in carbon monoxide levels, a marker for toxins that may be generated by smoking (Abrams et al., 2007). Further suggestive evidence for the value of vaporisers emerged from a large Internet survey, which found that the use of vaporisers was associated with fewer respiratory symptoms than other modes of delivery used by respondents, although the self-selecting nature of the sample and the self-report basis of the data limits the generalisability of the study's findings (Earleywine and Barnwell, 2007).

This may have important health implications if, as is reported in Australia, users believe waterpipes are 'safer' because the water cools the smoke and dissolves some tar (Hall and Solowij, 1998). The study raised concerns about waterpipes not necessarily

protecting users from dangerous tars since they filter out more psychoactive THC than they do tars, thereby requiring users to smoke more to get the desired effect. The research raises doubts about the likelihood of an improved high by using waterpipes because some of the THC is lost in the water. However, as Gieringer (1996) and Iversen (2000) recognise, this 'loss' may be compensated by simply using more cannabis and holding the fumes in the lungs for longer periods.

Some studies also highlight the possibility that increased cannabis potency may have a potentially protective effect, since the concentration of tars relative to THC will be reduced. If this is the case, it would suggest a contradictory perspective to that which is most commonly highlighted in scientific and popular debate regarding increased THC potency, namely that potency increase causes increased adverse health effects (Hall and Swift, 2000; see also King, this monograph).

Will cannabis users adopt safer ways of administration?

The consumption modes significantly associated with respiratory risks — cannabis and tobacco joint or cannabis joint — are the most frequently used in Europe. Conversely, only a minority of cannabis users choose to vaporise or swallow the drug as their main method of use, even though they offer a means to avoid respiratory risks. Hence, it is important to pose the question: will users adopt safer ways of administration?

Smoking is an effective way of delivering drugs to the brain and the rapid delivery of the drug to the brain by smoking seems to be an important factor in determining the subjective experience of the 'high' (Iversen, 2000). The effects are felt almost instantly and it is relatively easy to control or titrate the dose, for example if the cannabis is stronger than anticipated, the user will know this within a matter of seconds. By contrast, taking cannabis by the mouth is less reliable in delivering a consistent dose of the drug. Most of the drug when swallowed will be processed in the liver before general circulation takes it to the brain. The peak levels of the drug, and thus the 'high', will occur 1–4 hours after taking the drug (Stafford, 1992; see also Corrigan, this monograph).

However, the behaviours and consequences of cannabis consumption are not just determined by the drug and its method of use. Individual beliefs, expectations and reasons for using, as well as the social environment in which it is used, are also important. Surprisingly, there is a limited amount of research that explores the social context, use preferences and roles of cannabis use. Research that did explore the functions and pathways of young adult drug takers in Salford in the United Kingdom illustrates that different modes of cannabis consumption produce different effects.

I don't really take buckets ⁽⁴⁾ cos they don't really agree with me, the rush is too fast. It hits me too quick. I like to get it gradually. I'll have a bong cos it don't hit you as fast. Spliffs are just

brilliant because you get everything out of it, you get all the feeling. Buckets you don't cos it just hits you and then it's gone. Bongs hit you slow but it don't last long.

20-year-old unemployed female, as quoted in Henderson (1995).

In a *Mixmag* (2002) ⁽⁵⁾ article a 'willing guinea pig examines the merits of spliffs, bongs and cakes'. In response to the question 'how long till you're battered?' the guinea pig answers 'two minutes' (spliff), 'little under a minute' (bong) and 'two hours' (cake). In response to the question, 'how long do you feel caned for?' the subject answers 'two hours' (spliff), 'no idea ... in the morning I realise it had lasted six hours' (bong) and 'fucking ages. I'm useless for eight hours' (cakes).

Bell et al.'s (1998) research focuses on the role of friendship groups as a means of initial contact with cannabis, and learning about its use in the context of transitions to adulthood. He argues that understanding the social context of cannabis use involves examining their explanations for cannabis use, the methods of use, the physical location and the time they take it, and the social group it occurs within. Examples are provided of young people experimenting with a range of methods of using cannabis, and different ways of getting a 'hit', sometimes with unintended consequences, as one interviewee explains:

I was cookin' it and that, yeah, an' I didnae get to ma bed til about 4 am, ken and I didnae feel quite right ken, I woke up in the morning and I was still the same.⁽⁶⁾

Research conducted by Bennett (2002) explored the reasons why people use cannabis in the way they do and discussed the public health implications of the findings. It was concluded that a range of factors negate against the adoption of safer consumption methods. Cannabis, when inhaled in the form of a joint or spliff, is controllable in terms of the severity and length of the effect when compared with using bongs and vaporisers or eating the drug. Preparing and sharing joints is routine and a social activity. Alternative methods of smoking, including bongs and vaporisers, involve using other paraphernalia that may be inconvenient to use and expensive to buy. Further research that examines the different nuances and complexities of cannabis use, including consumption methods and techniques, is needed.

(4) 'Buckets' is a way of smoking cannabis in the UK. Usually, the cannabis smoke is captured in a plastic bottle with the bottom cut off. The plastic bottle is then pushed down into water (often in a bucket), thus causing the cannabis smoke to be released very quickly through the top of the bottle in relatively large amounts. The smoke is then inhaled.

(5) *Mixmag* is a UK dance magazine. The phrase 'how long till you're battered?' means, how long before you feel the effect of the cannabis; and 'how long do you feel caned for?' means, how long do the effects last.

(6) The extract is in the local dialect. The word 'cookin' refers to preparing cannabis in food; and 'ken' should read 'know what I mean'.

Cannabis and tobacco: double trouble?

It has been estimated that 70% of cannabis users in the United Kingdom smoke with tobacco (Atha and Blandhard, 1997). Two qualitative studies in Scotland with 15- to 19-year-olds have identified three links between cannabis and tobacco (Amos et al., 2004) ⁽⁷⁾. These are:

- Cannabis is linked to starting tobacco consumption — ‘I hadn’t smoked at all, but ... I got into that (hash) and then that made me get addicted to tobacco.’
- Cannabis can reinforce tobacco consumption — ‘if you’ve no’ got any hash, you just smoke your fags.’
- Cannabis can make giving-up tobacco more difficult — ‘I’ve tried to stop smoking but ... you cannae go without a fag ... you need it for your hash.’

Recognising the cannabis-tobacco link, Health Scotland published a booklet for young people titled *Fags ‘n’ Hash: the essential guide to cutting down the risks of using tobacco and cannabis*. In some parts of the United Kingdom, the National Health Service tobacco smoking cessation services are incorporating cannabis within their interventions with adults. Faced with the difficulties in promoting safer cannabis use, secondary prevention and treatment approaches aimed at controlling, cutting down or stopping consumption could also be seen as a plausible harm reduction technique.

A number of countries have recently developed and implemented interventions designed to enable heavy, frequent users to reduce or stop their cannabis use. In the UK the government in 2004 launched the *Know Cannabis* campaign to enable users to cut down or stop their cannabis consumption. The multi-component campaign included leaflets, posters, *A Guide to Cutting Down or Stopping Cannabis* and a self-help website ⁽⁸⁾. In the Netherlands a self-help website has been in existence for a number of years ⁽⁹⁾. These interventions use cognitive behavioural approaches, and include: assessment of the benefits and costs of cannabis; planning and preparing for change; setting targets; identifying high-risk situations; dealing with withdrawal; and relapse prevention.

The above types of secondary prevention or treatment approaches should form a part of a comprehensive approach to reducing cannabis-related harm. Harm reduction establishes a hierarchy of goals, with the more immediate and realistic ones to be achieved as first steps toward reduced risks or, if appropriate, abstinence. Cannabis users need to be aware and have the option of accessing a range of appropriate interventions.

⁽⁷⁾ ‘Hash’ is cannabis and ‘fags’ are cigarettes.

⁽⁸⁾ See www.knowcannabis.org.uk

⁽⁹⁾ See www.jellinek.nl/zelfhulp/cannabis

Conclusion

Cannabis is the most widely used drug in Europe and many users seemingly enjoy their use of the drug without it leading to any significant negative social or health effects. However, it is not a harm-free drug. Heavy, frequent use is associated with increased susceptibility to respiratory disorders, dependency, precipitation or exacerbation of mental health problems in vulnerable people, and cognitive impairment. Some young people, especially those that use heavily and frequently, may be particularly vulnerable to mental health problems. Furthermore, a criminal record as a consequence of cannabis can also cause problems.

Harm reduction frameworks provide a useful way to appraise and respond to cannabis-related problems. However, there is a lack of information about the design and delivery of harm reduction interventions, and a greater lack of evidence of successful application. Many EU countries are beginning to recognise the healthcare needs of cannabis users. There is a need for the development of accessible interventions for cannabis-related problems including accurate, credible and targeted information; and secondary prevention for young people and adults who want to cut down or stop their cannabis consumption.

Unfortunately, the most common method of using cannabis — smoking — is also the most risky mode of administration. While some cannabis consumption methods and techniques, such as vaporiser use, may protect health to an extent, the evidence base is limited. Social, cultural and economic obstacles, and preferences by users themselves indicate that such modes of administration may not be widely adopted.

Cannabis and harm reduction has been considered in various ways in this chapter. Critical to the success of any intervention is the need to recognise that many people experience cannabis as enjoyable and trouble free, whilst accepting that some people require help to reduce or stop. Another vital aspect is to realise that non-official sources of information — cannabis-using peers, advocacy groups, headshops and websites — often play a role in educating cannabis users, and there is a need to engage such actors in delivering accurate harm reduction messages.

Thanks to Mark Bellis, Annemarie Carr, Neil Hunt, Simon Lenton and John Witton.

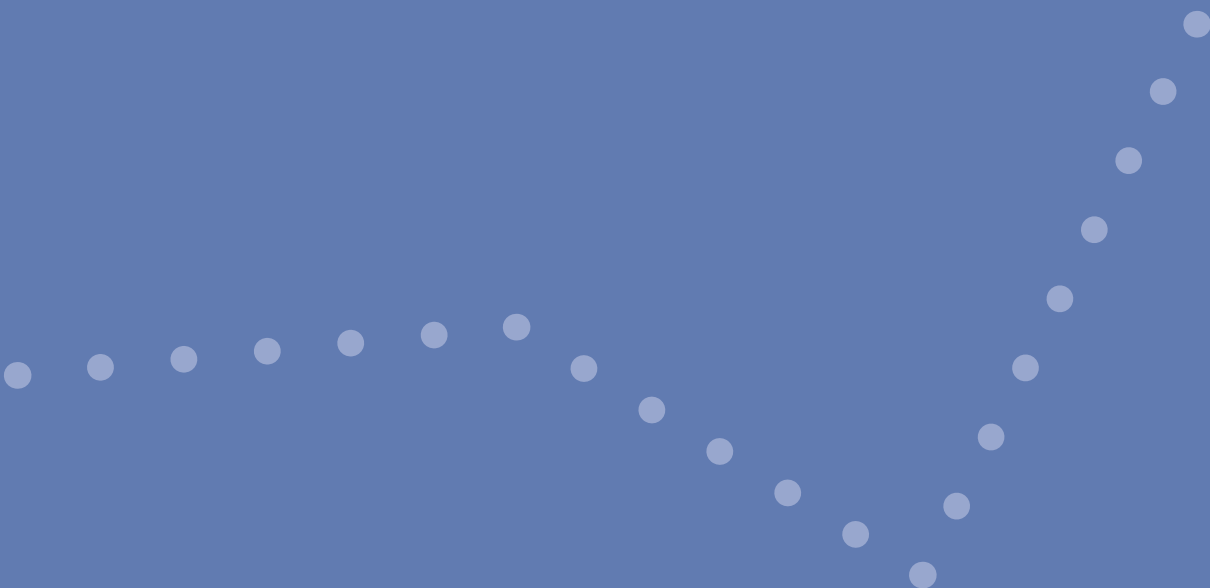
Bibliography

- Abrams, D., Vizoso, H., Shade, S., Jay, C., Kelly, M., Benowitz, N. (2007), 'Vaporization as a smokeless cannabis delivery system: a pilot study', *Clinical Pharmacology and Therapeutics*, online publication, 11 April.
- Aldington, S., Williams, M., Nowitz, M., Weatherall, M., Pritchard, A., McNaughton, A., Robinson, G., Beasley, R. (2007), 'The effects of cannabis on pulmonary structure, function and symptoms', *Thorax*, 31 July 2007.
- Amos, A., Wiltshire, S., Bostock, Y., Haw, S., McNeill, A. (2004), "'You can't go without a fag, you need it for your hash": a qualitative exploration of smoking, cannabis and young people', *Addiction* 99(1): 77–81.
- Atha, M., Blanchard, S. (1997), *Regular users: self-reported drug consumption patterns and attitudes to drugs among 1333 regular cannabis users*, IDMU Publications, Independent Drug Monitoring Unit, Wigan.
- Baker, J., Goh, D. (2004), *The cannabis cautioning scheme three years on: an implementation and outcome evaluation*, NSW Bureau of Crime Statistics and Research, Sydney.
- Bammer, G., Hall, W., Wayne, D., Hamilton, M., Ali, R. (2002), 'Harm minimisation in a prohibition context: Australia', *Annals of the American Academy of Political and Social Sciences* 58: 80–93.
- Bell, R., Pavis, S., Cunningham-Burley, S., Amos, A. (1998), 'Young men's use of cannabis: exploring changes in meaning and context over time', *Drugs: education, prevention and policy* 5 (2): 141–155.
- Bennett, A. (2002), 'An examination of the different reasons for cannabis consumption modes as a basis for reducing respiratory risks: a functional perspective', MSc Social Intervention for Public Health dissertation, Imperial College of Science, Technology and Medicine, London.
- Bullington, B., Bollinger, L., Shelley, T. (2004), 'Trends in European drug policies: a new beginning or more of the same?', *The Journal of Drug Issues* 4(3): 481–490.
- Copeland, J. (2004), 'Developments in the treatment of cannabis use disorder', *Current Opinion Psychiatry* 17: 161–167.
- Department for Education and Employment (1998), *Protecting Young People. Good practice in drug education in schools and the youth service*, Circular 4/95 Drug Prevention in Schools, London.
- Earleywine, M., Barnwell, S. (2007), 'Decreased respiratory symptoms in cannabis users who vaporize' www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1853086
- EMCDDA (2004), *Annual report*, European Monitoring Centre for Drugs and Drug Addiction, Lisbon.
- Gieringer, D. (1996), Waterpipe study, *MAPS* 6 (3), Multidisciplinary Association for Psychedelic Studies.
- Gieringer, D. (2001), Study shows vaporizers reduce toxins in marijuana smoke. *MAPS* 11 (2), Multidisciplinary Association for Psychedelic Studies.
- Hall, W. (2005), 'The prospects for tobacco harm reduction', *The International Journal of Drug Policy* 16(3).
- Hall, W., MacPhee, D. (2002), 'Cannabis use and cancer', *Addiction* 97: 243–247.
- Hall, W., Solowij, N. (1998), 'Adverse effects of cannabis', *Lancet* 1352(9140): 1611–1616.
- Hall, W., Swift, W. (2000), 'The THC content of cannabis in Australia: evidence and policy implications', *Australian and New Zealand Journal of Public Health* 24: 503–508.
- Hazekamp, A., Ruhaak, R., Zuurman, L., van Gerven, J., Verpoorte, R. (2006), 'Evaluation of a vaporizing device (volcano) for the pulmonary administration of tetrahydrocannabinol', *Journal of Pharmaceutical Sciences* 95(6): 1308–1317.
- Henderson, S. (1995), *Young people's drug use in Salford; drug pathways through today's youth culture*, Salford Drugs Prevention Initiative, Salford.
- HIT (1999–2005), *Cannabis booklet*, HIT, Liverpool.

- House of Lords (1998), *Cannabis – the scientific and medical evidence*, Select Committee on Science and Technology, The Stationery Office, London.
- Hunt, N. (2003), *A review of the evidence-base for harm reduction approaches to drug use*, Forward Thinking on Drugs, London.
- Iversen, L. (2000), *The science of marijuana*, Oxford University Press.
- May, T., Warburton, H., Turnbull, P., Hough, M. (2002), *Times they are a-changing — policing cannabis*, Joseph Rowntree Foundation, York.
- Newcombe, R. (1992), 'The reduction of drug-related harm: a conceptual framework for theory, practice and research', in O'Hare, P., Newcombe, R., Matthews, A., Buning, E., Drucker, E. (eds) *The reduction of drug-related harm*, Routledge, London.
- Rhodes, T. (2002), 'The risk environment: a framework for understanding and reducing drug-related harm', *International Journal of Drug Policy* 13: 85–94.
- Room, R. (2004), 'Alcohol and harm reduction, then and now', *Critical Public Health* 14: 329–344.
- Stafford, P. (1992), *Psychedelics Encyclopedia, Third Expanded Edition*, Ronin Publishing, Berkeley.
- Stead, M., Hastings, G., Eadie, D. (2002), *Desk research to inform the development of communications to reduce drug use and drug related harm in socially excluded communities*, Department of Health, London.
- Swift, W., Hall, W., Copeland, J. (1998), 'Characteristics of long-term cannabis users in Sydney, Australia', *European Addiction Research* 4: 190–97.
- Swift, W., Copeland, J., Lenton, S. (2004), 'Cannabis and harm reduction', *Drug and Alcohol Review* 19: 101–112.
- Warburton, H., May, T., Hough, M. (2004), 'Looking the other way. The impact of reclassifying cannabis on police warnings, arrests and informal action in England and Wales', *British Journal of Criminology* 44(4): 1–16.

Supply and production issues

PART III



Chapter 12

Global cannabis cultivation and trafficking

Keywords: cannabis – cannabis herb – cannabis resin – cultivation – demand
– prices – seizures – supply – trafficking

Setting the context

Sizing markets for illicit products is always difficult. The most basic challenge is that the standard yardsticks common for legal markets cannot be used. Analysis and forecasts are simply not available for illicit goods, and economists working on the issue are faced with a lack of standard sources such as investor reports, tax declarations and fiscal yields, obligatory bourse filings, performance indicators, customs duties, wholesale and retail reports and the trade press.

So drug market analysts must instead make do with a piecemeal substitute, triangulating information obtained from various channels: enforcement (police reports, crime statistics, customs seizures data), healthcare (drugs epidemiology, treatment indicators) and a more nebulous literature base produced by drugs workers and charities, think tanks, academics and policymakers, and journalists. While in some cases, statistics are produced on a standard, usually annual cycle (United Nations Office on Drugs and Crime (UNODC), EMCDDA, World Customs Organisation, Interpol), more often than not analysis is ad hoc and restricted in scope, for example national, regional or single-theme studies.

UNODC is the primary provider of research into the machinations of the global illicit drugs market. In this chapter, UNODC authors reveal that, for cannabis, estimating supply is even more difficult than for other drugs, such as heroin and cocaine. For example, while satellite data have recently been used to estimate areas of cultivation in a report on Morocco, there is strong variation in crop yields and the cost of expanding such scrutiny on a global level is prohibitive. Another difficulty is that supply is moving closer to the consumer. As indoor cultivation, self-supply and locally grown herbal

cannabis become more common, the likelihood of seizures providing a complete picture of the market decreases. Beyond this, there is also considerable variation in how herbal cannabis and cannabis resin seizures are reported, a fact further impacted by the relatively low standardisation of information on the product itself (e.g. resin or herb, potency and estimated dose consumed by users).

Nonetheless, this chapter points out that indicators suggest that worldwide cannabis cultivation increased throughout the 1990s until 2004, in keeping with growing demand, both at the global level and in Europe. Only in 2005 was a reduction reported. For herbal cannabis, North America remains the largest market and is largely self-contained. For cannabis resin, Europe remains the largest consumer market, predominantly supplied by Morocco (see also Gamella and Jiménez Rodrigo, this monograph), even though Morocco's importance as a source country for cannabis is declining. Despite some progress made in recent years, there can be no doubt that more research and better official record-keeping are required to provide more precise estimates on the total amount of cannabis grown and consumed globally. And while work is taking place — some European countries are modelling consumption patterns for intensive cannabis use (EMCDDA, 2007) — this chapter offers practical suggestions for improving our knowledge of the market.

Further reading

- Ben Lakhdar, C. (2007), *Le trafic de cannabis en France*, OFDT, Paris.
- EMCDDA (2007), *Annual report 2007: the state of the drugs problem in Europe*, European Monitoring Centre for Drugs and Drug Addiction, Lisbon.
- Hough, M., Warburton, H., Few, B., May, T., Man, L-H., Witton, J., Turnbull, P. (2003), *A growing market, the domestic cultivation of cannabis*, Joseph Rowntree Foundation, Homestead.
- Jansen, A. (2002), 'The economics of cannabis-cultivation in Europe', paper presented at the 2nd European Conference on Drug Trafficking and Law Enforcement, Paris, 26–27 September.
- Leggett, T. (2006), 'Cannabis: why should we care?', Chapter 2 of *World Drugs Report 2006*, UNODC, Vienna.
- van Solinge, T. (1998), 'Drug use and drug trafficking in Europe', *Journal of Economic and Social Geography* 89(1): 100–105.
- UNODC (2005), 'Estimating the value of illicit drug markets', Chapter 2 of *World Drugs Report 2005*, UNODC, Vienna.
- UNODC (2007), 'Chapter 1.4: Cannabis market', in *World Drugs Report 2007*, UNODC Vienna.

Global cannabis cultivation and trafficking

Ted Leggett and Thomas Pietschmann

Abstract

Though cannabis is, by far, the most widely used illegal drug worldwide, consumed by some 3.8% of the population aged 15–64 in 2005–2006, little scientific information is available on the actual extent of its cultivation and its yields. Information collected by UNODC indicates that it is produced in (at least) 172 countries across the globe. UNODC's best estimates, based on Member States' estimates and some indirect measurement techniques, suggest that some 42 000 tonnes of cannabis herb and 6 600 tonnes of cannabis resin were produced at the global level in 2005, slightly down from the peak in 2004, though still significantly more than in the early 1990s. This pattern is in line with global cannabis herb and resin seizures and global cannabis consumption estimates. The largest cannabis herb seizures have been reported from North America (Mexico, followed by the USA), followed by Africa and South America. The largest cannabis resin seizures have been reported from Western Europe (notably Spain), followed by countries of South-West Asia (Pakistan, Iran and Afghanistan) and North Africa (Morocco). Production of cannabis resin in Morocco, the world's largest cannabis resin producer and main supplier of it to Europe, has been declining since 2004, while production in Afghanistan is increasing. The chapter also makes a number of proposals on key areas where more research is needed.

Strong increases in global cannabis cultivation have been reported over the last four decades, largely related to rising demand in North America, Europe and Australia. Increased production occurred first in the traditional cannabis-producing countries and, more recently, in the developed countries that provide the most lucrative consumer base. Only in 2005 were the first signs of a decline in global cannabis production seen, following years of continuous increases in the 1990s and in the early 2000s.

It remains difficult to establish how much cannabis is produced globally. Unlike other drug crops, cannabis is a plant that can be grown in virtually every inhabited region of the world, and can be cultivated with little maintenance in small plots, or even indoors. UNODC regularly collects, mainly using its Annual Reports Questionnaire (ARQ), estimates from UN Member States on the areas under cannabis cultivation and estimated yields. But reliability of these figures is significantly lower than the corresponding estimates for heroin or cocaine, which are typically made using satellite photos and scientific yield assessments.

Heroin and cocaine production estimates are facilitated by the fact that production of opium and of coca leaf is nowadays geographically concentrated in just a few areas. A global assessment of cannabis cultivation, in contrast, would have to be truly global, and would be both extremely difficult and expensive. An idea of the costs involved can be derived from UNODC's work in this area. UNODC has conducted studies of the extent of cannabis cultivation in Central Asia in the late 1990s and, in collaboration with the government of Morocco, of the primary cannabis-producing areas of that country in 2003, 2004 and 2005. The latter studies employed the use of remote sensing technology as well as ground survey data. Conducting such comprehensive surveys in countries the size of Morocco would probably cost between USD 200 000 and USD 300 000 per country. While Morocco actually covers a large part of the survey costs, many other countries would not be in a position to do so, which would leave the costs with the international community.

Even if the precise number of hectares dedicated to cannabis cultivation worldwide could be determined with the help of remote sensing technology, estimates of crop yields would still be a challenge. Although cannabis can be grown in most countries, its productivity is directly linked to growing conditions, and cannabis is a highly adaptable plant. Depending on the cultivar and the environment in which it grows, cannabis can vary in appearance from a small weed to a substantial bush to a five-metre tree (Clarke, 1981).

Yield estimates provided by Member States to UNODC ranged from as low as 5 kg per hectare for wild cannabis to 17 500 kg per hectare for countries that reported a high proportion of hydroponically grown cannabis. The median cannabis yield was 730 kg per hectare, and the unweighted average yield was 2 070 kg per hectare (UNODC, 2007). Moreover, cannabis can be 'adulterated' considerably by the inclusion of inert (or relatively inert) plant material. All of this makes coming up with an estimate of yield per plant or per unit area (square metre or hectare) a difficult exercise. Yield estimates must also take into consideration whether the plants in question were intended to be used for cannabis herb or resin production. Cannabis can be consumed with little processing after harvesting. As a result, users can feasibly cultivate their own supply, and production is highly decentralised. While substantial international trafficking of cannabis does occur, it is unclear what share of the total market this comprises. It appears that many countries can satisfy much of domestic demand with locally produced cannabis (see Korf, this monograph), and this trend appears to be growing in many important markets.

The matter is complicated further by the fact that cannabis comprises two distinct drug products, cannabis herb and cannabis resin. Over the period 2000–2005, 82% of the cannabis end-product seizures concerned cannabis herb and 18% cannabis resin (UNODC, ARQ). Herbal cannabis comes in various grades, including a product made

up of only the unfertilised buds of the female plant, known as *sinsemilla*. There are also various grades of hashish, based on amount of impurities contained in the final product. In addition, it is possible to produce 'cannabis oil', although this form of the drug is not widespread: 0.02% of global seizures of cannabis end-products over the 2000–2005 period, and only 0.01% in 2005.

While herbal cannabis is consumed throughout the world, the largest market for cannabis herb is in North America, where 63% of global seizures occurred in 2005, followed by Africa (18% in 2005). Europe accounted for just 2% of global cannabis herb seizures in 2005, down from 4% in 2000 (UNODC, ARQ). Changes in law enforcement priorities among some European countries may also have played a role here.

Western Europe is the largest market for cannabis resin, responsible for more than 70% of global seizures in 2005. UNODC estimates that around 70% of this hashish was produced in Morocco in 2006, down from some 80% in previous years (UNODC, 2007). In 2003, France reported that 82% of the cannabis resin found on its market in 2002 originated in Morocco. Similar estimates were made for Belgium (80%), Sweden (85%), and the Czech Republic (70%). Spain, Italy, Denmark, Finland and Ireland reported that almost all of the cannabis resin originated in Morocco (UNODC, 2006). By 2005–2006, most European countries reported a decline of the importance of Moroccan cannabis resin. Based on individual drug seizure data provided by the World Customs Organisation (WCO) to UNODC cannabis from Morocco accounted for, in weight terms, 74% of total cannabis resin seizures made in Western Europe in 2006, down from 82% in 2004. In terms of number of seizure cases, the proportion of Moroccan cannabis fell to 67% by 2006, according to WCO data. All of this reflects an underlying decline of cannabis resin production in Morocco in recent years.

While UNODC relies primarily on official government figures for its global estimates, these estimates are not available for all cannabis-producing countries in the world. Only a few countries have scientifically valid estimates based on remote sensing technology or based on ground surveys. Most countries provide estimates based on some extrapolations from their cannabis eradication activities. Where official figures for cannabis herb production are not available, UNODC bases its estimates on demand data, also taking police intelligence into account. Law enforcement information is often available with regard to a country's position as a cannabis production, transit or export country. For countries that are neither importing nor exporting countries, it can be assumed that domestic demand is covered by domestic production. For cannabis importing countries, there are usually rough estimates available on the share of imported cannabis. Similarly, for cannabis exporting countries there are rough estimates available on the proportion of cannabis produced for local production and for export. Based on such information and estimates on the size of the local cannabis market, likely orders of magnitude of domestic cannabis production can be established.

This approach, of course, is not without difficulties. Survey data on cannabis use are also not available for all countries. In such cases, the sub-regional prevalence rates are used as a proxy. Even where available, many important questions may remain unanswered, particularly with regard to the quantities of cannabis consumed per user. Where these figures are available, the reliability of such consumption estimates can still be questioned. Even for experienced users, estimating total consumption can be difficult: cannabis is often smoked communally, with many consuming less than a whole 'unit' in a single session of use. Use levels also vary based on drug availability and potency.

Despite these difficulties, available data show some general trend patterns. Most available indicators suggest that cannabis production, after having fallen in the late 1980s (mainly due to large-scale eradications in Latin America), rose again in the 1990s and continued rising in the new millennium until 2004 before falling back in 2005. Similarly, the volumes of cannabis seized by customs and the police have been increasing from the early 1990s until 2004 at the global level before declining strongly in 2005. Drug use surveys also show that global demand increased until 2004 before declining in 2005. An estimated 159 million people, or 3.8% of the population age 15–64, used cannabis at least once in the 12 months prior to the survey(s) in 2005–2006, down from 162 million people in 2004. This figure for 2005–2006 is, however, still some 10% higher than for the late 1990s (144 million people in 1997–1998) (UNODC, 2007). Despite the decline in 2005, consumption estimates and expert opinions solicited from UN Member States suggest that cannabis use has been growing faster than the use of cocaine or opiates over the last decade (UNODC, 2007).

To keep up with growing demand, either more land area would have been needed for the crop, or technological innovation would have been required to make cannabis production more efficient. Both factors seem to have played a role in increasing supply over the last decade. In fact, in addition to some expansion in the area under cultivation, great strides have been made in improving cannabis plot productivity, particularly indoors in developed countries.

Cannabis herb production

As argued above, the unique properties of the cannabis plant have led to its widespread and diffuse cultivation. Over the 1995–2005 period, 82 countries provided UNODC with cannabis production estimates. For comparison, only 46 countries provided estimates for opium-poppy cultivation, and only five provided estimates for coca-leaf production (DELTA, 2007). But the fact that a country did not provide an estimate does not mean that no cultivation exists, as some countries simply lack the capacity to come up with estimates. However, there are also some other ways of identifying cannabis-producing countries.

UN Member States — as part of the ARQ — are asked to identify the source(s) of the cannabis consumed in their countries. While this anecdotal evidence is basically opinion data, it is often based on considerable experience in the field, and its value should not be underestimated. On this basis, 134 producer countries could be identified as likely cannabis producers (UNODC, 2007). A third list of producer countries can be generated by singling out those that report the seizure of whole cannabis plants. It is extremely inefficient to transport whole plants internationally, as only certain parts are useable as a drug. Thus, when a whole plant is seized, it is very likely that it was locally produced. Seizures of whole cannabis plants were reported in 146 countries during the 1995–2005 period. Combining these three lists results in the identification of 172 countries and territories where cannabis is produced, out of 197 countries reporting (87%) (UNODC, 2007).

Of course, evidence of some cultivation does not mean the practice is large in scale. Many of these 172 countries seem to produce primarily to satisfy local demand, but there are a number of countries that produce for mass export.

For example, Paraguay produces much of the cannabis consumed in its neighbouring countries, and European production hubs include Albania and the Netherlands. Other significant exporters include:

- in Africa: Nigeria, South Africa, Malawi, Lesotho and Swaziland;
- in the Americas: Mexico, Canada, Jamaica and Columbia;
- in Central Asia: Kazakhstan and Kyrgyzstan;
- in the Middle East: Egypt and Lebanon;
- in South Asia: India; and
- in South-East Asia: Cambodia, Thailand and the Philippines.

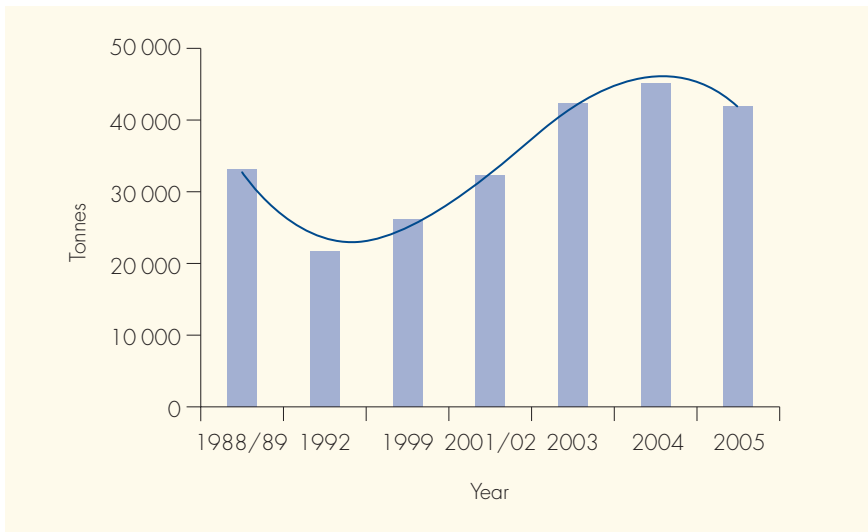
Quantifying this production is another matter. As discussed above, estimating the volume of global cannabis production is extremely difficult. The 2004 *World Drug Report* (WDR) provided an estimate of about 32 000 tonnes of cannabis herb production at the global level for 2001–2002. The 2005 WDR estimated global cannabis herb production to have amounted to 42 100 tonnes in 2003. Since the methods used in arriving at these two calculations were not identical, this should not be interpreted as a dramatic increase in just two years. Excluding demand-based production estimates, introduced for the first time in the 2005 WDR, the global estimate would have still increased to around 35 000 tonnes for 2004. Applying the revised methodology, as developed for the 2005 WDR, the 2006 WDR saw a further increase from 42 100 to 45 000 tonnes in 2004. The upward trend, however, did not continue for the subsequent year. Without any further change in methodology, the 2007 WDR saw a decline to 42 000 tonnes in 2005 — the first decline in several years — mainly due to declines reported from North America and

Africa, while production continued to rise in many other parts of the world. Despite this decline, production is still higher than a decade ago (Figure 1).

There are also other indications suggesting that global cannabis production has been increasing over the last decade before falling in 2005. Estimates of the number of cannabis consumers globally (based on survey data) and information on the quantities of cannabis seized globally by law enforcement have shown increases until 2004 and a decline in 2005. Where prevalence data and seizure data are available, such as in the USA, a strong correlation between the two datasets was identified in the past, suggesting that cannabis seizure statistics, in general, do reflect consumption trends rather well. The same is true, if looked at from a global perspective, for cultivation and production trends (UNODCCP, 1999) (Figure 2).

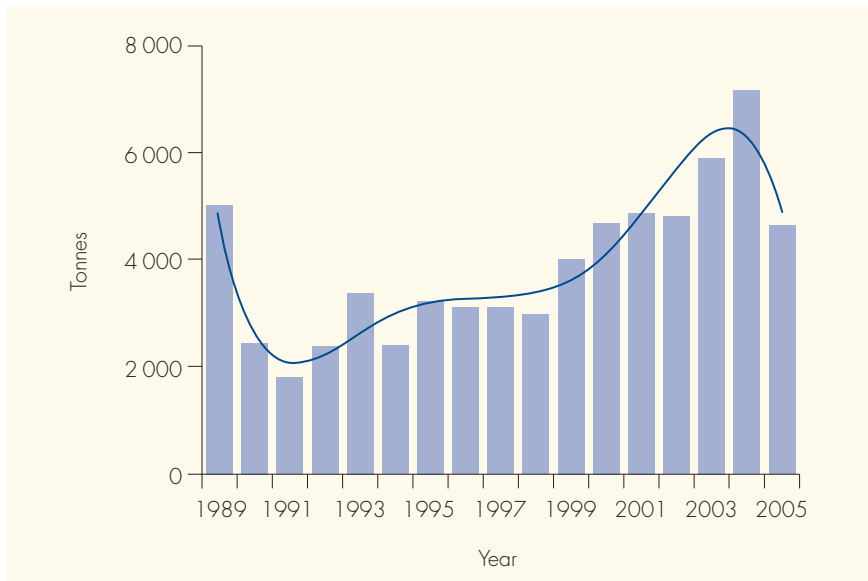
In terms of distribution, estimates made available to the UNODC suggest that the Americas account for some 47% of global cannabis herb production. About half of this, or close to 10 000 tonnes, is produced in North America. The second-largest producer is Africa, accounting for some 25% of global production. Asian countries account for about 22% of global cannabis production. Most of the cannabis in Asia is produced in South-West Asia and the Middle East. Production in Europe, estimated at less than 2 300 tonnes, accounts for 5% of global cannabis herb production.

Figure 1: Estimates of global cannabis herb production



Sources: UNODC annual reports questionnaire data, other government reports and UNODC estimates.

Figure 2: Global cannabis herb seizures



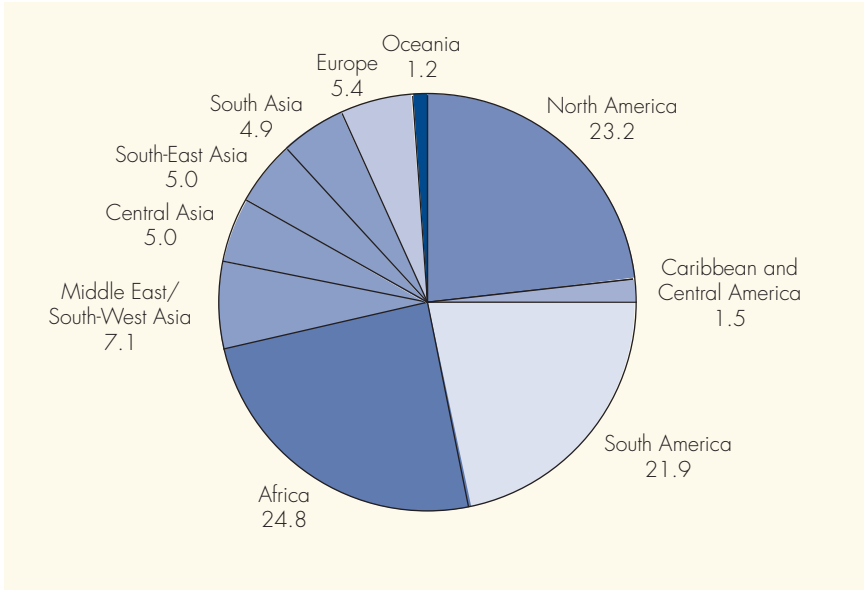
Source: UNODC annual reports questionnaire data.

As mentioned above, all of these must be considered as tentative estimates. For instance, for the USA, one of the best studied countries in the world, estimates based on cannabis eradication data ranged from 5 600 tonnes to 16 700 tonnes (Drug Availability Steering Committee, 2002) in 2000/2001 while demand-based estimates suggested production figures of around 1 000 tonnes (ONDCP, 2000). Eradication-based production estimates for 2006 ranged from 5 650 to 9 420 tonnes, with a mid-range estimate of some 7 530 tonnes. Estimates of net production (after eradication) ranged from 2 830 to 6 590 tonnes with a mid-range estimate of 4 710 tonnes for the USA in 2006 (US Department of Justice, 2007) (Figure 3).

There has been some debate as to whether potency has increased in recent decades. This debate is complicated by the fact that comparable potency data are available for only a small number of countries throughout the world. A review of the potency evidence in Europe was undertaken by EMCDDA in 2004 (see King, this monograph). It remained sceptical about overall increases in Europe. Unfortunately, this analysis conflated herbal and resin markets.

In fact, the potency of cannabis resin — which is mainly imported into Europe from Morocco — seems to have remained stable. However, there is strong evidence that herbal cannabis, which appears to be growing in popularity in a number of European countries, is becoming more potent, largely due to the increasing availability of indoor-produced sinsemilla, a trend seen both in Europe and in other developed countries.

Figure 3: Distribution of cannabis herb production, 2005 (42 000 tonnes)

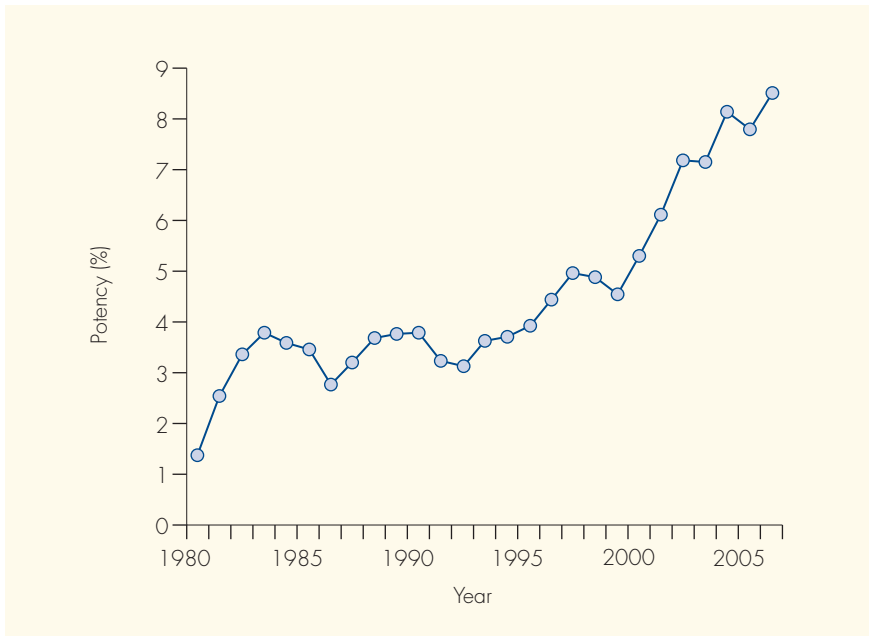


Source: UNODC annual reports questionnaire data, other government reports and UNODC estimates.

For example, Dutch sinsemilla, which accounts for the bulk of the cannabis market in the Netherlands, doubled in potency in just five years, from about 9% in 1999/2000 to about 18% in 2004–2005 (Niesink et al., 2005). In Germany, the European country with the largest sample base, no distinction is made between sinsemilla and commercial cannabis. Despite this, aggregate herbal potency has doubled in less than a decade. In 1996, samples averaged about 5%, rising to about 11% in 2004. (Bundeskriminalamt, 2005). In the United Kingdom, sinsemilla potency doubled between 1995 and 2002, from about 6 to about 12% (King et al., 2004). In the other two countries for which comparable data are available, the USA and Canada, cannabis potency is also increasing (Second Technical Conference on Drug Control Research, 2004). In the USA, the *Cannabis Potency Monitoring Project* found an increase in the average potency of cannabis from less than 2% in 1980 to around 4% in the late 1980s, around 5% in the late 1990s and 8.5% in 2006 (1). This total included an average sinsemilla potency of over 14% in each year since 2002, up from 8% in the mid-1980s (University of Mississippi, 2007) (Figure 4).

(1) The proportions were calculated based on 59 369 cannabis herb samples, 1 225 cannabis resin samples and 443 cannabis oil samples analysed by forensic laboratories in the USA over the 1975–2006 period. Two-thirds of the 2006 samples were obtained from law enforcement seizures and purchases, and the remaining were from domestic eradications. The law enforcement seizures were obtained from 45 different states across the USA (University of Mississippi, 2007).

Figure 4: USA — average cannabis potency, 1980–2006



Source: University of Mississippi, 2007.

Increases in potency may be also linked to a growing share of the herbal cannabis market in developed countries being produced domestically, with a declining share being the relatively low-potency product traditionally imported from developing countries. In the United Kingdom, it is estimated that as much as half the cannabis consumed is domestically grown, and this share has been on the increase in recent years (Hough et al., 2003). In Iceland, 'domestically cultivated marijuana has become increasingly competitive with imported marijuana, and current estimates indicate it makes up anywhere from 10 to 50 percent of the total cannabis market' (INCB, 2005). Again, this trend appears to be occurring in a number of other developed countries as well. In 1986, it was estimated that one-sixth of cannabis consumed in the USA was produced within the country (President's Commission on Organized Crime, 1986), whereas more recent estimates are closer to a third (Williamson, 2005), and it would appear that this trend is continuing (National Drug Intelligence Center, 2005 and 2007). In Canada in 1985, only 10% of the cannabis consumed was produced domestically (Stamler et al., 1985), but by 2002 it was estimated that 'well over half' was Canadian grown (RCMP, 2002).

In most developed countries, an increase in the share of domestic production means an increase in the share of indoor production, and thus an increase in sinsemilla in the

market^(?). Unfortunately, time-series data on the share of the herbal cannabis market commanded by *sinsemilla* in Europe are scant. In discussing the results of their surveys of regular cannabis users, Atha *et al.* concluded that ‘skunk’ (*sinsemilla*) was the only type of herbal cannabis to improve its market share in the United Kingdom between 1994 and 1997, up just under 10% (Atha, 2002). *Sinsemilla* is now said to comprise about half of the United Kingdom and Irish herbal markets (King *et al.*, 2004). Outside Europe, the share of eradicated cannabis cultivation operations that are located indoors in the USA has increased in recent years, from 2% indoor in 1985 (DEA, 2005) to more than 6% in 2005 (National Drug Intelligence Center, 2006). According to the US National Drug Threat Assessment 2005, the prevalence of *sinsemilla* is continuing to grow in the USA (National Drug Threat Intelligence Center, 2005). In Canada between 1997 and 2000, some 78% of cannabis production operations detected in British Columbia, which produced over 40% of the detected cultivation operations in Canada, were indoors. The number of detected indoor operations tripled during the same time period (Plecas *et al.*, 2002). On a national level, a slightly lower share of all operations detected were indoors (RCMP, 2002). In New Zealand, the number of national survey respondents who had ever used ‘skunk’ increased from 10% in 1998 to 14% in 2001 (Wilkins *et al.*, 2002). After many years of winning market share from both imports and a remarkable outdoor industry, hydroponic production is now also the most commonly detected method of cultivating cannabis in Australia (Australian Crime Commission, 2004, reconfirmed in Australian Crime Commission, 2007).

Cultivation for personal use is also a significant source of supply in many areas, and in many developed countries this is likely to mean indoor cultivation. In the United Kingdom, one study found that 63% of a sample of regular users reported having grown the drug at some point in their lives, growing an average of 24 plants. The authors estimated that 30% of the cannabis used by regular users in the UK was home-grown in 1997 (Atha *et al.*, 1999). In Spain, legal constraints on carrying — but not consuming — cannabis have led to an increase in production for personal consumption since 1992 (Gamella and Jimenez Rodrigo, 2004). Cultivation for personal use is also common outside Europe, in Oceania, for example. In New Zealand, a household survey found that 10% of all current users grew at least some of their own supply (Wilkins *et al.*, 2002). The share of people cultivating for personal use is much higher among those who use the drug frequently. A survey of regular users in Australia found that two-thirds of respondents grew some cannabis for their own use, and nearly half grew all or most of the cannabis they used (Reilly *et al.*, 1998).

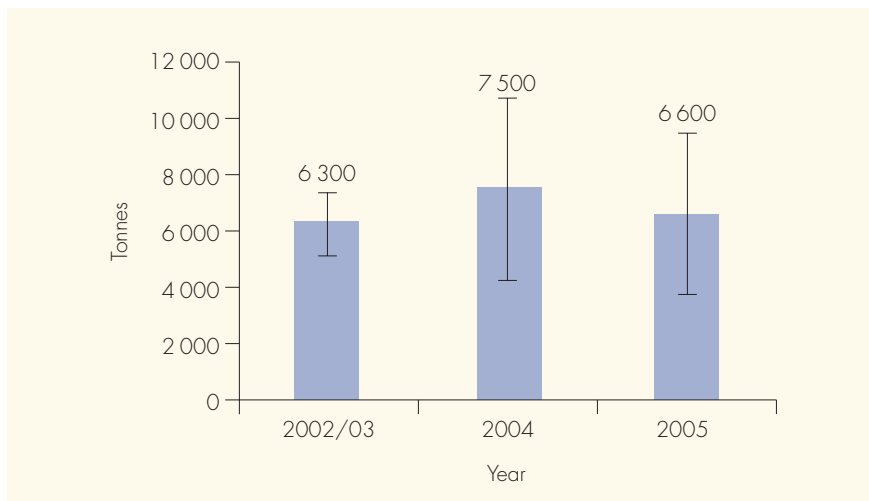
^(?) The terminology in this area can be confusing. While it is possible to produce seeded cannabis indoors, most indoor operations of any scale produce *sinsemilla*, and as do nearly all hydroponic operations. And while there is extensive outdoors production inside consumer countries like the USA, in many developed countries there is a substantial overlap between domestically produced cannabis and indoor-produced cannabis, due to poor climate and the presence of law enforcement, as well as a desire to enhance yield and potency through available technology. The term ‘skunk’ is also used for high potency strains of cannabis in parts of Europe and Oceania, a reference to an early ‘*Indica/Sativa*’ cultivar that forms the basis of many modern breeds.

Cannabis resin production

Global cannabis resin production estimates are derived from estimates of hashish production in key producing countries, seizure information and intelligence information about the importance of various markets. Another approach has been to estimate cannabis resin production backwards from estimated cannabis herb production, applying the global distribution of cannabis resin to cannabis herb seizures. The two approaches give a range of the likely cannabis resin production from 3 800 to 9 500 tonnes for 2005, and a mid-point estimate of around 6 600 tonnes. Previous year's estimates, based on the same methodology, resulted in a range from 4 200 to 10 700 tonnes with a mid-point estimate of some 7 500 tonnes. These results reflect falling cannabis resin production in the world's largest hashish producing country, Morocco. The declines in Morocco were, however, partially offset by rising levels of cannabis resin production in other parts of the world, notably Afghanistan. As a side-product of the annual village surveys undertaken as part of UNODC's Afghanistan Opium Survey, data on the area of cannabis cultivation are also collected. These surveys found that the area under cannabis (resin) cultivation in Afghanistan rose from some 30 000 hectares in 2004 to 50 000 hectares in 2005–2006 and 70 000 hectares in 2007 (UNODC, 2007, and UNODC, Afghanistan 2007) (Figure 5).

Attempts to break down global cannabis resin production in 2002–2003 suggested that more than 40% of the global cannabis resin supply is being produced in northern Africa and more than a quarter in the Near East and Middle East. These two regions thus

Figure 5: Global cannabis resin production



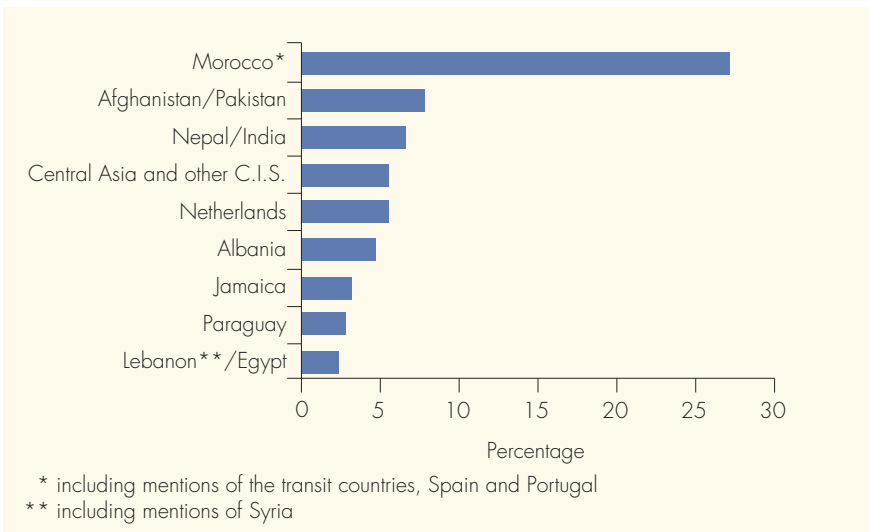
Sources: UNODC estimates based on UNODC and government of Morocco cannabis surveys 2003, 2004 and 2005 and UNODC annual reports questionnaire data.

accounted for more than two-thirds of global cannabis resin production. Central Asia and South Asia accounted for less than 10% each; South-East Europe for some 5% and the Caribbean for some 3% of global production (UNODC, 2005).

When UN Member States were asked about the source of cannabis resin in their countries, Morocco was also the most often cited country (27% of all mentions over the period 2003–2005 period), followed by Pakistan and Afghanistan. Other important source countries identified are Nepal and India, the Commonwealth of Independent States (CIS) countries, notably Kazakhstan and Kyrgyzstan, the Netherlands and Albania in Europe, Jamaica and Paraguay in Latin America, as well as the Lebanon and Egypt in the Near East. If compared with a similar exercise done previously, data suggest that the importance of Morocco is declining: 31% of all mentions over the 1999–2003 period versus 20% in 2005 (UNODC, 2007) (Figure 6).

Morocco remains, nonetheless, the world’s most significant cannabis resin exporter. In recent years, about 80% of cannabis resin seized in Western Europe originated in Morocco. By 2005–2006, it is estimated that this proportion declined to around 70%. Since resin is the primary form of cannabis consumed in most of Europe, an analysis of

Figure 6: Main source countries of cannabis resin, 2003–2005 (based on information from 61 countries)



Note: the percentages reflect the number of times a country was identified — by other countries — as a major source country for cannabis resin, expressed as a proportion of all such mentions. Source: UNODC annual reports questionnaire data, other government reports and UNODC estimates.

cannabis production for the European market must focus on Morocco (see Gamella and Jiménez Rodrigo, this monograph).

UNODC and the government of Morocco conducted comprehensive cannabis resin surveys of the country in 2003, 2004 and 2005. The resulting estimates are based on the analysis of satellite photos (SPOT 5 and IKONOS) ⁽³⁾ covering the whole of the Rif area of northern Morocco, and subsequent ground truthing. The 2003 survey placed total resin production at about 3 070 tonnes, cultivated on 134 000 hectares of land in the Rif region (equivalent to 10% of the total land or 27% of the agricultural area in the five provinces ⁽⁴⁾ investigated) by some 96 600 families, providing income for some 800 000 people in the region. This was significantly higher than the previously estimated 80 000–85 000 hectares for the late 1990s by the EU (US Department of State, 2000) or the 44 500 hectares estimated by the Moroccan authorities in 1995 ⁽⁵⁾.

The 2004 survey showed a 10% decline in the land dedicated to cannabis cultivation (120 500 hectares) compared with a year earlier, with production falling to 2 760 tonnes (UNODC, 2004) ⁽⁶⁾. This decline was mainly due to lower levels of cannabis cultivation in the provinces of Taounate (–43%) and Al Hoceima (–54%), an indirect consequence of the earthquake in early 2004, which led to increased ‘interest’ and assistance by the authorities. Most cannabis was produced in the province of Chefchaouen (50% in 2003, 62% in 2004) (Figure 7).

The 2005 survey showed a further strong decline (–40%) in the area dedicated to cannabis cultivation in Morocco to 72 500 hectares. Cannabis resin production declined to 1 066 tonnes. The area under cultivation was, thus, also lower than the levels in the late 1990s. Declines were reported from most provinces, including Chefchaouen (–46%). The largest areas under cannabis cultivation continued to be in the province of Chefchaouen (56% of total), followed by Taounate (17%) and Al Hoceima (16%).

The overall area dedicated to cannabis cultivation in Morocco in 2005 was less than the area found in a previous UNODC cannabis survey in Kazakhstan (330 000 hectares in 1998–1999; though most of this was ‘wild cannabis’) (UNODCCP, 1999) and less than opium-poppy cultivation in Afghanistan in 2005 (104 000 hectares) but more than opium-poppy cultivation in Myanmar (32 800 hectares) or Laos (1 800 hectares). It was

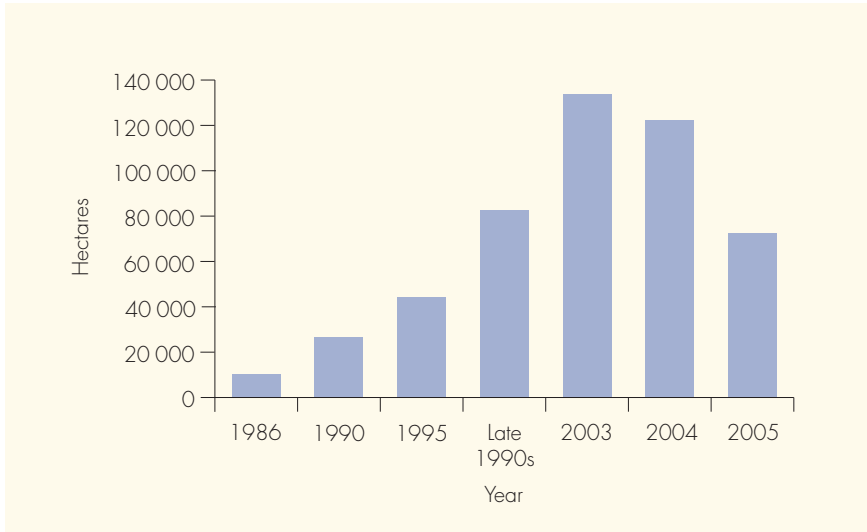
⁽³⁾ The survey was based on the analysis of 16 SPOT5 (multi-spectral, 10m resolution) and 13 IKONOS (panchromatic, 1 m resolution).

⁽⁴⁾ The five provinces were Al Hoceima, Chefchaouen, Larache, Taunate and Tétouan.

⁽⁵⁾ It should be noted, though, that all cultivation estimates prior to 2003 have not fulfilled strict scientific criteria and must thus be treated with caution.

⁽⁶⁾ Some of the decline appears to have been a consequence of an earthquake, resulting in increased attention being given by the national authorities and the international community to the region concerned.

Figure 7: Area under cannabis cultivation in Morocco, 1986–2005



Sources: UNODC, Maroc — *Enquête sur le cannabis 2005*, January 2007; UNODC, Maroc — *Enquête sur le cannabis 2004*, May 2005; UNODC annual reports questionnaire data; United States Department of State, Bureau for International Narcotics and Law Enforcement Affairs, *International narcotics control strategy report*, March 2000.

also less than the area under coca cultivation in Colombia (860 000 hectares), but more than the area under coca cultivation in Peru (48 200 hectares) or Bolivia (25 400 hectares) in 2005 (UNODC, 2007).

The yield estimates for 2004 were based on a scientific study, conducted on 30 plots across the five provinces. The yield on rain-fed land was found to amount to 750 kg/ha; the yield on irrigated land was, on average, 1 270 kg/ha in 2004. The rain-fed area amounted to 106 100 hectares; the irrigated area was 14 500 hectares. The overall yield of herbal material amounted, thus, to 813 kg/ha. Total production of cannabis material was estimated at 98 000 tonnes. Out of this cannabis material the farmers produced 1 019 tonnes of first-quality resin, 921 tonnes of second-quality resin and 823 tonnes of third-quality resin, that is, in total some 2 760 tonnes of cannabis resin. This was equivalent to 2.8% of all cannabis material (UNODC Morocco, 2007).

A subsequent yield survey, conducted in 2005, based on data from 87 plots across the cannabis producing provinces, found overall lower results. While average cannabis production on irrigated land increased to 1 821 kg/ha, due to an increasing concentration of cannabis production in more fertile areas of the Rif region, cannabis production on non-irrigated land declined, due to a drought, to just 459 kg/ha. Given the distribution between irrigated and non-irrigated land in the Rif area (14 750 hectares

irrigated; 57 728 hectares non-irrigated), the overall average yield amounted to 735 kg/ha, yielding 53 300 tonnes of raw cannabis. The conversion ratio from dried raw material to cannabis resin — based on the analysis from 87 plots — fell to 2 kg of cannabis resin per 100 kg of cannabis raw material in 2005, down from 2.8 kg in 2004. Total cannabis resin production thus amounted to 1 066 tonnes in 2005, down from 2 760 tonnes a year earlier (UNODC Morocco, 2007).

In parallel to the decline in production, cannabis farm gate prices doubled, from 25 Dh/kg in 2004 to 50 Dh/kg in 2005 (i.e. from EUR 2.3/kg to EUR 4.5/kg); cannabis resin farm gate prices almost tripled, from 1 400 Dh/kg in 2004 to 4 000 Dh/kg in 2005 (i.e. from EUR 127/kg to EUR 363/kg) (UNODC Morocco, 2007). No such price changes were, however, reported from European countries in 2005 (UNODC Morocco, 2007).

The income for the farmers from the production of cannabis resin was around EUR 260 million in 2004, equivalent to 0.7% of GDP. In 2005, high prices led to an increase to EUR 325 million. The amount of money earned with this Moroccan cannabis resin in Western Europe (deducting seizures made in Morocco and in Western Europe) was estimated at around EUR 10.8 billion in 2004. As cannabis resin prices were not reported to have increased significantly in European countries in 2005, the value of the smaller amounts of cannabis exported from Morocco and sold on European markets is estimated to have declined to some EUR 4.6 billion in 2005 (UNODC Morocco, 2007).

The analysis of the THC content, done by the Laboratoire de Recherches et d'Analyses Techniques et Scientifiques, MARATES, based on samples from the 30 plots in 2004, revealed that the dry cannabis leaf had, on average, a THC content of 1.2%; the dried flowering tops had a THC content of on average 2.7% (confidence interval 2.1–3.4%) and the cannabis resin had on average a THC content of 8.3% (confidence interval 7.1–9.4%) with a THC content of the samples analysed from 5.5 to 11.3% (UNODC Morocco, 2005).

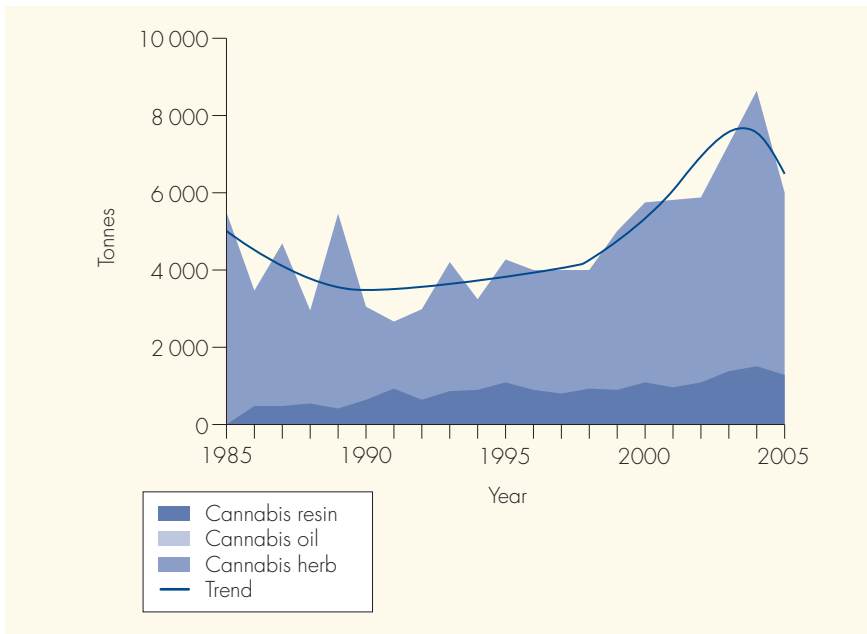
Trafficking

Survey data from a number of countries suggest that much of the cannabis consumed is not 'trafficked' in the traditional sense of the word, but rather grown on a small scale and distributed within social networks. As discussed above, cultivation for personal use is widespread in many countries. In the United Kingdom, Atha et al. note that 'most home grown (cannabis) is not sold' and they estimate that 30% of the cannabis used by regular users in the UK was home-grown in 1997 (Atha et al., 1999). If this is correct, a significant share of the cannabis used in the UK at that time was produced and distributed free within the country. A second study concurs, 'domestic production is

on the increase and as much as half of the cannabis consumed in England and Wales may be grown here. Some cultivation is on a commercial basis, but much is on a small scale, for personal use or use by friends' (Hough et al., 2003). As this second study suggests, what these small growers do not use or give away, they often sell within their social circle. According to survey data from the United States National Survey on Drug Use and Health, most (78%) of those who say they bought the drug in the last year say they bought it from 'a friend'. Similar figures were found in an international comparative study of cannabis users in Bremen (80%) and San Francisco (95%) (Borchers-Tempel and Kolte, 2002) (7). The 2006 National Survey on Drug Use and Health revealed that 53% of the persons who used cannabis in the last year at least once, obtained it most recently for free (i.e. they shared someone else's cannabis); 42.8% bought it; 1.19% traded something for it; and 0.9% grew it themselves (SAMHSA, 2007). Distribution along social lines thus undercuts many of the negative effects associated with drug markets dominated by organised crime, but it also facilitates access to the cannabis market.

In terms of volume, cannabis remains the most extensively trafficked drug worldwide. Expressed in drug units (doses), 70% of all drug units seized in 2003 concerned

Figure 8: Global cannabis seizures, 1985–2005



Source: UNODC, annual reports questionnaire data/DELTA.

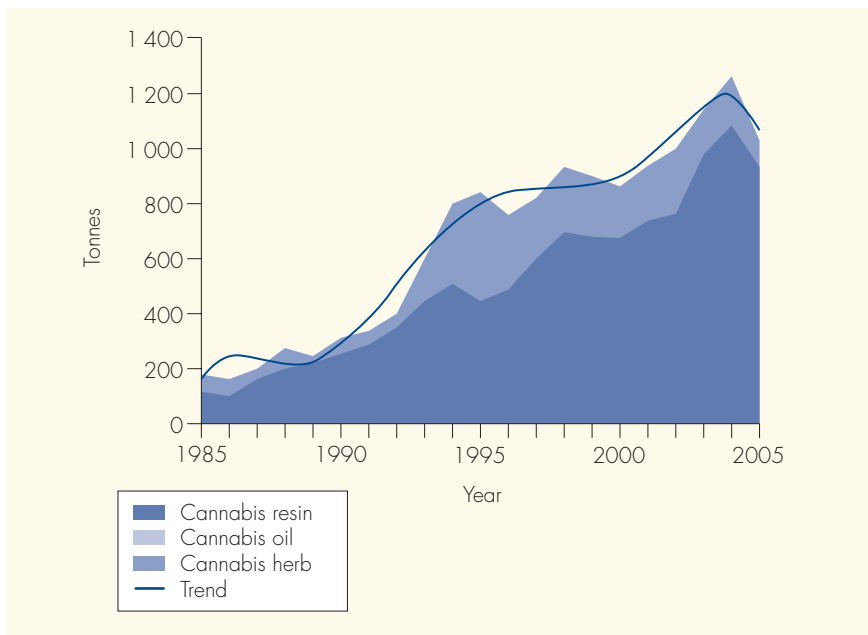
(7) This study also included users in Amsterdam, most of whom bought their cannabis from a coffee shop.

cannabis (DELTA, 2005). By 2005, this proportion declined, however, to 59%, followed by cocaine (24%), opiates (12%) and amphetamines (4%) (UNODC, 2007). In contrast to other drugs, most of the cannabis-related trafficking arrests — in most countries — are accounted for by nationals of the respective country (DELTA, 2007).

Cannabis end-product seizures showed a small downward trend in the late 1980s, strong increases in the 1990s and in the first years of the new millennium, but declined by 31% in 2005 to around the levels reported in 2002. Cannabis herb seizures amounted to 4 644 tonnes, cannabis resin to 1 302 tonnes and cannabis oil to 0.7 tonnes in 2005. Cannabis herb seizures thus accounted for 78% of all cannabis end-product seizures in 2005. In addition, 32 million cannabis plants and more than 600 tonnes of cannabis plant material were seized worldwide in 2005. This corresponded to a decline of close to 70% compared with 2003 (DELTA, 2007) (Figure 8).

Following years of increase in the 1980s, the 1990s and the first years of the new millennium, cannabis seizures declined by 18% in Europe in 2005. While cannabis herb is the predominant type of cannabis product found globally, cannabis resin is the predominant form of cannabis seized in Europe, accounting for almost 90% of all cannabis end-product seizures in 2005. Most of these seizures have been made by the Spanish authorities (Figure 9).

Figure 9: Cannabis seizures in Europe, 1985–2005



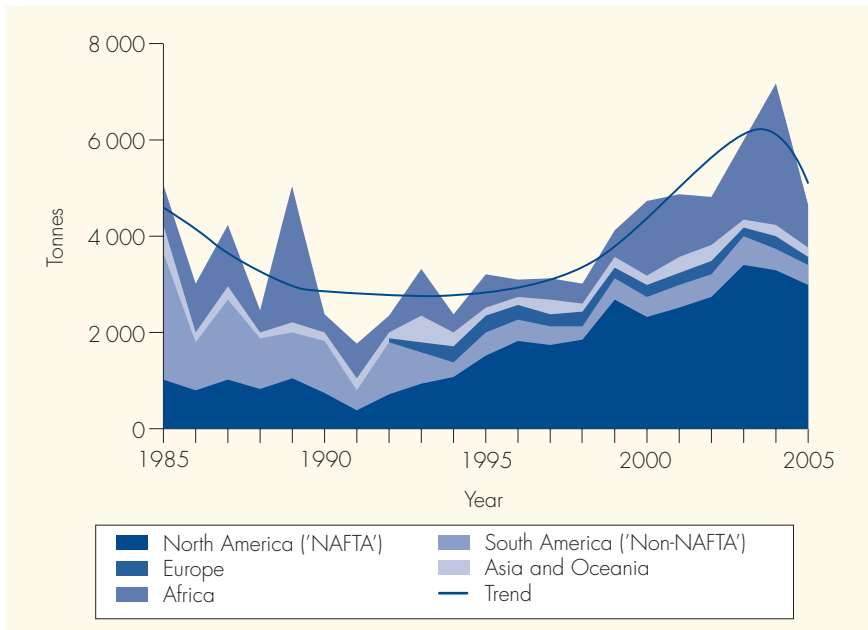
Source: UNODC, annual reports questionnaire data/DELTA.

The global market for cannabis herb in 2003 was estimated at production level to amount to some EUR 8 billion, at the wholesale level to some EUR 28 billion and at the retail level to some EUR 107 billion. The global market for cannabis resin was estimated at the production level to amount to some EUR 0.6 billion, at the wholesale level to some EUR 10 billion and at the retail level to some EUR 27 billion in 2003. In value terms, the cannabis market accounted for 44% of the global drug market (EUR 304 billion) while in terms of the number of drug users (161 million) about 80% of all drug users (200 million) were estimated to consume cannabis (UNODC, 2005). Though no new estimates are available, one could assume that the global cannabis market in 2005 was of similar magnitude.

Trafficking in cannabis herb

More cannabis herb is seized, in a wider range of locations, than any other drug in the world. Out of 182 countries and territories reporting seizures to UNODC over the 2003–2005 period, 165 reported seizures of cannabis herb, more than for heroin (150), cocaine (150), cannabis resin (119), amphetamines (96) or ecstasy (97). Cannabis herb seizures declined, however, by 35% in 2005 to the levels reported in 2000, but were still 92% higher than in 1990 (DELTA, 2007) (Figure 10).

Figure 10: Cannabis herb seizures — regional breakdown, 1985–2005



Source: UNODC, annual reports questionnaire data/DELTA.

In 2005, 63% of global cannabis herb seizures occurred in North America, followed by Africa (18%) and South America ('non-NAFTA') (11%). The remainder took place in Asia (5%), Europe (2%) and the Oceania region (0.1%). This distribution of seizures, with most cannabis herb seizures being reported from North America followed by Africa and South America, has been consistent for most years since 1994. The proportion of seizures made in North America rose from 32% in 1990 to 63% in 2005 reflecting stronger efforts to fight cannabis trafficking, while the proportion of seizures made in South America declined over the same period from 46% to 11% as cannabis production increasingly shifted to North America, where cannabis with a higher THC content is being produced. The proportion of seizures made in Africa increased from 16% of global cannabis herb seizures in 1990 to a peak of 41% in 2004 (DELTA, 2007), in line with reports of ever larger areas under cannabis cultivation. In 2005, however, the proportion fell back to 18% as eradication efforts were intensified in a number of countries. This decline in cannabis herb production may not be sustainable, however (UNODC, 2007).

The world's largest cannabis herb seizures in 2005 were made by the law enforcement agencies of Mexico (1 781 tonnes or 38% of the total), followed by those of the USA (1 112 tonnes, or 24% of the total). These two countries have led the world in cannabis seizures since 1994 (except for the year 2000, when the USA ranked fifth). The next largest seizures in 2005 were reported by South Africa (6% of total), followed by Brazil, Tanzania, India, Colombia and Nigeria (3% each). The largest seizures among European countries were shown by the Russian Federation (rank 15), followed by the UK (rank 18) (DELTA, 2007).

The share of Europe in global cannabis herb seizures increased from 1% in 1985 to 13% in 1994 as consumption increased, before falling gradually back to 2% of global seizures by 2005. In 2005, cannabis herb seizures declined in Europe by 40% compared with a year earlier, thus exceeding the global decline in that year (-35%). Declines were also reported from Africa, North America and the Oceania region, while seizures increased in Asia and in South America (DELTA, 2007). The decline of cannabis herb seizures in Europe seems to reflect primarily changes in law enforcement priorities in a number of European countries. In addition, the decline may have been due to a decline in cannabis herb imports into Europe, as supply is increasingly shifting towards domestic sources. The fall in seizures does not appear to be due to any significant decline in consumption. Lifetime usage among 15- to 16-year-olds in Europe increased by more than 80% between 1995 and 2003 (UNODC, 2005) and cannabis use also increased among the general population over the last decade. In recent years, cannabis use seems to have reached a plateau in several European countries and started falling in others. However, these declines have been far less important than the reported declines in seizures (UNODC, 2007).

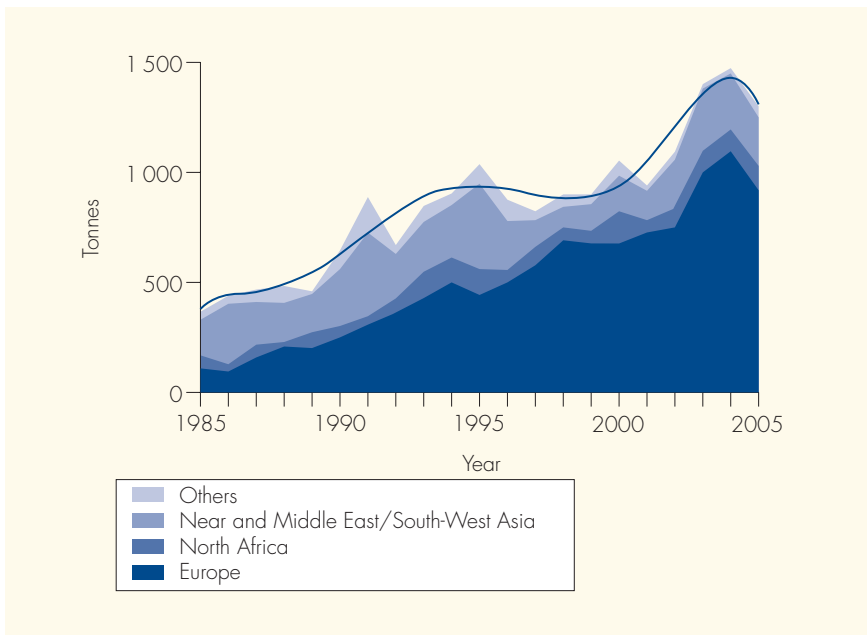
Trafficking in cannabis resin

Global cannabis resin seizures declined in 2005 by 11 % compared with a year earlier, dropping to 1 302 tonnes, below the levels reported in 2003. Resin seizures declined at a rate above average in Europe (–15%), reflecting falling levels of cannabis resin production in Morocco (DELTA, 2007).

Out of global cannabis resin seizures, Europe accounted for 922 tonnes, of which 916 tonnes (70% of the total) was seized in West and Central Europe, 18% in the Near and Middle East/South-West Asia and 8% in North Africa. The largest seizures worldwide were reported by Spain (670 tonnes, or 51 % of the total), followed by Pakistan (94 tonnes, or 7%), Morocco (92 tonnes, or 7%). Significant amounts were also seized by the authorities in Iran (69 tonnes, or 5%) and Afghanistan (42 tonnes, or 3%) (DELTA, 2007). The largest seizures in Europe, after Spain, were reported by France (6 % of total in 2005), the UK (5%), Portugal (2%) and Italy (2%) (Figure 11).

The main destination of cannabis resin is West and Central Europe. About 70% of the cannabis resin destined for the West and Central European market in 2005–2006 is estimated to have originated in Morocco, down from around 80% a few years earlier (UNODC, 2007). Much of the cannabis resin transits Spain and the Netherlands before

Figure 11: Cannabis resin seizures — regional breakdown, 1985–2005



Source: UNODC, annual reports questionnaire data/DELTA.

being shipped to other countries (see Gamella and Jiménez Rodrigo, this monograph). Most of the remainder of the resin supply originates in Afghanistan/Pakistan (e.g. 59% in Greece, 30% in Turkey, 30% in the Czech Republic, 14% in Belgium, less than 10% in France and Italy), in Central Asia (mostly for the Russian Federation, other CIS states and some of the Baltic countries) or from within Europe (mainly Albania, supplying the markets of various Balkan countries and Greece) (DELTA, 2007).

The second-largest destination of cannabis resin is the Near and Middle East/South-West Asia region. This region is mainly supplied from cannabis resin produced in Afghanistan and Pakistan and, to a lesser degree, from cannabis resin originating in Lebanon. Some of the cannabis resin from Afghanistan/Pakistan is also being shipped to Canada and to countries in Eastern Africa.

North Africa makes up the third-largest market and is predominantly supplied by cannabis resin produced in Morocco. The importance of other markets is limited. Nepal is a source country for cannabis resin exports to India and to some other countries and Jamaica is a source country for cannabis resin exports to some other countries in the Americas.

More research required

Generating sound estimates of global cannabis production levels is likely to remain a slippery subject for many years to come, but there are several areas where data could be improved greatly:

- There is a need for more scientific surveys on the areas under cannabis cultivation. These should help to identify the areas under 'wild cannabis' and the areas where cannabis is cultivated, on irrigated and on rain-fed land. This may be expensive, but remote sensing technology is becoming more readily available and is being used in other areas of agriculture. Using a sampling approach, a growing number of countries should be in a position to undertake such surveys if control of cannabis cultivation is deemed a priority. Where satellite imagery is not available, UNODC has developed methods to identify illicit crops by means of a sampling approach and helicopter over-flights, as well as through ground surveys. The 'know-how' for such surveys is readily available in UNODC to be shared with Member States. The situation is more difficult when it comes to indoor cultivation which, in general, cannot be identified through the analysis of satellite photos or helicopter over-flights. Nonetheless, more reliable estimates on the extent of outdoor cultivation of cannabis could form the basis for reasonably good estimates on the likely extent of such indoor cultivation activities, in combination with eradication data and forensic analyses of cannabis seizures.

- There is also a need for scientific yield data across a wide typology of cultivars and cultivation styles. Feral or semi-cultivated strains found in Kazakhstan are likely to differ greatly in productivity when compared with intensively grown cannabis in Morocco, or informal plots in South Africa, or indoor operations in Canada. These figures will remain imprecise, but at the very least, a plausible range of values needs to be compiled.
- Distinction between the various cannabis products is essential: a standardised definition of sinsemilla would be useful to differentiate this drug from other herbal cannabis.
- The quality of reported seizure data should be analysed. One possible source of the discontinuity between supply- and demand-based production estimates could be inflated seizure data, based on either inaccurate plant-to-product conversion rates or the inclusion of bulk plant material not suitable for sale. Finally, there is a general danger of double counting once various law enforcement bodies are involved.
- There remains a need to analyse, on a systematic basis, the THC content of cannabis found on the market, and its development over time. Standards to undertake such analyses in an internationally comparable way would need to be developed. Forensic analysis could also help to identify the sources of the cannabis.
- It would also be useful to have studies made of the distinction between the drug as sold and the drug as used. Herbal cannabis users, including sinsemilla users, clean their product before consumption. This could help to explain some of the significant differences between supply and demand-side estimates.

On the demand side, more data are required on cannabis consumption (amounts consumed per cannabis user). While some data exist on the number of days of use amongst annual users, the data on volumes consumed remain dubious. Scientific study needs to be made of the standard dose for inexperienced users and the rate and extent to which tolerance develops. In addition to this, empirical observation of actual use patterns needs to be made across a wide range of cultural contexts. User surveys would benefit if they were to distinguish between herbal cannabis and cannabis resin consumption.

Bibliography

- Abel, S. (1997), 'Cannabis policy in Australia and New Zealand', *Drug and Alcohol Review* 16(4): 421–428.
- Alpers, P. (2005), 'Gun-running in Papua New Guinea: from arrows to assault weapons in the Southern Highlands', *Small Arms Survey Special Report No. 5*, Small Arms Survey, Geneva, 62.
- Atha, M. (2002), *Cannabis use in Britain*, Independent Drug Monitoring Unit Publications, Wigan.
- Atha, M., Blanchard, S., Davis, S. (1999), *Regular users II: UK drugs market analysis, purchasing patterns, and prices, 1997*, Independent Drug Monitoring Unit Publications, Wigan.

- Australian Crime Commission (2004), *Illicit Drug Data Report 2003/4*, government printers, Canberra, 34.
- Australian Crime Commission (2007), *Illicit Drug Data Report 2005/6*, government printers, Canberra.
- Borchers-Tempel, S., Kolte, B. (2002), 'Cannabis consumption in Amsterdam, Bremen, and San Francisco: a three-city comparison of long-term cannabis consumption', *Journal of Drug Issues* 32(2): 395–412.
- Bundeskriminalamt (2005), *Bundeslagebild Rauschgift 2004: Bundesrepublik Deutschland*, May, 44.
- Bureau for International Narcotics and Law Enforcement Affairs (2005), *International Narcotics Control Strategy Report*, Department of State, Washington.
- Clarke, R. (1981), *Marijuana Botany*, Ronin, Berkeley.
- Clarke, R. (1998), *Hashish!*, Red Eye Press, Los Angeles.
- DELTA (2005), United Nations Office on Drugs and Crime DELTA database.
- DELTA (2007), United Nations Office on Drugs and Crime DELTA database.
- Drug Availability Steering Committee (2002), *Drug availability estimates in the United States*, government printers, Washington.
- Drug Enforcement Administration of the United States (DEA) (2003), *Country profile: Mexico*, DEA Drug Intelligence Briefs, Department of Justice, Washington.
- Drug Enforcement Administration of the United States (DEA) (2005), *Annual crop eradication figures*, Department of Justice, Washington.
- Gamella, J., Jiménez Rodrigo, M. (2004), 'A brief history of cannabis policies in Spain (1968–2003)', *Journal of Drug Issues* 34(3): 623–660.
- Haney, A., Bazzaz, F. (1970), 'Some ecological implications of the distribution of hemp (*Cannabis sativa* L.) in the United States of America', in Joyce, C., Curry, S. (eds), *The botany and chemistry of cannabis*, Churchill, London, 39.
- Hough, M., Warburton, H., Few, B., May, T., Man, L., Witton, J., Turnbull, P. (2003) *A growing market: the domestic cultivation of cannabis*, Joseph Rowntree Foundation, York.
- INCB (2005), *Report of the International Narcotics Control Board for 2005*, International Narcotics Control Board, Vienna.
- King, L., Carpentier, C., Griffiths, P. (2004), *An overview of cannabis potency in Europe*, Insights Series No. 6, European Monitoring Centre for Drugs and Drug Addiction, Lisbon.
- King, R., Mauer, M. (2005), *The war on marijuana: the transformation of the war on drugs in the 1990s*, The Sentencing Project, Washington.
- National Drug Intelligence Center (2005), *National drug threat assessment 2005*, United States Department of Justice, Washington.
- National Drug Intelligence Center (2006), *National drug threat assessment 2006*, United States Department of Justice, Washington.
- National Drug Intelligence Center (2007), *National drug threat assessment 2007*, United States Department of Justice, Washington.
- Niesink, R., Rigter, S., Hoek, J. (2005), *THC-concentraties in wiet, nederwiet en hasj in Nederlandse coffeeshops (2004–2005)*, Trimbos Institute, Utrecht.
- Observatoire Géopolitique des Drogues (2000), *Annual report 1998/1999*, 61.
- Office of National Drug Control Policy (ONDCP) (2000), *What America's users spend on illegal drugs, 1988–1998*, Office of the Presidency, Washington, 22.
- Plecas, D., Dandurand, Y., Chin, V., Segger, T. (2002), *Marihuana growing operations in British Columbia: an empirical survey*, International Centre for Criminal Law Reform and Criminal Justice Policy, Vancouver.
- President's Commission on Organized Crime (1986), *America's habit: drug abuse, drug trafficking, and organized crime*, Washington.

- Reilly, D., Didcott, P., Swift, W., Hall, W. (1998), 'Long-term cannabis use: characteristics of users in an Australian rural area', *Addiction* 93: 837–846.
- Royal Canadian Mounted Police (RCMP) (2002), *Marihuana cultivation in Canada: evolution and current trends*, Criminal Intelligence Directorate, Ottawa.
- Royal Canadian Mounted Police (RCMP) (2004), *The drug situation in Canada*, Criminal Intelligence Directorate, Ottawa.
- SAMHSA (2007), *National survey on drug use and health 2006*, Substance Abuse and Mental Health Services Administration, Rockville.
- Second Technical Conference on Drug Control Research (2004), Vienna, 19–21 July.
- Stamler, R., Fahlman, R., Vigeant, H. (1985), 'Illicit traffic and abuse of cannabis in Canada', *Bulletin on Narcotics* 37(4): 37–49.
- United Nations Drug Control Programme (UNDCP) (1997–1998), 'Cannabis as an illicit narcotics crop: a review of the global situation of cannabis consumption, trafficking and production', *Bulletin on Narcotics* 49 (1 and 2) (1997) and 50 (1 and 2) (1998), *Double issue on cannabis: recent developments*, 45–83.
- UNODCCP (1999), 'The value of drug seizure data as an analytical tool', in *Global Illicit Drug Trends 1999*, United Nations Office for Drugs Control and Crime Prevention, Vienna, 16–17.
- UNODC (Morocco, 2005), *Maroc Enquête sur le cannabis 2004*.
- UNODC (Morocco, 2007), *Maroc Enquête sur le cannabis 2005*.
- UNODC (Afghanistan, 2007), *Afghanistan opium survey 2007, executive summary*, August.
- UNODC (2004), *World drug report 2004*, United Nations Office on Drugs and Crime, Vienna.
- UNODC (2005), *World drug report 2005*, United Nations Office on Drugs and Crime, Vienna.
- UNODC (2006), *World drug report 2006*, United Nations Office on Drugs and Crime, Vienna.
- UNODC (2007), *World drug report 2007*, United Nations Office on Drugs and Crime, Vienna.
- UNODC (ARQ), Annual Reports Questionnaire data.
- United States Department of Justice (2007), *Domestic cannabis cultivation assessment 2007*, National Drug Intelligence Center.
- US Department of State (2000), *1999 International Narcotics Control Strategy Report*, Bureau for International Narcotics and Law Enforcement Affairs, Washington.
- United States Drug Enforcement Agency (2003), *Mexico: country profile for 2003*, Department of Justice, Washington, 12–13.
- University of Mississippi (2007), *Cannabis potency monitoring project report 95*, January.
- Wilkins, C., Casswell, S., Bhatta, K., Pledger, M. (2002), *Drug use in New Zealand: national surveys comparison 1998 and 2001*, Alcohol and Public Health Research Unit, University of Auckland, 31.
- Williamson, C. (2005), Personal communication, 7 September, Office of National Drug Control Policy, Washington.

Chapter 13

Monitoring cannabis availability in Europe: issues, trends and challenges

Keywords: availability – cannabis – market – prices – supply

Setting the context

In most of Europe, few would argue that cannabis is difficult to obtain for those who seek to use it. Nonetheless, when looking at issues of supply and demand, sellers and buyers, products and distribution, there are numerous pieces of the picture which need to be assembled to gain an insight into how policymakers may tackle the drug's distribution. This chapter looks at the broader concept of *availability* of cannabis, a concept that goes beyond market analysis and embraces further issues such as price and the perceived ease of purchasing a drug.

Cannabis is the most frequently used illicit drug in the EU. Some commentators have suggested that the drug has become more readily available, yet the concept of availability is one that is both difficult to define and to measure. Nonetheless, it is possible to look at a number of indirect indicators that, when taken together, allow for the construction of a more general picture of cannabis availability in Europe.

In this chapter, data on drug seizures, prices, potencies and perceived availability among the general public are used to explore overall trends in the availability of cannabis products in Europe between 1998 and 2003. Analysis is presented for EU Member States and Norway.

Data analysis at this level is always challenging and a range of methodological issues and data limitations means that conclusions must be drawn with caution. In particular, the amount of missing data on some measures presents a serious problem for analysis. Despite these difficulties some clear trends do seem evident in some of the indicators. However, when taken together no coherent picture emerges, with some datasets supporting the assumption that cannabis availability has been increasing whilst other information suggests a more stable situation.

Further reading

Cyclical sources of data on drug supply

- EMCDDA, Annual reports and Statistical bulletin, European Monitoring Centre for Drugs and Drug Addiction, Lisbon (published annually in November).
- UNODC, World drugs reports and Interactive seizure reports, United Nations Office on Drugs and Crime, Vienna.
- World Customs Organisation, Customs and drugs reports (published annually in June).

General reading

- Gouvis Roman, C., Ahn-Redding, Simon, R. (2007), *Illicit drug policies, trafficking, and use the world over*, Lexington Books, Lanham.
- UNODC (1987), *Recommended Methods for Testing Cannabis*, United Nations Office on Drugs and Crime, Vienna.

Monitoring cannabis availability in Europe: issues, trends and challenges

Chloé Carpentier, Meredith Meacham and Paul Griffiths

Towards a conceptual framework for exploring drug availability — approaches and data sources

The availability of illicit drugs is an important concept for drug policy, and reducing availability can be found as an explicit policy objective at both European and national levels (1).

Rationale

Policy interest in drug availability can be broadly characterised as focusing on two topics. The first topic is the relationship between availability and demand and rests upon an implicit assumption that changes in the availability of drugs will be associated in some way with levels of use. At EU level this has resulted in a fairly pragmatic monitoring strategy of collecting and analysing information that may allow changes over time in drug availability to be charted. Currently, as described below, EMCDDA activities in this area focus on improving the reliability and comparability of data sources to allow better monitoring of trends in availability at street level for the more prominent groups of drugs.

The second topic of interest is to understand what factors can have an impact on the availability of different drugs, in order to inform the development of interventions with the aim of addressing these factors. Answering this sort of question goes beyond simply monitoring and requires more complicated research or statistical modelling exercises.

(1) Drug availability appeared in the EU political debate in the mid- to late-1990s. One of the four initial aims of the UK 10-year (1998–2008) Drugs Strategy, ‘Tackling drugs to build a better Britain’ (UK Government, 1998), was ‘to stifle the availability of illegal drugs on our streets’. It was soon followed by a similar target (Target 4) at the EU level in the EU Drug Strategy 2000–2004 (European Council, 1999), ‘to reduce substantially over five years the availability of illicit drugs’, while the EU Action Plan 2000–2004 (European Council, 2000) emphasised a monitoring approach of this issue in its call for the development of ‘indicators of availability of illicit drugs (including at street level) and drug seizures’ to be supported by the EMCDDA and Europol.

Defining ‘availability’

From an operational perspective it is clear that defining availability is not simple: the word has been interpreted differently in different contexts. In a general sense, availability might be treated as synonymous with ‘access’, and in the drugs field the concept has sometimes been simply associated with ‘drug supply data’. For example, one report from the USA on cocaine availability produced various estimates based on a model derived principally from production and interdiction data (ONDCP, 2002).

Data from demand-side indicators have also been used to estimate drug availability, most simply in questionnaires that ask respondents to rate, in some way, the availability of drugs in their locality. Additionally, data on drug consumption or offers of drugs have also been used as indirect indicators. Currently, the developing consensus supports a conceptual framework for assessing drug availability that includes both supply and demand elements, though these elements have been made operational in a variety of ways and no common approach currently prevails.

Nonetheless, it does appear reasonable to consider drug availability as consisting of a synthesis of the following elements:

- the amount of illicit drugs physically on the market (drugs produced and trafficked but not seized — drug supply to the market);
- the structure of drug flows and distribution (retail outlets, dealers, drug scenes); and
- the relationships between drug users/non-drug users and this distribution structure (access).

A further valuable analytical distinction is between *global availability* and *street level availability*. In the context of the EU, *global availability* might be defined as drug availability at the upper/wholesale level of the market, or at the trafficker’s level, as a result of the interaction between drug supply and drug control strategies at that level of the market. *Street level availability* might be defined as drug availability at the retail level of the market, or at the user’s level, as a result of the interaction of global availability, distribution processes and strategies, drug control strategies at retail market level and access of various groups of users/non-users to different illicit products. Except for data relating to seizures, a common link between global and street level availability, this paper will focus on the street level of availability.

Current indicators

The current EMCDDA approach has been to develop a set of indicators of drug availability, with particular focus on street level availability. As drug availability is an ill-defined concept, a multi-indicator approach has been adopted with the objective

of bringing together these different data sources into a more general measure of availability. Information is provided annually through the Reitox network of national focal points and covers areas including: drug prices at retail level, contents of drugs and potency, drug seizures and the perceived availability of drugs at street level.

Clearly, none of these information sources produce a simple or unproblematic reflection of the availability of drugs in Europe and any analysis must be made with caution. The corroboration of contextual and qualitative information is particularly important if erroneous inferences are to be avoided. Drug seizures, for example, are influenced by the level and efficiency of law enforcement activity (which vary both between and within countries over time) as well as the availability of drugs in a particular market. Despite this problem, seizure data do appear to be useful in looking at trafficking routes (UNODC, 2005) and in many cases it seems fair to make the assumption that drug seizures in a given country are at least somewhat correlated to the amount of drugs imported or smuggled into that country. It has even been assumed in international discourse that drug seizures represent a relatively stable proportion of the drug supply (often assumed to be about 10%) and could therefore be considered as an indicator of drug availability on the national market. In the case of cannabis, seizures of plants have also been taken as an indicator of the extent of domestic cannabis cultivation or cultivation in neighbouring countries (Pietschmann, this monograph).

Similarly, both price and the potency of illicit drugs may have an impact on the perceived availability of illicit drugs and reflect important supply-side factors that affect access. This relationship is often not a simple one, but both price and potency can be considered as indirect indicators of drug availability. Drug prices may vary according to many factors including the level of the market or volume at which they are traded. Prices are also likely to reflect the basic laws of supply and demand. In this respect, lower prices would in theory seem to indicate a higher availability (or a greater supply), or, although it is perhaps less likely, reduced demand.

For a number of methodological and practical reasons, interpreting data on potency is a complicated task — and these difficulties are particularly apparent for cannabis (see below). However, this information is collected in some EU countries principally as a legal requirement for criminal prosecutions, but also, in some cases, as part of drug monitoring activities. Although establishing a direct link between potency and availability is difficult, changes in the overall potency of drugs, especially when prices are moving in an opposing direction, can be regarded as a useful indirect indicator of availability — albeit one to be interpreted carefully.

Finally, school and adult surveys sometimes include questions on the perceived availability of drugs in the communities from which the respondents are drawn. Although important methodological questions exist, such as the influence on such perceptions of

different kinds of exposure to drug use and the overall reliability of perceptions reported in drug surveys, this kind of data can also provide indirect yet complementary data on drug availability.

What do the available data tell us about cannabis availability in Europe?

Due to methodological issues and a simple absence of complete and detailed time-series data, limitations are imposed on any attempt to answer this question. Despite this setback, it is possible to some extent to construct a general picture of the different indicators of cannabis availability in Europe. Taking the year 2003 as an example, below we describe the information available and explore to what extent a coherent picture of trends in cannabis availability can be established.

Seizures

The EMCDDA dataset on drug seizures dates back to 1985, and the data records both seizures and quantities of drugs seized. Data availability has varied as countries have improved their reporting capacity, but considerable work remains to be done on improving the comparability of measures used. These data relate to all seizures made over the course of a year by all law enforcement agencies (police, customs, national guard, etc.). Although generally rare, double-counting may occur within the data presented by some countries.

The implications of looking at quantities seized or numbers of seizures can be different. A major proportion of the number of overall seizures usually comprises small seizures made at the retail or street level of the market. Quantities seized may fluctuate from one year to another due to a few exceptionally large seizures of drugs made further up the distribution chain. For this reason the number of seizures is sometimes considered a better indicator of trends — although a count of the number of seizures is sometimes less available. A further complication for cannabis arises because of the different types of cannabis available in Europe. Only since 1995 has it been possible to begin to make a distinction between different types of cannabis products — that is, plants, herb and resin — and some countries are not able to do this. Therefore, the corresponding time series are sometimes incomplete, making the analysis of EU trends more difficult ^(?).

^(?) Caution is required on the reporting of herbal and plant seizures, as practices might vary by country, possibly leading to the incorrect categorisation of one type of substance into either herbal or plant seizures.

Seizures of cannabis plants

Cannabis grown within the EU is beginning to represent a significant part of the market. Data on seizures of cannabis plants from EU reporting countries and Norway in 2003 amounted to 8 600 ⁽³⁾ seizures of about 1.6 million plants and 8.9 tonnes of the same material. The highest numbers of seizures were reported by the United Kingdom, followed by Hungary and Finland ⁽⁴⁾, while the largest quantities were recovered in the Netherlands, followed by Italy, Poland and the United Kingdom.

Not all countries can provide data for the period 1998–2003 but based upon the information available a decline was evident in the number of seizures of plants reported until 2001, followed by a subsequent increase. Since 1998, overall quantities seized have been increasing with peaks in 2000 and 2001, mainly due to exceptionally large seizures made by Italy in these years (1.3 and 3.2 million plants, respectively).

Seizures of cannabis resin

About 200 000 seizures ⁽⁵⁾ and 1 025 tonnes of cannabis resin seized were reported in the EU and Norway in 2003, with Spain accounting for the biggest share by far, both in terms of numbers and quantities seized, and reflecting the importance of the Iberian peninsula as an importation route for Moroccan-produced cannabis entering Europe (see Gamella et al., this monograph). France and the United Kingdom, which represent relatively large markets for cannabis, also stand out as countries seizing significant quantities of the drug. Both in terms of numbers and quantities, overall cannabis resin seizures increased during the period 1998–2003. However, in 2003, the number of seizures declined while quantities increased highly due to large amounts recovered in Spain.

Seizures of herbal cannabis

In the EU herbal cannabis is less commonly seized than resin — illustrated by the fact that in 2003 the total amount of herbal cannabis seized was 79 tonnes, or less than 10% of the amount of resin seized, with the United Kingdom recovering the largest quantities every year, followed by Italy. Numbers of seizures of herbal cannabis have been increasing overall since 1998, though they remained stable in 2003, as opposed to figures for quantities seized, which have been declining for most years.

⁽³⁾ Reported by 17 countries (data not available for Denmark, France, Italy, Cyprus, Latvia, the Netherlands, Poland, Slovenia and Sweden).

⁽⁴⁾ However, data on the number of seizures made were not available for countries seizing the largest quantities — Italy and the Netherlands.

⁽⁵⁾ Reported by 19 countries (data not available for Denmark, France, Italy, Cyprus, Latvia, the Netherlands and Slovenia).

In analysing seizure data a useful distinction can be made between police and customs seizures, based on the assumption that police seizures may better reflect retail level activity and that customs seizures are at a wholesale level and may include drugs in transit to third countries. Since 1995, data collection at the European level have included a request for a breakdown by seizing entity. This dataset requires further development as not all countries are currently able to provide this information nor is it possible at present for some countries to make a distinction between different cannabis products. Therefore, due to missing data, totals will represent an underestimate of the true situation.

Despite these limitations, data show that from 1998 to 2003 there was a general increase in the number of police seizures of cannabis (all material included) whilst the number of reported customs seizures remained relatively stable. Quantities of cannabis seized by both police and customs authorities increased during this period at about the same rate. For both seizing entities Spain was responsible for a major share of the quantity of drugs recovered. A gross calculation of the average sizes of cannabis seizures ⁽⁶⁾ over the period 1998–2003 shows that police seizures are usually smaller than customs ones, with size ratios up to 1:100 in Spain and the United Kingdom.

Retail prices

Data on retail prices of cannabis products come from a range of different sources, the comparability of which is often unclear. These sources include test purchases, interviews with arrested dealers/consumers, police intelligence and surveys of drug users. Sampling strategies used for calculating price estimates also vary considerably and in some countries the representativeness of these data is questionable. The EMCDDA is working with national experts to improve the comparability of data and methodological approaches of collecting price data at the street or retail levels. Although caution is required when drawing any firm conclusions from the currently available dataset, it is possible to obtain a general picture of overall trends.

Because prices vary by product type, efforts have been made to distinguish between different types of cannabis. The main breakdown by product type is made between herbal cannabis and cannabis resin. Whenever possible, a further distinction is made between different types of herbal cannabis, as the herbal cannabis market often contains a number of distinct products. In particular, high potency types of cannabis, such as some forms of domestically produced product, attract a premium price. However, it has only recently become possible to make this sort of distinction, and further analysis is hampered by a lack of data on the dynamics of the European cannabis market.

⁽⁶⁾ Dividing quantities seized by numbers of seizures.

Prices in 2003

Data for 2003 on the price of resin and herbal cannabis are available from 24 and 21 European countries respectively. The ranges reported for minimum and maximum prices of cannabis resin and herb are relatively narrow compared with potency data (see below). Although considerable variation is seen between the cheapest and most expensive countries, considerable overlap also exists between many countries with respect to average prices reported. The average price of resin varied from EUR 1.4/g in Spain to EUR 21.5 in Norway, with about half of all countries reporting average prices in the range of EUR 5–11. Most countries reported a lower price for herbal cannabis than resin, again with a considerable range of EUR 1.1/g in Spain to EUR 12 in Latvia, and most countries reporting average prices between EUR 5 and 8 per g. The importance of looking at sub-types of herbal cannabis was illustrated by the Netherlands and the United Kingdom, where analysts were able to provide a separate estimate for home-produced cannabis, the price of which was higher — on average EUR 6/g in the Netherlands and EUR 8.2/g in the United Kingdom.

Because cannabis prices may be higher in countries where other goods are more expensive or there is a higher standard of living, in order to attempt to explain differences in cannabis prices between countries, it is possible to look at correlations between a country's average prices of cannabis products and the country's demographic and socio-economic situation in the same year, as represented by two indices — the human development index (HDI) ⁽⁷⁾ and gross domestic product per capita in purchasing power parity (GDP per capita in PPS) ⁽⁸⁾. Analyses show that there is no clear correlation between such indicators and cannabis prices (by product) when considering all the reporting countries together. However, further distinction between groups of countries suggests that prices of both resin and herbal cannabis are positively correlated to both the HDI and GDP (per capita in PPS) in the countries from the EU-15 ⁽⁹⁾. In the new EU Member States, there is either a negative or non-existent correlation between prices of both cannabis products and the HDI and GDP (per capita in PPS). However, it should be noted that the negative correlations found in this group of countries were stronger for herbal cannabis than for resin ⁽¹⁰⁾.

⁽⁷⁾ The Human Development Index is a composite index measuring the average achievements in a country in three basic dimensions of human development: a long and healthy life (measured by life expectancy at birth); knowledge (measured by the adult literacy rate and the combined gross enrolment ratio for primary, secondary and tertiary schools); and a decent standard of living (measured by GDP per capita in purchasing power parity (PPP) US dollars) (UNDP, 2005).

⁽⁸⁾ Taking as a basis EU-25 = 100 (source: <http://epp.eurostat.ec.europa.eu>).

⁽⁹⁾ The correlation coefficients in the EU-15 in 2003 were: 0.66 between resin price and HDI; 0.46 between resin price and GDP (per capita in PPS (purchasing power standard)); 0.54 between herbal cannabis prices (type unspecified or imported) and HDI; and 0.59 between herbal cannabis prices (type unspecified or imported) and GDP (per capita in PPS).

⁽¹⁰⁾ The correlation coefficients in the new Member States in 2003 were: -0.16 between resin price and HDI; -0.05 between resin price and GDP (per capita in PPS); -0.50 between herbal cannabis prices (type unspecified or imported) and HDI; and -0.34 between herbal cannabis prices (type unspecified or imported) and GDP (per capita in PPS).

Though this analysis is tentative, it does suggest some relationship between cannabis prices and national demographic and socio-economic situations in the older EU Member States, where cannabis markets are relatively long established. The picture is less clear for the new Member States, where there are not only questions of data quality but also the possibility that markets in these countries are subject to strong change. Other indicators have suggested that cannabis use is increasing, though often from low initial levels, and that these cannabis markets should be considered relatively ‘young’ and far less established. Routes of cannabis trafficking might also explain some of the differences observed between EU countries in the retail level price of cannabis products — particularly by noting the proximity of Morocco for producing cannabis resin and the increasing importance of Albania for producing herbal cannabis. Countries that are closer to these producing regions are likely to experience lower transport costs during trafficking and, therefore, lower prices.

Long-term price trends

An analysis of long-term trends in prices is hampered by the fact that although a few countries have been reporting data on cannabis products since the mid-1990s or earlier, it takes several years for the dataset to grow sufficiently large enough to explore trends at a European level. It should also be noted that data from the new EU Member States have only been available since 2002. The EU mean (arithmetic mean) of average prices of cannabis resin (corrected for inflation ⁽¹¹⁾) in reporting countries slowly decreased in the period 1996–2003 (see Figure 1). A more detailed analysis of such prices in countries that have been reporting for four years or more shows that overall trends for 1999–2003 ⁽¹²⁾ were either stable or declining in all countries, with the exception of France and Luxembourg, where a modest increase was noted.

Changes in the average prices of herbal cannabis are less clear than those of cannabis resin. Indeed, Figure 2 does not show a clear overall EU trend of such prices in reporting countries, except for a fall in 2003 in a majority of countries. Over 1996–2003, however, the EU mean ⁽¹³⁾ of reported prices increased overall, with a peak in 2001 and a fall since then ⁽¹⁴⁾. In most of the countries reporting for at least four years, herbal cannabis prices have remained stable or have decreased ⁽¹⁵⁾, while an upward trend was reported by the Czech Republic, Latvia, Luxembourg and Portugal. The average price of locally produced herbal cannabis has been declining in recent years in both of the countries that are able to report on the price of these products separately (Netherlands, United Kingdom).

⁽¹¹⁾ Taking 1996 as a base year for the value of money in all countries.

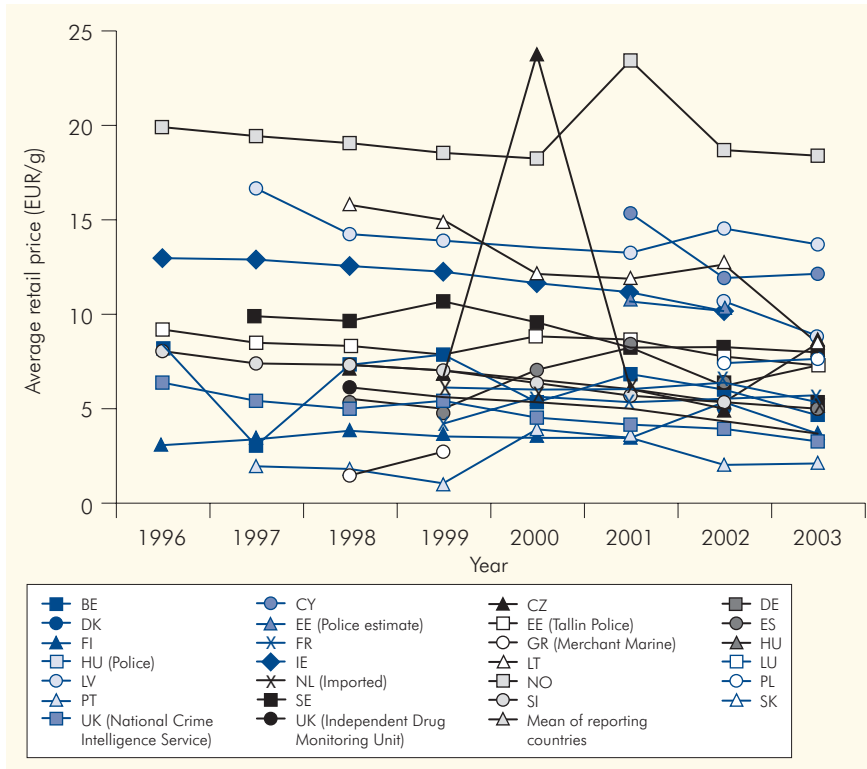
⁽¹²⁾ Taking 1999 as a base year for the value of money in all countries.

⁽¹³⁾ Arithmetic mean.

⁽¹⁴⁾ Taking 1996 as a base year for the value of money in all countries.

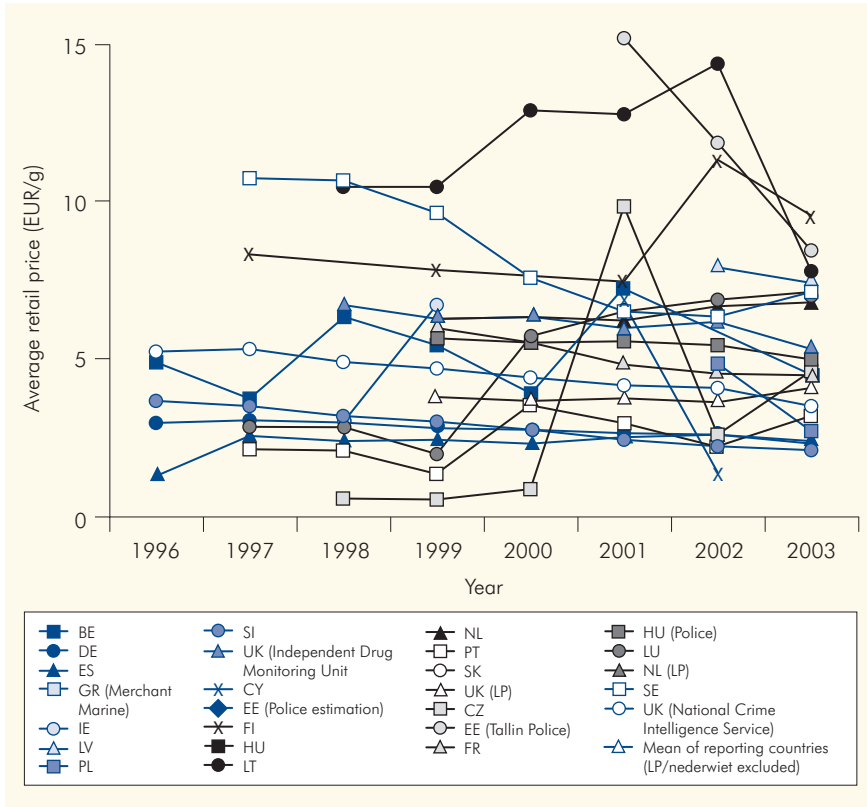
⁽¹⁵⁾ Taking 1999 as a base year for the value of money in all countries.

Figure 1: Average retail price of cannabis resin (EUR/g) — adjusted to inflation — in the EU Member States and Norway, 1996–2003



Notes: Prices are adjusted for inflation, taking 1996 (for all countries) as a base year. Belgium (1996, 1997, 1999, 2000, 2003); Czech Republic (1998–2003); Germany (2002); Latvia (2001–2003); Norway (2002–2003); Poland (2002–2003); Slovakia (2002–2003); Slovenia (1996–2003): figures reported as averages are actually middle points between minimum and maximum prices. The Netherlands: 1999 data refer to 1999/2000; 2000 data refer to 2000/2001; 2001 data refer to 2001/2002; 2002 data refer to 2002/2003; 2003 data refer to 2003/2004. Spain: the price reported as average refers to quantities sold by gram. Hungary: the figure reported as average is actually the modal, or 'typical' price. Source: Reitox national focal points.

Figure 2: Average retail price of herbal cannabis (EUR/g) — adjusted to inflation — in the EU Member States and Norway, 1996–2003



Notes: LP refers to 'nederwiet', usually locally produced cannabis herb. Prices were adjusted to inflation, taking 1996 (for all countries) as a base year. Hungary: the figure reported as average is actually the modal, or 'typical' price. The Netherlands: 1999 data refer to 1999/2000; 2000 data refer to 2000/2001; 2001 data refer to 2001/2002; 2002 data refer to 2002/2003; 2003 data refer to 2003/2004. United Kingdom: figures submitted as 'nederwiet' refer to 'skunk'. Belgium (1996, 1997, 1999, 2000, 2003); Czech Republic (1998–2003); Germany (2002); Latvia (2001–2003); Poland (2002–2003); Slovakia (2003); Slovenia (1996–2003): figures reported as averages are actually middle points between minimum and maximum prices. Source: Reitox national focal points.

Time trends of the average price of both resin and herbal cannabis have also been reported by 15 EU Member States ⁽¹⁶⁾. Comparisons between prices of both products ⁽¹⁷⁾ show that over the period 1996–2003, the average price of resin was overall higher than that of herbal cannabis in all but two of the reporting countries, although this difference was not often strongly pronounced. Additionally, trends in the average price of both products by country are similar in all the reporting countries, except France, which reported an overall fall in herbal cannabis prices and an increase in average resin prices. Lastly, reported data show a possible convergence between average prices of cannabis resin and herb in many countries.

Potency

The potency of cannabis products is a topic considered in detail elsewhere in this monograph and so will only be briefly considered here. Potency of cannabis is usually defined as the *tetrahydrocannabinol* (THC) content by percentage. Both practical and methodological difficulties mean that data on cannabis potency must be viewed with some caution. For example, the number of samples analysed varies greatly between countries (from four to over 3 000 samples in the 2003 data submitted to the EMCDDA) and, thus, the representation of samples in a given user population may be questionable. Furthermore, there are analytical difficulties in the precise and accurate determination of the potency of cannabis products (EMCDDA, 2004) and considerable variations in both the practice of taking samples from cannabis cultivation sites for analysis and that of sampling parts of the material to be analysed (ENFSI, 2005). All of these reasons mean that there is a need to improve and standardise approaches in this area if the reliable monitoring of cannabis potency is to be achieved. As stated above, it is important to distinguish between different types of cannabis (resin and herbal cannabis) — especially when considering potency. Theoretically, a further distinction should be made whenever possible between imported herbal cannabis and home-produced herbal cannabis, although in practice very few countries can systematically report data separately. For all types of cannabis the assessment of trends over time are hampered by a lack of historical data, with only a couple of countries reporting before 1999.

⁽¹⁶⁾ Belgium, Czech Republic, Germany, Ireland, Spain, France, Cyprus, Latvia, Lithuania, Luxembourg, Netherlands, Portugal, Slovenia, Sweden, United Kingdom.

⁽¹⁷⁾ In each country, we have taken the first year of the series of data available (from 1996 onwards) as a basis for the value of money.

Cannabis resin potency

Compared with prices, cannabis potency is reported by fewer countries but still shows considerable variation. Average potencies of cannabis resin in 2003 varied between less than 1% and nearly 25%, with a majority of countries reporting average potencies between 7% and 15%. The range of values upon which average potencies are calculated was very wide in some countries — raising questions about how meaningful the reported average values are for describing the cannabis market. An extreme example is in Slovakia, where there is a difference of 53 percentage points between the lowest and the highest potencies found. Out of the 16 countries reporting data on resin potency in 2003, eight report minimum values under 1% while seven report maximum values over 25% (three of which report maximum values of 40% or over). Given that much of the cannabis resin consumed in Europe is produced in North Africa under similar conditions, these differences are difficult to explain (see Gamella, this monograph). Data available show an overall (moderate) increase in the average potency of cannabis resin since 1999, although there has been a decline in 2002 in a majority of reporting countries.

Herbal cannabis potency

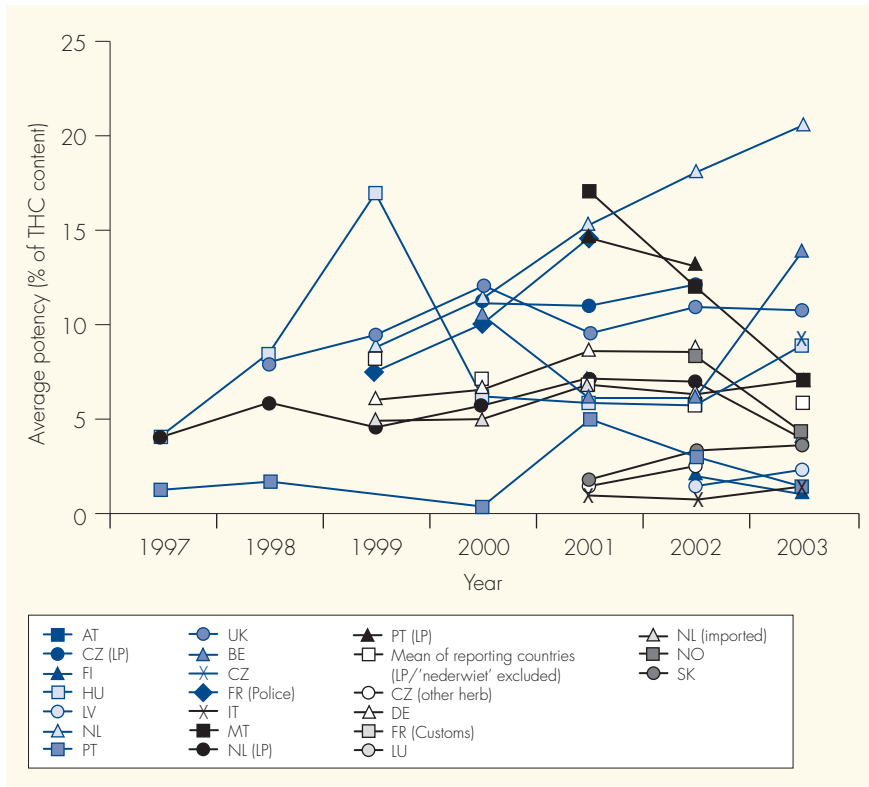
The average reported potency of herbal cannabis in 2003 was generally lower than that of resin in all countries, with the exception of the United Kingdom. Reported values ranged from less than 1% to nearly 14%, with half of the countries ⁽¹⁸⁾ reporting estimates of between 4% and 9%. Locally produced herbal cannabis is now available in most EU countries, and when produced under intensive conditions it can be of high potency. Only the Netherlands was able to provide a separate estimate in 2003 for this type of product (20.3% THC on average). It is hard to observe any overall clear trend for the EU in the potency of herbal cannabis in general over the last five years (see Figure 3). At a national level some countries reported a modest increase. Elsewhere, a relatively stable situation can be observed. Overall, the mean value ⁽¹⁹⁾ of the reported averages of herbal cannabis shows little variation over the period 1999–2003 ⁽²⁰⁾. The reported potencies of locally produced herbal cannabis where these data are available show an increase in the Netherlands, and a relatively stable situation in the Czech Republic. In both countries the estimated potency of home-produced herbal cannabis exceeded that of cannabis resin from 2002.

⁽¹⁸⁾ Seven out of a total of 14 countries reporting data on the average potency of herbal cannabis in 2003.

⁽¹⁹⁾ Arithmetic mean.

⁽²⁰⁾ It is actually slightly decreasing over 1999–2003, but variations in the mean can be explained by the fact that the number of countries reporting data has varied over the period, thus affecting the number of countries upon which the mean is calculated; indeed five countries reported data on the average potency of herbal cannabis of type unspecified or imported for 1999 and 14 for 2003. Indeed, the calculated means of the data from the nine countries reporting over 2001–2003 and of those from the seven countries reporting over 2000–2003 are both slightly increasing.

Figure 3: Average potency of herbal cannabis, measured as percentage of THC content, in the EU Member States and Norway, 1996–2003



Notes: LP refers to 'nederwiet', usually locally produced cannabis herb. Czech Republic: figures reported as average are actually middle points between minimum and maximum potencies. Figures reported as 'nederwiet' refer to more potent cannabis herb, such as sinsemilla or 'skunk' (locally produced as well as imported). Figures reported as 'other herb' refer to cannabis herb of type other than 'nederwiet'. Germany: figures reported as average are actually the median. The Netherlands: 1999 data refer to 1999/2000; 2000 data refer to 2000/2001; 2001 data refer to 2001/2002; 2002 data refer to 2002/2003; 2003 data refer to 2003/2004. Portugal: data are based on users' reports until 2001 and since 2002 on users/traffickers and traffickers' reports. Portugal LP: although these are resin samples, given the high THC% found, it is suspected that they might be locally produced herbal cannabis. Source: Reitox national focal points.

Similar trends in resin and herbal cannabis potency?

Data available from 12 countries allow a time trend comparison of the average potency of both resin and herbal cannabis. Although resin potency was estimated as higher in 2003, this was not necessarily the case in previous years: only two countries reported resin as having a consistently higher potency than herbal cannabis. Overall trends are difficult to define. Data available show similar trends in resin and herbal cannabis potencies in France (customs data) ⁽²¹⁾, the Netherlands and Slovakia. In France both resin and herbal potencies showed a moderate increase from 1997–2002 and then a decrease in 2003. In the Netherlands and Slovakia, average potencies of all cannabis products have been increasing (1999–2003 in the Netherlands, 2001–2003 in Slovakia), although the increase for resin (and locally produced herb in the Netherlands) was much steeper. In the United Kingdom too, overall trends in the potency of resin and herb in the period 1998–2003 are similar, although the potency of resin increased steadily while the potency of herbal cannabis fluctuated greatly within the general upward trend. Austria (2001–2003) and Italy (1999–2003) ⁽²²⁾ reported the opposite trend in resin and herbal cannabis potencies. In Austria, resin potency decreased from 2001 to 2002 then increased in 2003, while the potency of herbal cannabis increased and then decreased. In Italy, cannabis resin potency increased until 2002 then decreased, while the potency of herbal cannabis decreased then increased. Although these reports must be checked against data for future years, trends reported in 2003 suggest a convergence between potencies of cannabis resin and herbal cannabis in some countries — Belgium, Italy, Latvia and the United Kingdom ⁽²³⁾.

Perceived availability

In addition to market information, the availability of drugs has been a part of questions posed in surveys of both general and school populations. Surveys allow researchers to get information on the perception of availability and behaviours of the population in terms of reported use or non-use of illicit substances. Availability questions have been used in a number of surveys in Europe, though with no standardisation of approach. Thus, differences in formats, variables and answering modalities make comparisons and analysis difficult at the EU level. The EMCDDA is currently working with Member States to develop a new module on drug availability in the existing European Model Questionnaire (EMCDDA, 2002) for population surveys. Recently, guidelines have

⁽²¹⁾ This is also the case in France for the data from the police, but this source reports only data for 2002 and 2003, which limits the analysis of time trends.

⁽²²⁾ As well as in Latvia and Norway, but these countries report only data for 2002 and 2003, which limits the analysis of time trends.

⁽²³⁾ In Germany, too, a convergence was reported, but only in 2001 and 2002 since 2003 data were not available.

been developed to include questions on exposure (offers or propositions of drugs and opportunities to use drugs), perceived availability (subjective assessment of drug availability based on current individual circumstances) and access to drugs (how, where and from whom to get drugs in individuals' current situations).

Currently, the only cross-European source able to provide standardised data on perceived availability is the ESPAD (2005) school survey series (European School Survey Project on Alcohol and Other Drugs) (see Hibell, this monograph). This is a repeated survey carried out among 15–16-year-old students in 26 to 35 European countries in 1995, 1999 and 2003. The survey allows a comparison to be made on the perceived availability of cannabis across the EU Member States and Norway for the age group sampled. Results for 2003 show that getting 'hashish or marijuana' was reported to be 'fairly easy' or 'very easy' by 40–60% of the students in the Czech Republic, Denmark, Ireland, France, Italy, Slovenia, Slovakia and the United Kingdom; by 25–40% in Poland, Portugal and Norway; and by 10–25% in Estonia, Greece, Cyprus, Latvia, Lithuania, Hungary, Malta and Sweden. The percentage of those finding it fairly or very easy to get cannabis has been increasing overall since 1995 in the Czech Republic, Estonia, Italy, Lithuania, Hungary, Poland, Slovenia and Slovakia, and at a more moderate rate in Cyprus, Denmark, France ⁽²⁴⁾, Latvia, Malta, Portugal, Finland, the United Kingdom and Norway, while the reported ease of getting cannabis decreases in Ireland, Greece ⁽²⁵⁾ and Sweden.

These differences broadly reflect patterns found in consumption data in the EU Member States and Norway between aggregated data on perceived availability of cannabis and lifetime prevalence of cannabis use in this population — demonstrated by a strong linear correlation for the years 1995 ($r = 0.91$), 1999 ($r = 0.81$) and 2003 ($r = 0.90$). There is also a relatively strong correlation between changes in perceived availability of cannabis and changes in lifetime prevalence of cannabis use, between 1995 and 1999 ($r = 0.83$) and between 1999 and 2003 ($r = 0.62$).

Discussion

Clearly, many methodological challenges exist regarding the interpretation of data on seizures in general ⁽²⁶⁾, the analysis of data on price and potency, and understanding data on perceived availability in general and school populations. One of them, not

⁽²⁴⁾ Based on 1999–2003 only.

⁽²⁵⁾ Based on 1999–2003 only.

⁽²⁶⁾ It is now widely acknowledged that, across countries, drug seizures do not represent the same proportion of the amount of drugs being smuggled into or circulating in a given country, especially as this may vary according to trafficking routes and location of production areas. We have assumed for this analysis that there is a somewhat positive relationship between cannabis seizures and its availability on the national market.

Table 1: Comparative analysis of national cannabis trends (seizures, prices, potency, perceived availability) during the period 1998–2003

Country	Seizures						
	Nb plant	Qty plant	Nb resin	Qty resin	Nb herbal	Qty herbal	Nb police
Belgium		(+)	+	+	(+)	(+)	
Czech Republic	(+)	(=)	(=)	(+)	(+)	+	
Denmark						(+)	
Germany	-	-	-	+	=(- rec)	-	
Estonia		+	+	+	=	-	
Ireland	=	-	-	+	+	+	
Greece	(=)		(+/=)	+	(-/=)	-	(-)
Spain	(+)	+	(+/=)	+	(+)	+	+
France	(-)	(-/=)k (=/+)p	(+)	+	(+)	+	-
Italy		=		=		-	
Cyprus		+		(-)		=	
Latvia							
Lithuania		(+)		(+)	+	-	(+)
Luxembourg		-	+/=	+	+	+	+
Hungary	(+)		(+)		(+)	+	
Malta	(=)	(+)		+		(+)	
Netherlands		+		=		-	
Austria	+	+	-	+	+	-(+ rec)	
Poland		+	+	+	+	+	+
Portugal	+	(+)	=	+	+	+	=
Slovenia	(=)	(+)	(=)	=	(+/=)	+	
Slovakia	+	+	=	=	+	-	(+)
Finland	+	+	+	=/+	+	+	-
Sweden	(=)	(=)	+	=/+	+	+	+
United Kingdom	=	-(+ rec)	-	-(+ rec)	+	+	-
Norway	+	+	=	+	+/=	+	

Notes

Nb, number of seizures; Qty, quantity seized; PAV, perceived availability ('fairly easy' and 'very easy' to get cannabis).

Prices adjusted to inflation (taking as a basis the initial year of the series for each country).

+, increasing; -, decreasing; =, stable; +/-, slightly increasing; -/=-, slightly decreasing; =/+ , rather stable, although very slightly increasing; =/-, rather stable, although very slightly decreasing.

rec, recent change in the trend; LP, locally produced herbal cannabis; IMP, imported herbal cannabis; H, herbal cannabis of type unspecified; k, quantities in kg; p, quantities in number of plants.

Qty police	Nb customs	Qty customs	Price		Potency		Perceived availability	
			Resin	herbal	Resin	herbal	95-03	99-03
+			-	=/-	+	+ H		
	+	+	-	+	- (+ rec)	(+ H) = LP	=/+	+
							+	-
			=/+	=/+	-	+		
	+	(+)	(=)				+	+
+	-	-	-	=/-			-/=	=/+
-	=	=/+						-
+	+	+	=	=				
		+	+	-	+C (+P)	= H/Cu (+/= H/Po)		+
+/=		-			+	(-)H	+	=/+
-			(-)	(-)			+/=	+
			=	+	(-)	(+)H		+
(+)	(=)	(+)	-	=			+	+
+	-	+	+	+	+			
						(+)H		
						(-)H	+	+
			=	= H = LP	+	+ IMP + LP		
					(-)			
+	+	+	(=)				+	+
+	+	+	+/=	+/=	+	=/+ H (-LP)	+	+
(-)	(=)		-	-			+	+
(-)	(-/=)		(=)		+	(+)H	+	+
+	(-/=)	=(/+)	(-)			(-)H	+	=/-
+	+	-	-	-			-/=	-
+	-	-(+ rec)	-	-	=	+ H	+/=	+
			=			(-)H		

For potencies in France: Cu, customs data; Po, police data.

Between brackets (...): to be taken with great caution as series might be too incomplete (only two years available or two last years missing), numbers might be too small or there might be a dramatic change in the last year.

Blank: no (trend) data available, or high fluctuations showing no clear trend.

yet mentioned, is that available data may indicate changes in different parts of the population. Indeed, changes in the perceived availability in one group of young people (which uses only a small proportion of all the cannabis consumed) may indicate something else than, for example, changes in seizures or potency. Yet, if analytical difficulties are put aside for a moment, a simple comparative analysis of the national trends in each of the indicators over 1998–2003 ⁽²⁷⁾ can be constructed. This can be seen in Table 1 (pp. 232–233), which summarises the trends per indicator and per cannabis product that available data show.

Existing data point towards increasing availability of cannabis products in four countries. In Belgium, there seems to be a clear trend towards the increasing availability of both resin and herbal cannabis, based on an upward trend in seizure and potency data and a downward trend in cannabis prices. In the United Kingdom too, the availability of both products seems to be on the increase, although this is comparatively less clear-cut as seizure and perceived availability data experienced shifts in trends. Data from France point towards an increasing availability of herbal cannabis, while it is less clear that this is also true for resin. In the Netherlands, the availability of locally produced herbal cannabis seems to be on the increase, while that of resin and (imported) herbal cannabis might be said to have remained comparatively stable, or have slightly increased, during this period.

In other countries the picture is less clear, or there is simply insufficient information available to judge. In Italy, Lithuania and Slovakia data point to a possible increase in the availability of resin, while in Spain, Portugal and Slovenia data seem to indicate an increase in the availability of both resin and herbal cannabis. In Ireland it is not clear whether data point to an increasing availability of both herb and resin (especially at retail level as quantities seized by customs are decreasing) or to a stable trend. And in Poland there is a possible increase in availability of cannabis in general (data do not allow for more specificity). It should be noted, however, that data may point to decreasing availability in Greece at the retail level, in particular for herbal cannabis, and in Germany, with respect to resin.

Conclusion

It is not our intention here to suggest that this simple analysis can be anything but exploratory. However, it is helpful in illustrating the difficulties in producing an operational research and analysis framework for the concept of availability, especially for a drug like cannabis. The first of these difficulties is the simple observation that

⁽²⁷⁾ However, trends in perceived availability in school surveys have been included for both 1995–2003 and 1999–2003, as considering only the latter trend means calculating a trend between only two measures, which is quite limited.

availability is a very difficult concept to separate out from that of prevalence. Trying to decide this from available indicators risks asking chicken-or-egg type questions. For example, perceived availability can be seen as closely associated with levels of use, as can some seizure data. That said, there may still be a use for a general concept of availability that is not simply reducible to an indirect reflection of prevalence. Clearly, both conceptual and modelling work is required here if a more robust and useful conceptual framework for thinking about drug availability is to emerge.

A second general observation regards the need to improve both the availability and quality of data sources. In all the data sources discussed above, some progress has been made in moving towards common approaches, definitions and reporting standards. But in comparison to other areas of monitoring much remains to be done and at present any attempt at identifying trends is severely limited by the available time-series data. This is a particular problem for cannabis because there are particular methodological and practical problems to overcome in some of the areas of data collection, such as assessing potency or the amount of plant material seized. Additionally, at least three, and possibly more, major product types exist and trends in availability vary by each type and may be different in different countries. Trends in the availability of herbal imported cannabis, cannabis resin and cannabis grown with the EU may all be different and yet at the same time are all important in understanding the overall availability of the drug. Currently, data sources are simply not sufficiently developed to elaborate this complexity adequately. In conclusion, if cannabis has, as many believe, become a more available drug in Europe, it is difficult to show it convincingly using the available data. If the concept of availability is to remain a key target for drug policy then investment is required in improving the availability of data necessary to measure changes in this area, as is conceptual work to better understand and define the concept of availability itself.

Acknowledgements

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References

- European Council (1999), *European Union drugs strategy (2000–2004)*, CORDROGUE 64 REV 3, 12555/3/99, 1 December.
- European Council (2000), *EU-action plan on drugs 2000–2004*, CORDROGUE 32, 9283/00, 7 June.
- European Council (2004), *EU drugs strategy (2005–2012)*, CORDROGUE 77, 15074/2004, 22 November.

- European Council (2005), *EU drugs action plan (2005–2008)*, Official Journal of the European Union C 168/1, 8 July.
- European Network of Forensic Science Institutes (ENFSI) (2005) Workshop on cannabis potency, Sesimbra (oral communications).
- EMCDDA (2002), *Handbook for surveys on drug use in the general population — final report*, EMCDDA Project CT.99. EP.08 B, European Monitoring Centre for Drugs and Drug Addiction, Lisbon.
- EMCDDA (2004), 'An overview of cannabis potency in Europe', *EMCDDA Insights 6*, European Monitoring Centre for Drugs and Drug Addiction, Lisbon.
- EMCDDA (2005), *Annual report 2005: the state of the drugs problem in Europe*, European Monitoring Centre for Drugs and Drug Addiction, Lisbon.
- Hibell, B., Andersson, B., Bjarnasson, T., Ahlström, S., Balakireva, O., Kokkevi, A., Morgan, M. (2004), *The ESPAD report 2003 – alcohol and other drug use among students in 35 European countries*, The Swedish Council for Information on Alcohol and Other Drugs (CAN) and Council of Europe Pompidou Group, Stockholm.
- Office of National Drug Control Policy (ONDCP) (2002), *Estimation of cocaine availability — 1996–2000*, Office of National Drug Control Policy: Washington.
- Reitox National Reports (2002–2004)
www.emcdda.europa.eu/index.cfm?fuseaction=public.Content&nNodeID=435
- Reitox Standard Tables (2002–2004).
- UK Government (1998), *Tackling drugs to build a better Britain – the government's ten-year strategy for tackling drugs misuse/Guidance notes*, The Stationery Office.
- UNDP (2005), *Human development report 2005 — international cooperation at a crossroads; aid, trade and security in an unequal world*, United Nations Development Program, New York.
- UNODC (2005), *2005 world drug report*, United Nations Office on Drugs and Crime, Vienna.

Chapter 14

Understanding cannabis potency and monitoring cannabis products in Europe

Keywords: cannabinoids – cannabis – potency – seizures – THC

Setting the context

Perhaps spurred by rises in treatment admissions and increased knowledge about the health-related harms of cannabis, much has been claimed in the past few years about a change in the potency of cannabis.

There are patterns in recent media coverage of cannabis potency. High-potency herbal cannabis is often contrasted with a purported milder substance smoked in the 1960s and 1970s. European languages use evocative words to label high-strength, indoor-grown cannabis —‘skunk’, ‘nederwiet’, ‘summun’. There is a tendency for coverage of high-potency cannabis to share newspaper pages with extreme cases of cannabis-related psychosis, schizophrenia, treatment admissions or violent crime. Occasionally, high-potency herbal cannabis is linked to discussion of genetically modified crops, subverting identification of cannabis as a ‘natural’ drug.

There are historical precedents to such alarmism about cannabis potency. Higher strength has been attributed in the past to variants in cannabis products, notably Thai sticks in the 1970s. Authors often refer to an infamous response at a murder trial in 1938 in Newark, New Jersey: when the pharmacologist James Munch was asked about what happened when he himself had tried cannabis, he replied ‘After two puffs on a marijuana cigarette, I was turned into a bat’. Such quotes reveal the difficulties we face when trying to discuss cannabis potency from an objective perspective.

This chapter, based broadly on the findings of a longer *Insights* publication produced by the EMCDDA in 2004, is refreshingly scientific and reassuring in tone. It suggests that overall recorded cannabis potency has not increased dramatically in Europe in recent years.

This is not to say that cannabis potency is a non-issue, but rather that the data in this area are incomplete and far from conclusive. This chapter should be read with the caveat that potency data were — and remain — very limited and that some forms of cannabis now grown in Europe show relatively high potency. More research would be welcome, for example, on how exposure to high potency cannabis affects different user populations, particularly young people and vulnerable groups. In terms of long-term trends, very little is known about the strength of the cannabis smoked in the 1960s and 1970s. And what is striking is that there is considerable variation in the potency of cannabis recorded in Europe. While press coverage tends to concentrate on the strongest THC concentrations rather than average potency, what is constant is the wide range in recorded potency, with only moderate variation in average potency for all cannabis consumed.

One complicating factor is that there has been a recent shift in consumption away from imported cannabis resin to indoor-grown herbal cannabis. While few question that high potency herbal cannabis is increasingly available, particularly in northern Europe, there is a need to track the precise nature of this shift in the market from resin to herb. Are people receiving higher THC doses today than before? Are they smoking fewer joints per session? How are they consuming alcohol and tobacco in combination with high-potency cannabis? Are they smoking joints on more, or fewer days each month? How does a resin joint smoked in the early 2000s compare with a herbal joint smoked today? Can we profile typical consumers of high-potency cannabis, and are they more at risk of problems? Is the shift to herb affected by the drop in supply of Moroccan resin to Europe?

Potency is thus far more complex than the basic task of measuring seized samples of cannabis. More research in particular is needed on titration (the potency–dose relationship) and whether high-potency cannabis is necessarily linked to patterns of problematic use (see Beck and Legleye, Volume 2 of this monograph). While a recent study in the Netherlands provided some findings that high-potency cannabis sourced from Dutch coffee shops can lead to a higher THC concentration in the blood, it also suggested that a core risk group exists (young males aged 18–45, smoking cannabis regularly) which will ‘get as high as possible in one session’ (Mensinga et al., 2006). Such insights help policymakers to make joined-up decisions that go beyond issues of strength alone, addressing risky use patterns and behaviour over time.

Further reading

- Évrard, I. (2007), ‘Composition du cannabis: taux de THC et produits d’adultération’ in Cordes, J-M. et al. (2007), *Cannabis: données essentielles*, OFDT, Paris.
- King, L., Carpentier, C., Griffiths, P. (2004), *An overview of cannabis potency in Europe*, Insights No. 6, European Monitoring Centre for Drugs and Drug Addiction, Lisbon.

- Mensinga, T., de Vries, I., Kruidenier, M., Hunault, C., van den Hengel-Koot, C., Fijen, M., Leenders, M., Meulenbelt, J. (2006), *Dubbel-blind, gerandomiseerd, placebogecontroleerd, 4-weg gekruist onderzoek naar de farmacokinetiek en effecten van cannabis*, RIVM rapport 267002001/2006, Bilthoven.
- Mura, P., Brunet, B., Dujourdy, L., Paetzold, C., Bertrand, B., Sera, B., Saclier, B., Deveaux, M., Pepin, G., Perrin, M., Lecompte, Y., Dumestre-Toulet, V., Cirimele, V., Kintz, P. (2006), 'Cannabis d'hier et cannabis d'aujourd'hui. Augmentation des teneurs en THC de 1993 à 2004 en France', *Annales de Toxicologie Analytique* 18 (1): 3–6.
- Niesink, R., Rigter, S., Hoek, J. (2005), THC-concentraties in wiet, nederwiet en hasj in Nederlandse coffeeshops (2004–2005), Trimbos Institute, Utrecht.
- UNODC (2007), 'The emergence of 'new cannabis' and the reassessment of health risks', Chapter 2.3 in *World drugs report 2006*, United Nations Office on Drugs and Crime, Vienna.

Understanding cannabis potency and monitoring cannabis products in Europe

Leslie King

Abstract

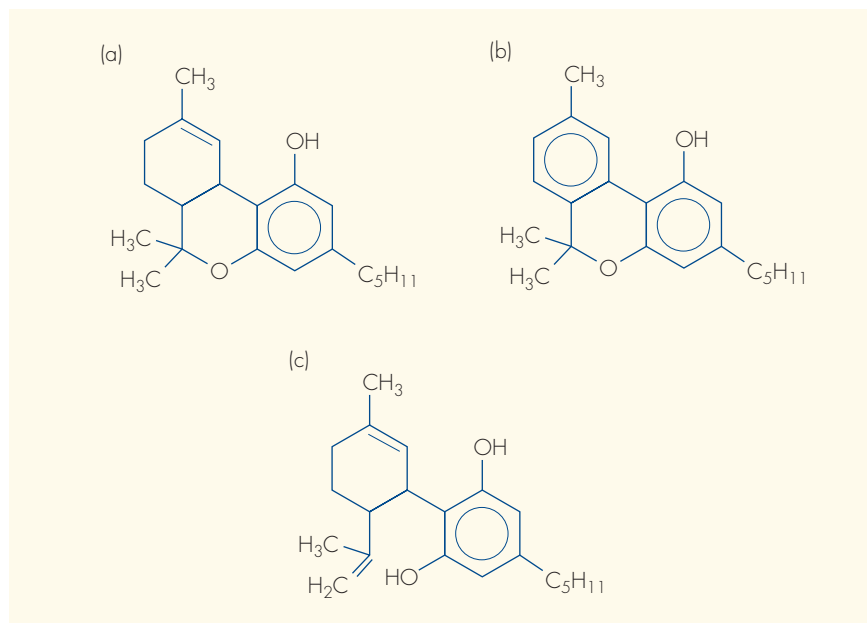
The Δ^9 -tetrahydrocannabinol (THC) content (potency) of herbal cannabis and cannabis resin imported into Europe has remained stable for many years at around 2–8%. Yet cannabis produced locally by intensive, indoor cultivation (sinsemilla) typically has twice as much THC. In some Western European countries, where cannabis resin is the most commonly consumed product and herbal cannabis continues to be imported, the weighted average potency is largely unaffected by these modern developments. However, elsewhere not only is herbal cannabis the dominant product, but that market is largely supplied by sinsemilla. Few countries in Europe have THC measurements stretching back more than five years, and the data are somewhat compromised by analytical difficulties, sampling strategies and the varying nature of cannabis and cannabis resin. Also lacking is any evidence to show that users of high-potency cannabis have higher blood THC levels. The widely publicised claims that cannabis is now 10 or more times more potent than it was 10 or 20 years ago are not supported by the evidence from Europe.

Introduction

The potency of cannabis is defined as the concentration (%) of Δ^9 -tetrahydrocannabinol (THC), the major active principal of the cannabis plant. As a broad guide, cannabis and cannabis resin typically contain 2–8% THC. However, as will be discussed later, certain products may contain appreciably more. Cannabis grown for fibre production (hemp) will normally contain less than 0.3% THC. Although references will sometimes be found in the literature to ‘cannabis purity’, this term is ambiguous and could refer to whether or not the material has been adulterated. For example, in the publication *Global Illicit Drug Trends* (UNODC, 2003), ‘purity levels’ of herbal cannabis and cannabis resin are either clustered around 1 to 10%, where they probably reflect the THC content, or they are much higher, typically above 50%, suggesting some other measure of purity.

The chemical structure of THC is shown in Figure 1(a). It is one of a large number of related substances known as cannabinoids. Other major constituents of cannabis and cannabis resin are cannabinalol (CBN; Figure 1(b)) and cannabidiol (CBD; Figure 1(c)).

Figure 1: The structures of three major cannabinoids (THC, CBN and CBD)



Notes: (a) Δ^9 -tetrahydrocannabinol (THC); (b) cannabinalol (CBN); (c) cannabidiol (CBD).

It has been suggested that CBD can act as an antagonist of THC (Smith, 2005). This would be of some concern if, as THC levels increased, the CBD concentration stayed constant. However, as far as can be determined from the limited published analytical data, there is a positive correlation between the THC and CBD levels (King et al., 2005a). Cannabis resin has higher relative levels of CBD than herbal cannabis, but the pharmacological significance of this is unclear.

A large fraction of the THC may be in the form of Δ^9 -tetrahydrocannabinolic acid (THCA). When cannabis is smoked, THCA is converted to THC, although other substances are also formed (Hazekamp, personal communication, 2004). The active isomer Δ^8 -THC is found in much smaller amounts. The highest levels of THC occur in the resinous material produced by glandular trichomes, mostly situated around the flowers of the female plant. Fertilisation and consequent seed production cause a reduction in the level of THC. Much lower amounts are present in the leaves and in male plants, while the stalk and clean seeds contain almost no THC.

Atmospheric exposure of THC causes oxidation to cannabinalol (CBN; Figure 1(b)) and other substances. In cannabis resin, Martone and Della Casa (1990) showed that, even when stored in the dark, the half life of THC was often less than one year, and in some cases THC had disappeared almost completely within two years. In a block of resin, this could lead to variations in the THC concentration between the outside and the inside. The rate of THC decomposition in cannabis at room temperature was estimated as

17% per annum by Ross and ElSohly (1997–1998). Since CBN is almost entirely absent from fresh cannabis, these authors suggest that the ratio CBN/THC could serve as a measure of the age of a sample. The relevance of this to questions of potency can be understood when it is realised that some imported products may have been harvested or manufactured many months before consumption or analysis. By contrast, local production will lead to a fresher product containing more THC.

During the past few years, some concern has been expressed that the potency of cannabis could be much greater than it was. It has been suggested that the THC concentration may have increased so much that the illicit drug now bears little resemblance to the cannabis that was used only 30 years ago. A widely publicised example of this is the statement by the so-called ‘drug czar’ in the USA (Walters, 2002), published in the *Washington Post*, that ‘parents are often unaware that today’s marijuana is different from that of a generation ago, with potency levels 10 to 20 times stronger than the marijuana with which they were familiar’. In a similar vein, Henry (2004) commented on the apparent increase in association between cannabis and deaths recorded as accidents and suicides. He is quoted as saying, ‘until the early 1990s, there was less than one per cent tetrahydrocannabinol in most cannabis. Now the most potent form, skunk, contains up to 30 per cent’. Most cannabis is smoked, and according to Ashton (House of Lords, 1998), ‘a typical “joint” today may contain 60–150 milligrams or more of THC’.

Meanwhile, in some European countries the numbers of those entering specialised drug treatment centres, who are reported as having cannabis-related problems, have been rising (EMCDDA, 2004) and it has been suggested that high-potency cannabis may be a factor in this trend. High dose cannabis may also be a consideration in evaluating the impact of cannabis on the development of mental health problems such as psychosis, depression and schizophrenia (see, for example, Arseneault et al., 2004).

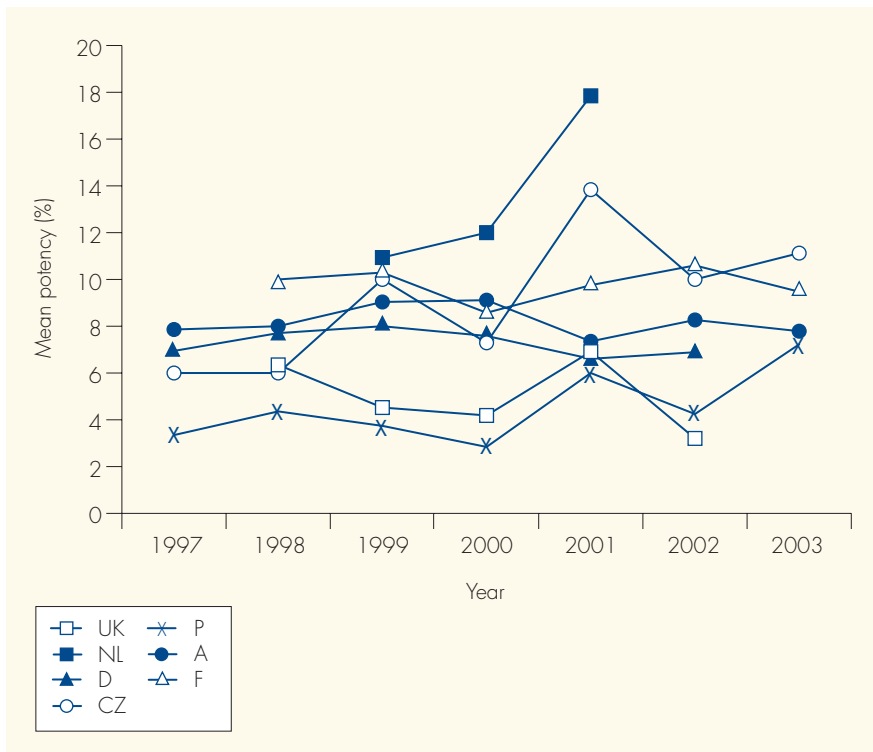
However, the potency question is not new. Nearly 20 years ago, Cohen (1986) noted that ‘material ten or more times potent than the product smoked ten years ago is being used, and the intoxicated state is more intense and lasts longer’. But Mikuriya and Aldrich (1988) pointed out that the cultivation of sinsemilla and its superiority to other forms of cannabis was well known to the British government in India in the 19th century. So what is the evidence that the potency of cannabis has increased in recent decades?

Changes in cannabis potency in Europe

The THC content of cannabis products is routinely determined in many European and other countries. Analyses are usually carried out in forensic science laboratories on behalf of law enforcement agencies, in some cases to provide evidence of cultivation/

production. Some information on cannabis potency since 1998 can be found in the EMCDDA's *national reports* (Standard Table 14). However, these data are rather limited, and no clear trends can be detected. In a recent study (King et al., 2004), much more data were collected, although information on potency trends over five years or more was only available from five countries and a number of methodological problems and information gaps existed. The participants in that survey were asked, by means of a questionnaire, to provide annual mean values of THC percentage in cannabis products, together with information on sample sizes, sampling strategies, method of analysis, the relative consumption of different cannabis products and other information. Despite the limitations, a fairly clear pattern emerged from the survey. Firstly, the potencies of resin and herbal cannabis that have been imported into Europe have shown little or no change, at least over the past 10 years or so. This is hardly surprising since these products have been made by traditional methods that have probably remained the same for generations (see Gamella and Jiménez, this monograph). A brief summary of those findings and a discussion of the implications has been provided by King et al. (2005b). Figure 2 shows the potency of cannabis resin over the period 1997–2003 in the original

Figure 2: Mean potencies of cannabis resin in seven European countries



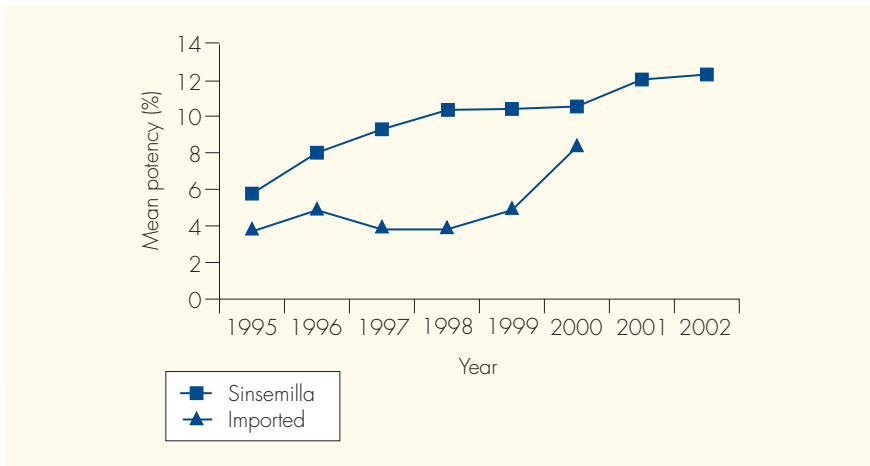
Notes: UK, United Kingdom; NL, Netherlands; D, Germany; CZ, Czech Republic; P, Portugal; A, Austria; F, France.

six countries reported by King et al. (2004) together with data subsequently received from France (OFDT, 2005).

The rapid rise in potency in the Netherlands after 1999 can be explained by the local production of cannabis resin. This material, known as *nederhasj*, is not only uncommon in the Netherlands, but is almost unknown elsewhere. When the data from the Netherlands are excluded from Figure 2, no overall trend is apparent in the overall mean potency. In the United Kingdom, THC measurements date back 30 years, and the annual mean potencies of cannabis resin as shown in Figure 2 are, if anything, slightly lower than those in the period 1975–1989 (Baker et al., 1980, 1981, 1982; Pitts et al., 1990; Gough, 1991). Cannabis (hash) oil is uncommon in Europe, but its THC content has also shown no clear trend over many years (Baker et al., 1982; Gough, 1991; King, 2001).

What has changed throughout Europe and elsewhere is the appearance, from the early 1990s, of herbal cannabis grown from selected seeds by intensive indoor methods. This material, best described as domestically produced ‘sinsemilla’ (from the Spanish, ‘without seeds’), is also known as ‘skunk’, ‘buds’, ‘tops’ or ‘nederwiet’. Its hydroponic cultivation, with artificial control of ‘daylight’ length, propagation of female cuttings and prevention of fertilisation, certainly does produce cannabis with a greater potency; on average, it may be twice as high as imported herbal cannabis. Further information on the production of sinsemilla can be found in the reviews by Szendrei (1997–1998) and Bone and Waldron (1997–1998).

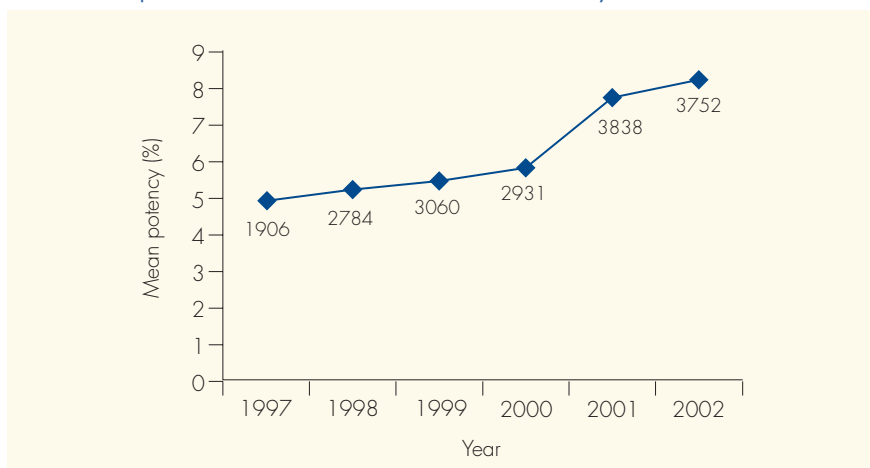
Figure 3: Mean potencies of two types of herbal cannabis examined in the United Kingdom



Note: The total sample sizes were: sinsemilla = 938; imported herbal = 117. Source: Forensic Science Service.

The THC content of herbal cannabis in the United Kingdom is shown in Figure 3. However, it must be recognised that it is not always possible for a forensic scientist to distinguish the two forms of herbal cannabis. To a large extent, the definition of material as sinsemilla must rely on other circumstances, such as the characteristics of the plantation or 'grow room'. This information may not always be provided by law enforcement agencies and hence some confounding of the two forms may occur. This is illustrated in Figure 3 where the rise in the potency of imported herbal cannabis after 1998 could be an artefact. A similar, albeit modest, rise in the potency of herbal cannabis was also found in Germany (see Figure 4) although no distinction was made between traditional (i.e. imported) herbal cannabis and material produced by hydroponic methods. A small rise in the potency of herbal cannabis was reported by the Czech Republic, but no information was available on the sampling strategy or sample sizes. Further evidence that sinsemilla has a higher potency than imported cannabis can be seen in data produced by the Netherlands (Figure 5). Potency data for herbal cannabis in France are shown in Figure 6, and represent the overall annual mean values for both police and customs seizures (OFDT, 2005). No distinction was made between traditional imported herbal cannabis and sinsemilla, but in each year the mean potency of material examined by the police was close to the mean potency of customs cases. Furthermore, for both herbal cannabis and resin in France, there was little difference in the THC content, according to whether the samples had been seized by law enforcement agencies or the samples had been collected from users (Bello et al., 2005). As with the other countries for which trend data were supplied (Austria and Portugal), little evidence was found for an increase in the potency of imported herbal cannabis.

Figure 4: Mean potencies of all herbal cannabis in Germany



Note: Figures against each point represent the number of measurements.

Figure 5: Mean potencies of two types of herbal cannabis in the Netherlands

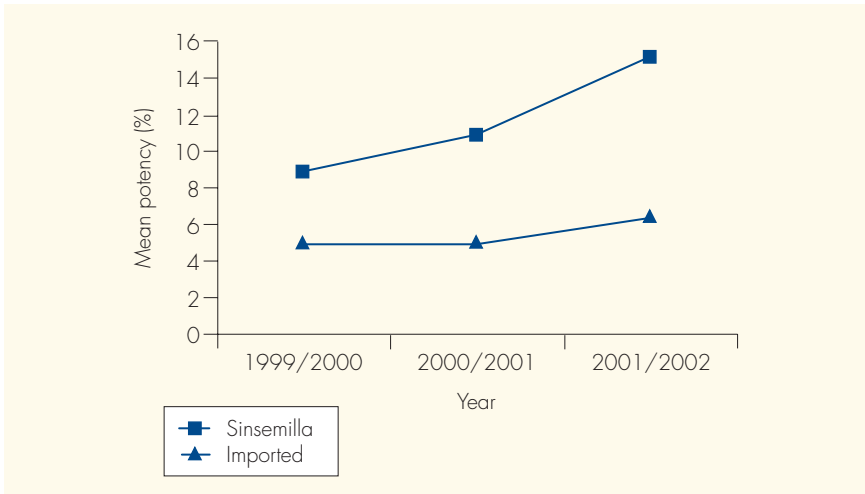
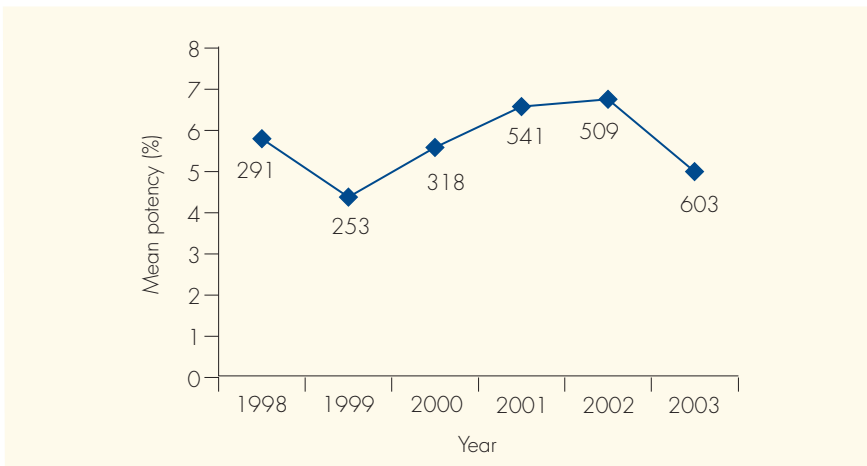


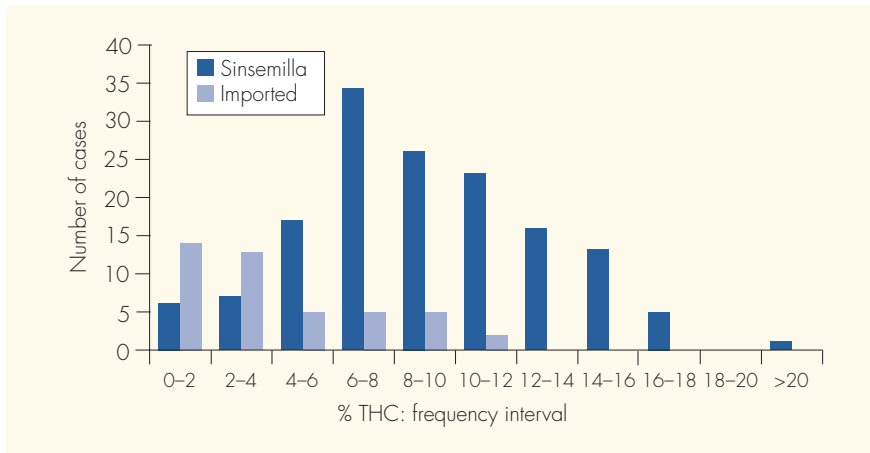
Figure 6: Mean potencies of all herbal cannabis in France



Note: Figures against each point represent the number of measurements

The most recent data from the Netherlands (Pijlman et al., 2005) show that the THC content of cannabis products has increased even further than illustrated in Figure 5. However, these data need to be interpreted with caution since the Netherlands is anomalous for several reasons. Firstly, in all other countries in the EU the available THC data derive from the analysis of law enforcement seizures. In the Netherlands, the material examined has been purchased in coffee shops: establishments that are permitted to sell small amounts of cannabis (see Korf, this monograph). The samples purchased were generally of better quality material and may not have been necessarily

Figure 7: Frequency distributions of THC in herbal cannabis examined in the United Kingdom



Source: Forensic Science Service, 1996 to 1998.

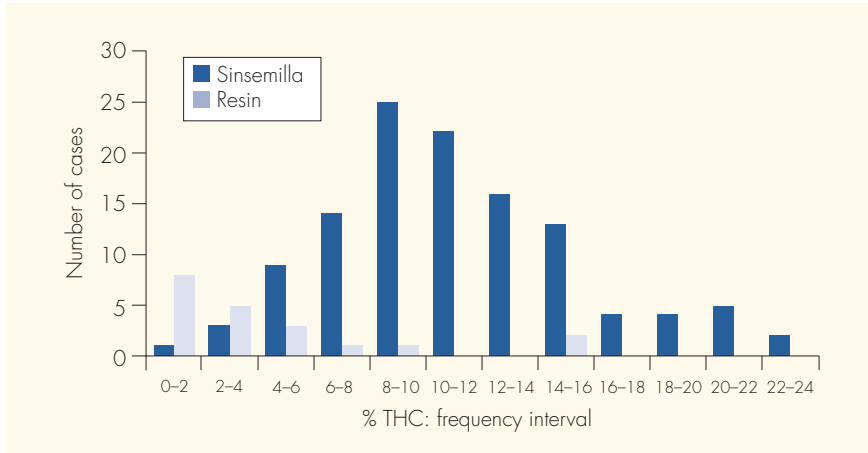
representative of all cannabis products consumed. This may explain the finding that the cannabis resin purchased for analysis also had a much higher THC content than is seen elsewhere in Europe. Secondly, as noted elsewhere in this report, the relative consumption and origins of cannabis products available in the Netherlands is quite different to other countries.

There is little doubt that, on average, sinsemilla has a higher potency than imported herbal cannabis, but it is also clear that the two potency distributions overlap, as shown in Figure 7. Some samples of imported cannabis are, and always have been, of high potency. The increased THC content of herbal cannabis produced by indoor methods is a consequence of a number of influences. These include: genetic factors (selected seed varieties and cultivation of female plants); environmental factors (cultivation technique, 'pruning' during harvesting, prevention of fertilisation and seed formation); and freshness (production sites are close to the consumer and storage degradation of THC is thereby reduced).

More recent data from the UK for 1999 to 2005 (Figure 8) show that the THC content of sinsemilla may have increased further, probably as a result of continual improvements in technique. Figure 8 also shows, for comparison, the frequency distribution of THC in cannabis resin. Whereas the shape of the distribution of THC in sinsemilla is reasonably symmetrical, the distributions of both imported herbal cannabis and cannabis resin are strongly skewed, with the most common values occurring at the lowest end of the scale.

The increases that have occurred with time in the potency of some types of cannabis must be put into the context of the relative consumption of the various products in

Figure 8: Frequency distributions of THC in cannabis resin and sinsemilla examined in the United Kingdom



Source: Forensic Alliance, 1999–2005.

Table 1: Relative consumption (%) of cannabis products in European countries since 1999

Country	Imported cannabis	Cannabis resin	Sinsemilla	Domestic resin
Belgium	80 ⁽¹⁾	20 ⁽²⁾	–	–
Czech Republic	90 ⁽¹⁾	10 ⁽²⁾	–	–
Germany	40 ⁽¹⁾	60 ⁽²⁾	–	–
Estonia	85 ⁽¹⁾	15 ⁽²⁾	–	–
Ireland	5	90	5	–
Netherlands	3	29	67	1
Austria	70 ⁽¹⁾	30 ⁽²⁾	–	–
Portugal	10 ⁽¹⁾	90 ⁽²⁾	–	–
United Kingdom	15	70	15	–

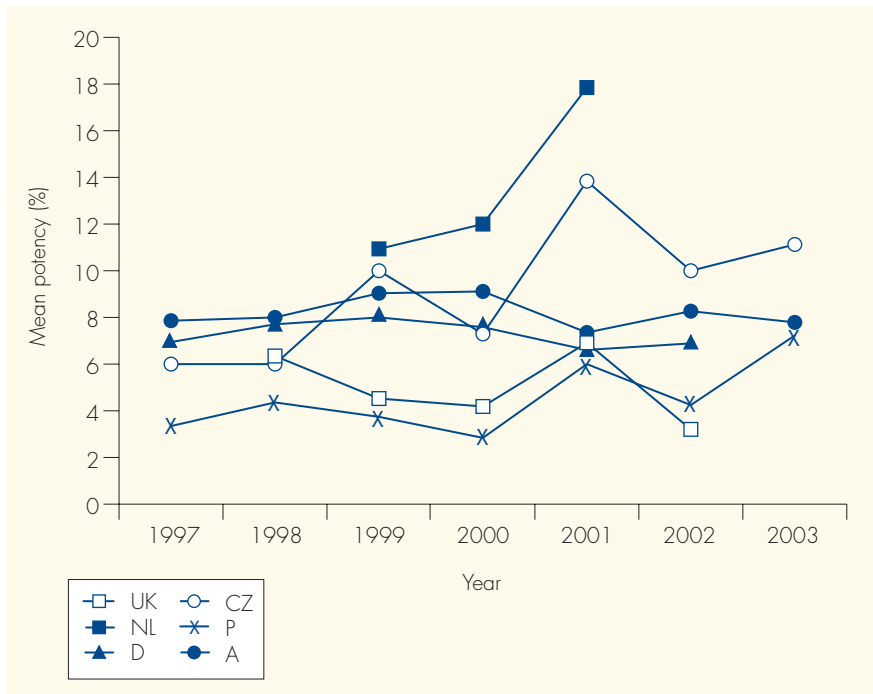
⁽¹⁾ All herbal, imported or not.

⁽²⁾ All resin, imported or not.

different countries. Table 1 sets out estimates of the relative proportion of each cannabis product on the domestic market in recent years. These estimates are shown for those countries where data were either available in the published literature, were supplied directly in response to a questionnaire in the EMCDDA study (King et al., 2004) or were derived indirectly from the relative number of samples examined in each case.

Using both potency data and a knowledge of the relative consumption of different products as shown in Table 1, it is possible to derive the weighted mean potency, that

Figure 9: Effective potency of cannabis products in several European countries



Note: UK, United Kingdom; NL, Netherlands; D, Germany; CZ, Czech Republic; P, Portugal; A, Austria.

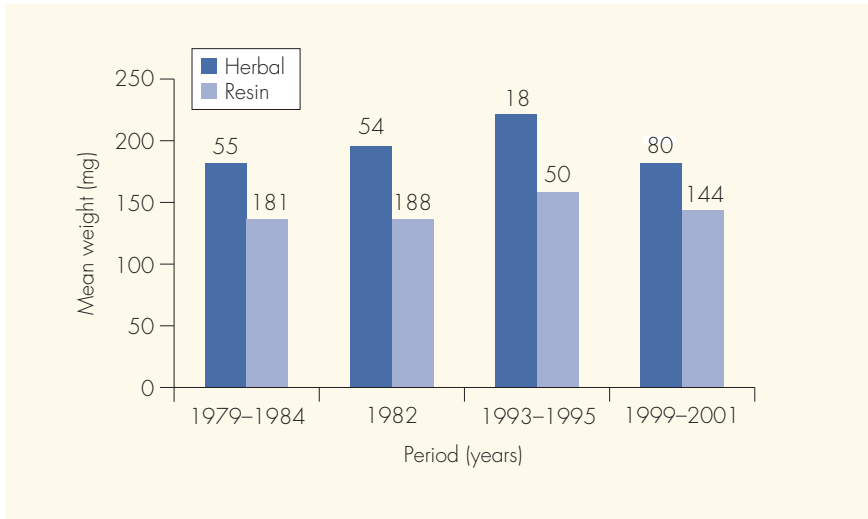
is, the effective THC concentration as would be perceived by the average user. Figure 9 shows the effective potency averaged over all cannabis products in several European countries.

Except for the Netherlands, where it is a dominant product, the limited market share experienced by sinsemilla in other countries suggests that, other aspects of behaviour being constant, users have not been exposed to significantly larger amounts of THC. Although not shown graphically here, UK data for the earlier period 1975 to 1989 indicate that the effective potency in the UK has been around 6% for the past 30 years. In Ireland, where resin is also the main product, the effective potency in 2000 was closer to 4%.

If the effective potency of cannabis had shown an appreciable rise over the past 10 to 20 years then it might be assumed that users would need to consume less cannabis on a weight basis. However, the content of reefer cigarettes (also known as joints or spliffs) examined in the UK over the past 20 years has been remarkably constant (Figure 10). Thus, the typical reefer contains 150–200 milligrams of cannabis or cannabis resin, equivalent to around 10 mg of THC (Humphreys and Joyce, 1982; Bal and Griffin,

2001). Similar results were found in Ireland (Buchanan and O’Connell, 1998). The assertion by Ashton (House of Lords, 1998) that ‘a typical “joint” today may contain 60–150mg or more of THC’, suggests a potency of over 50%.

Figure 10: Mean herbal cannabis and cannabis resin content of reefer cigarettes examined in the United Kingdom over a 20-year period



Note: The sample size in each case is shown. Source: Forensic Science Service.

Areas for improvement in analysis and interpretation

If a more accurate picture of potency trends is to be obtained then a number of areas require attention. Apart from a purely quantitative need to obtain more data, these improvements include the following.

Nomenclature of cannabis products

A particular need is the use of an agreed scheme for describing and naming imported herbal cannabis and sinsemilla. At present, a wide variety of terms are in use by authors, including ‘seeded cannabis’, ‘skunk’, ‘tops’, ‘buds’ and ‘nederwiet’. Even the term ‘imported’, usually implying a source such as the Caribbean, Africa or Asia, may not be ideal since, in some cases, sinsemilla may be imported from elsewhere in Europe. As noted earlier, confusion may still occur if the growing conditions of the plant material are uncertain, since visual examination of isolated plant material is not always

conclusive. Yet, the alternative possibilities for classification (THC content, size of seizure, type of cultivation, such as indoor or outdoor or level of sophistication) also seem unsuitable.

Relative consumption of cannabis products

In most countries, estimates of the relative consumption of different cannabis products are based largely on seizure data. Such data have limits and may not directly reflect the relative market share of different cannabis products or availability as experienced by drug users. One way forward would be to complement statistics from drug seizures with data from user surveys carried out at the retail level. This might also include information from seed suppliers and shops selling growing equipment/paraphernalia.

Proxy measures of potency

Few countries have published data on the herbal cannabis or cannabis resin content of reefer. This information would be useful as a proxy measure for potency as well as a means of tracking methods of consumption (i.e. use with or without tobacco). In Europe, information is collected routinely by the EMCDDA on drug prices at retail level. However, the quality and comparability of this information needs to be reviewed and standard methods for collection and reporting developed. Data from the Netherlands suggest a close relationship between potency and price (Trimbos Institute, 2002).

Extent of domestic production

It is important to have a better understanding of the extent of domestic cannabis production, the different types of production methods used, as well as the use of domestically produced cannabis products compared with imported products and how this varies within Europe and over time. Furthermore, home-produced cannabis may not always benefit from hydroponics or other sophisticated growing techniques.

Data presentation

When compiling data, many laboratories calculate simple mean values (often called averages: the sum of all values divided by the number of values). In a few cases, weighted means may be calculated. These take account of the fact that not all samples may be of equal size. Few authors consider whether the distribution of potency is normally distributed or if other measures of central tendency such as the median or mode would be better. Ideally, data collections should always indicate details about the sampling strategy, sample size, the mean, and where possible more detailed descriptive

statistical information (e.g. mode and median values, standard deviation and treatment of outliers).

Sampling

Sampling is probably the most important variable relating to the measured potency of cannabis. Cannabis, and to a lesser extent cannabis resin, is an extremely inhomogeneous material. As noted earlier, the THC content of different parts of the plant shows considerable variation. As well as the flowering tops of the female plant, where most of the THC is located, a sample may contain varying amounts of stalk, seeds and leaves, none of which contains much active drug. If potency is to be compared between different laboratories, or even within the same laboratory at different times, then a standard method of sample preparation is required.

Laboratory analysis

Assuming that the THC in cannabis and cannabis resin can be solvent-extracted with total, or at least a known, efficiency, then most laboratories use gas chromatography, often with flame-ionisation detection (Raharjo and Verpoorte, 2004) to determine THC concentration. This has the merit that the naturally occurring precursor (THCA) is decarboxylated to THC, just as occurs during smoking. Cannabinoids can also be determined by high-performance liquid chromatography, a method suited to profiling ('chemical fingerprinting') and the separate measurement of THCA. To measure the total THC content by HPLC, the sample must be heat treated before analysis (Lehmann and Brenneisen, 1995; Rustichelli et al., 1998; Kanter et al., 1979).

The major issue to arise in the analysis of THC concerns the accuracy (closeness to the 'true' value) of the measurement process. Poortman van der Meer and Huizer (1999) claimed that in a series of proficiency tests, using standard solutions of THC, and organised in 1997 for 30–40 European laboratories, the relative standard deviation was about 29%, whereas cocaine and amphetamine gave less than 5% and 8% respectively. This means that around one-third of results for THC were either more than 29% above or more than 29% below the mean value. It is clear that even worse precision could be expected if the measurement error caused by the sampling and extraction process were to be included.

As a reference standard, THC is usually only available from chemical suppliers in the form of an ethanolic solution and may be labelled, for example, as 'approximately 95%'. Not only could confusion arise if analysts assume the concentration to be 100%, but Poortman van der Meer and Huizer (1999), using the response of a flame-ionisation detector, found that one sample of a commercial THC solution had only 90% of the

concentration of a different commercial solution. These authors recommended that THC quantification should be based on cannabinal or cannabidiol as the internal standard and a correction made for the expected detector response from the effective carbon number of the respective substances. They claimed that this method had been used in Germany for the past 10 years. It was also the method used by Maguire (2001) to study the cannabinoid content of (mostly fibre-type) cannabis in Ireland. However, as far as could be determined in the EMCDDA study (King et al., 2004), other European laboratories continue to prepare standard dilutions of stock THC solution to construct calibration curves.

To a large extent, and excluding the special situation of locally produced Dutch nederhasj, the cannabis resin consumed in Europe in recent years has originated mostly from North Africa, with smaller amounts coming from South-West Asia. Since resin is rarely adulterated, it could be argued that, in any given year, all laboratories have been measuring broadly similar material. Despite the variation of THC content in cannabis products discussed above, if those laboratories had made sufficient measurements, then the mean potency of cannabis resin in any year should be found to be similar for all countries. Inspection of Figure 2 shows that not only is there no time trend, but there is considerable variation in the reported THC levels, both against time in any one country and between countries at any one time. It is not obvious why there should be consistently less THC in cannabis resin in Portugal compared with cannabis resin in, for example, the Czech Republic or France. This finding raises questions about the accuracy of measurement of THC in different laboratories. In other words, if all analysts had used the same THC reference standard for instrumental calibration, then these differences might not have occurred.

Pharmacology

In Europe, cannabis is normally smoked often in a mixture with tobacco in a reefer cigarette, but some is smoked in a water pipe (a bong). By contrast, in the USA where little resin is consumed, cannabis is usually smoked alone. Furthermore, the sources of cannabis and cannabis resin consumed in North America are not the same as those in Europe. Nearly all studies on the smoking of cannabis and its relation to potency have been carried out in North America, and it is clear that this research may not translate well into the European situation. Thus Matthias et al. (1997) found some evidence that those who smoke more potent cannabis are less exposed to noxious smoke components than those who use less potent forms. But in Europe, or at least in Ireland and the United Kingdom, where a reefer cigarette typically contains only 150–200 milligrams of cannabis (Buchanan and O’Connell, 1998; Bal and Griffin, 2001; Humphreys and Joyce, 1982), much of the tar, carbon monoxide and other combustion products will derive from the concomitant tobacco.

The concerns that have been expressed about a possible rise in cannabis potency often assume that users will necessarily consume more THC, but the evidence for this is equivocal. If the potency of cannabis products has shown a marked increase, then it might be expected that the typical user would need to consume less on a weight basis to achieve the desired effect. Given a choice, users preferred cigarettes with a higher THC content (Chait and Burke, 1994; Kelly et al., 1997). Ashton (1998) also argued that users would not titrate the dose of THC from cannabis in contrast to tobacco smokers. However, Heishman et al. (1989) found that those smoking cigarettes with a higher THC content tended to have a lower inhalation rate than control subjects. Yet little research has been conducted, particularly in Europe, to answer a crucial question: do those smoking high potency cannabis have higher blood levels of THC?

However, even if the strength of some forms of cannabis has increased, and even assuming that, as a consequence, users do have higher blood levels of THC, then it cannot be concluded that this will translate into a greater harm to the individual. Experience with alcohol suggests that the health consequences are not simply related to the alcohol concentration of what is consumed, but rather it is the total quantity of alcohol consumed that is important. As Hall et al. (2001) note, age of onset of use and frequency of use are likely to be more influential than changes in potency in determining consumption levels.

Medicinal cannabis

In any discussion about the health impact of high-potency cannabis, mention should also be made of cannabis used for medicinal purposes (see also Witton, this monograph). In the Netherlands, herbal cannabis is available as a prescription medicine (Office of Medicinal Cannabis, 2004). It is indicated for multiple sclerosis, certain types of pain and other neurological conditions. Patients are advised to consume the cannabis by means of a hot water infusion. However, Hazekamp (personal communication, 2004) has found that, even in boiling water, the conversion of THCA to THC can take some hours and other byproducts are formed. Remarkably, one of the forms of this medicinal product, known as 'cannabis flos', has a nominal THC content of 18% and is locally produced by the same intensive indoor methods that are used for illicit cultivation. Not only is high-potency cannabis considered suitable as a medicinal product, but an assessment carried out by the Dutch Coordination Centre for the Assessment and Monitoring of New Drugs concluded that (illicit) higher-potency cannabis products did not pose any additional risk than those present for cannabis products as a whole, either to the individual, to society, to public order or criminality (W. Best, personal communication, 2004).

Conclusion

The potency, that is, the THC concentration, of herbal cannabis produced by intensive indoor cultivation can average over 10%, compared with an average of 5% for both imported cannabis resin and cannabis grown by traditional methods. For all cannabis products there is a wide variation about average values and some users will inevitably have been exposed in almost random fashion to higher than normal THC levels in their careers. The evidence from Europe does not support the widespread claims that cannabis potency is now 10 or more times greater than it was in earlier periods. Although not part of this present review, experience from outside Europe (King et al., 2004) comes to a similar conclusion.

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References

- Arseneault, L., Cannon, M., Witton, J., Murray, R. M. (2004), 'Causal association between cannabis and psychosis: examination of the evidence', *British Journal of Psychiatry* 184: 110–117.
- Ashton, C. (1998), 'Cannabis: clinical and pharmacological aspects', internal publication of the Department of Health, UK.
- Baker, P., Bagon, K., Gough, T. (1980), 'Variation in the THC content in illicitly imported cannabis products', *Bulletin on Narcotics* 32 (4): 47–54.
- Baker, P., Taylor, B., Gough, T. (1981), 'The tetrahydrocannabinol and tetrahydrocannabinolic acid content of cannabis products', *Journal of Pharmacy and Pharmacology* 33: 369–372.
- Baker, P., Gough, T., Johncock, S., Taylor, B., Wyles, L. (1982), 'Variation in the THC content in illicitly imported cannabis products — Part II', *Bulletin on Narcotics* 34: 101–108.
- Bal, T., Griffin, M. (2001), 'Drug abuse trends', *Forensic Science Service (New Series)*, Issue 17: 9.
- Bello, P.-Y., Giraudon, I., Parent, M.-J., Cagni, G., Delile, J.-M., Frigaux, H., Merle, S., Plancke, L., Villechenoux, J.-M., Yim, J.-P. (2005), 'Composition et caractéristiques de cannabis collectés auprès d'usagers dans quatre sites en France, 2004', *BEH* 5: 91–92.
- Bone, C., Waldron, S. (1997/8), 'New trends in illicit cannabis cultivation in the United Kingdom of Great Britain and Northern Ireland', *Bulletin on Narcotics* 49 and 50 (1/2): 117–128.
- Buchanan, B., O'Connell, D. (1998), 'Survey on cannabis resin and cannabis in unsmoked handrolled cigarettes seized in the Republic of Ireland' *Science and Justice* 38 (4): 221–224.
- Chait, L., Burke, K. (1994), 'Preferences for high versus low-potency marijuana', *Pharmacology, Biochemistry and Behavior* 49: 643–647.
- Cohen, S. (1986), 'Marijuana research: selected recent findings', *Drug Abuse and Alcoholism Newsletter* 15 (1): 1–3.
- EMCDDA (2004), 'Cannabis problems in context — understanding the increase in European treatment demands', in *EMCDDA Annual report 2004*, European Monitoring Centre for Drugs and Drug Addiction, Lisbon.

- Gough, T. (1991), 'The examination of drugs in smuggling offences', in Gough, T. (ed.), *The analysis of drugs of abuse*, John Wiley and Sons, New York, 511–565.
- Hall, W., Degenhardt, L., Lynskey, M. (2001), *The health and psychological effects of cannabis use*, Monograph Series No. 44, 2nd edition, National Drug and Alcohol Research Centre, University of New South Wales, Sydney.
- Heishman, S., Stitzer, M., Yingling, J. (1989), 'Effects of tetrahydrocannabinol content on marijuana smoking behaviour, subjective reports, and performance', *Pharmacology, Biochemistry and Behavior* 34: 173–179.
- Henry, J. (2004), cited in: 'Cannabis: just a peaceful way to relax or a potent threat?', *Daily Telegraph*, London, 31 January, 13.
- House of Lords (1998), *Cannabis: the scientific and medical evidence*, Select Committee on Science and Technology, 9th Report, Session 1997–98 (HL paper 151), The Stationery Office, London.
- Humphreys, I., Joyce, J. (1982), 'A survey of the cannabis content of unsmoked reefer cigarettes', *Journal of the Forensic Science Society* 22: 291–292.
- Kanter, S., Musumeci, M., Hollister, L. (1979), 'Quantitative determination of Δ^9 -tetrahydrocannabinol and Δ^9 -tetrahydrocannabinolic acid in marijuana by high-pressure liquid chromatography', *Journal of Chromatography* 171: 504–508.
- Kelly, T., Foltin, R., Emurian, C., Fischman, M. (1997), 'Are choice and self-administration of marijuana related to Δ^9 -THC content?', *Experimental and Clinical Psychopharmacology* 5 (1): 74–82.
- King, L. (2001), 'Drug abuse trends', *Forensic Science Service*, Issue 15 (New Series), 5.
- King, L., Carpentier, C., Griffiths, P. (2004), *An overview of cannabis potency in Europe*, Insights No. 6, European Monitoring Centre for Drugs and Drug Addiction, Lisbon.
- King, L., Carpentier, C., Griffiths, P. (2005a), 'Getting the facts right: a reply to Smith (2005)', *Addiction* 100 (10): 1560–1561.
- King, L., Carpentier, C., Griffiths, P. (2005b), 'Cannabis potency in Europe', *Addiction* 100: 884–886.
- Lehmann, T., Brenneisen, R. (1995), 'High performance liquid chromatographic profiling of cannabis products', *Journal of Liquid Chromatography* 18 (4): 689–700.
- Maguire, R. (2001), 'The development, validation and application of analytical methods for the analysis of drugs of abuse', Ph.D. thesis, University of Dublin.
- Martone, G., Della Casa, E. (1990) 'Analysis of the ageing processes in hashish samples from different geographic origin', *Forensic Science International* 47: 147–155.
- Matthias, P., Tashkin, D. P., Marques-Magallanes, J. A., Wilkins, J. N., Simmons, M. S. (1997), 'Effects of varying marijuana potency on deposition of tar and Δ^9 -THC in the lung during smoking', *Pharmacology, Biochemistry, and Behavior* 58: 1145–1150.
- Mikuriya, T., Aldrich, M. (1988), 'Cannabis 1988, old drug, new dangers: the potency question', *Journal of Psychoactive Drugs* 20 (1): 47–55.
- OFDT (2005), 'Les taux de THC du cannabis en France: éléments récents d'information', Observatoire Français des Drogues et des Toxicomanies, Paris
www.ofdt.fr/BDD/publications/docs/050216_thc.pdf
- Office of Medicinal Cannabis (2004), website (accessed 2006), Ministry of Health, Welfare and Sport, Netherlands
www.cannabisoffice.nl/eng/index.html
- Pijlman, F., Rigter, S., Hoek, J., Goldschmidt, H., Niesink, R. (2005), 'Strong increase in total delta-THC in cannabis preparations sold in Dutch coffee shops', *Addiction Biology* 10: 171–180.
- Pitts, J., O'Neil, P., Leggo, K. (1990), 'Variation in the THC content of illicitly imported cannabis products — 1984–1989', *Journal of Pharmacy and Pharmacology* 42: 817–820.
- Poortman van der Meer, A. J., Huizer, H. (1999), 'A contribution to the improvement of accuracy in the quantitation of THC' *Forensic Science International* 101: 1–8.

- Raharjo, T., Verpoorte, R. (2004), 'Methods for the analysis of cannabinoids in biological materials: a review', *Phytochemical Analysis* 15 (2): 79–94.
- Ross, S., ElSohly, M. (1997–1998), 'CBN and Δ^9 -THC concentration ratio as an indicator of the age of stored marijuana samples', *Bulletin on Narcotics* 49 and 50 (1/2): 139–147.
- Rustichelli, C., Ferioli, V., Baraldi, M., Zanolì, P., Gamberini, G. (1998), 'Analysis of cannabinoids in fiber hemp plant varieties (*Cannabis sativa* L.) by high-performance liquid chromatography', *Chromatographia* 47 (3/4): 215–222.
- Smith, N. (2005), 'High potency cannabis: the forgotten variable', *Addiction* 100 (7): 884–886.
- Szendrei, K. (1997–1998), 'Cannabis as an illicit crop: recent developments in cultivation and product quality', *Bulletin on Narcotics* 49 and 50 (1/2): 1–21.
- Trimbos Institute (2002), *Nationale Drugmonitor*, Trimbos Institute, Utrecht.
- UNODC (2003), *Global illicit drug trends for 2003*, United Nations Office on Drugs and Crime, Vienna.
- Walters, J. (2002), 'The myth of "harmless" marijuana', *Washington Post*, 1 May 2002.

Chapter 15

Multinational export–import ventures: Moroccan hashish into Europe through Spain

Keywords: cannabis – cannabis resin – crime networks – criminology – Morocco – socio-economic analysis – trafficking

Setting the context

In recent decades, Morocco has emerged as the world's largest producer and exporter of cannabis resin, or hashish. The Moroccan cannabis resin market is substantial: the country supplies over 70% of the cannabis resin consumed in Europe, and half of global production (EMCDDA, 2006). Within Morocco itself, hashish is one of the key agricultural products of the provinces containing the *Rif* mountain range in northern Morocco, and an estimated 760 000 peasant farmers (2.5% of the population) obtain their livelihoods from hashish. By 2003, Morocco's cannabis resin production had reached 3 070 tonnes, with a retail market value estimated at over EUR 12 billion by the UNODC. Since then, cultivation has decreased substantially, due both to crop eradication efforts, political pressure placed on the Moroccan government and the damage wrought by a major drought in 2005. The most recent UN figures put production at around 1 070 tonnes, resulting in a retail market estimate of EUR 4.6 billion.

The full picture of hashish trafficking is more complex. It is estimated that only about a tenth of the retail earnings are likely to end up in the pockets of Moroccan farmers, wholesalers and traffickers. The majority of profits are made lower down the supply chain once the resin has entered the EU. Most Moroccan hashish is exported through the Iberian peninsula, particularly Spain, a country that is today the crucial transit zone for Moroccan hashish sold in the European market. From Spain, cannabis resin is bounced through a complex network that unites producers, traffickers, dealers and consumers.

This chapter examines the export–import system of cannabis resin between Morocco and the EU through Spain. It combines a review of the literature on the Moroccan production

of hashish and a preliminary analysis of over 2 000 press reports using an event history analysis approach (Franzosi, 1995; Olzak, 1992). The result is data on 1 370 groups of importers and dealers apprehended during a 27-year period, and a first sketch of the structure of the multinational smuggling industry. The result is a typology of networks and groups who deal with hashish at different levels of a distribution pyramid, profiled according to the size of 'project' they manage. The chapter thus clarifies the importance of networks and hierarchies in illegal enterprises, the type of complex and impermanent structure that has received considerable attention in EU criminology literature (see Dorn et al., 2005).

A number of enforcement questions arise from this chapter. Given the strong decrease in Moroccan cannabis resin production, is supply moving elsewhere? A number of countries in northern Europe are reporting increasing use and domestic cultivation of cannabis herb (see Carpentier, this monograph), with an indirect effect on the potency of cannabis consumed (see King, this monograph). Recent press reports also suggest that Sub-Saharan Africa is stepping into a gap in the market: seizures of resin are increasing along the Saharan route via the North African coast, and countries such as Algeria, Libya, Niger and Mali have reported overall increases in seizures. However, given the fluctuation that characterises such seizure statistics, it is difficult to draw clear conclusions. Another question is whether Moroccan cannabis resin trafficking networks are diversifying into cocaine trafficking. This is a concern expressed by the Spanish and French authorities, together with Europol with some concern about cocaine seizures on the Cádiz coast, a traditional hashish route. Reported seizures of cocaine in Morocco have fluctuated greatly since 2000, peaking at 15.8 tonnes in 2002, yet with a wide range starting at 0.9 tonnes in 2000 to just over 4 tonnes in 2004 (UNODC, 2006).

Further reading

- Dorn, N., Levi, M., King, L. (2005), *Literature review on upper level drug trafficking*, UK Home Office Online Report 22/05, London.
- Europol (2005), *European Union situation report on drug production and drug trafficking 2003–2004*, Europol, The Hague.
- UNODC (2007), 'Invisible empire or invisible hand? Organized crime and transnational drug trafficking', Chapter 2 in *World Drugs Report 2007*, United Nations Office on Drugs and Crime Control, Vienna.
- UNODC and Kingdom of Morocco (2007), *Enquête sur le cannabis 2005*, United Nations Office on Drugs and Crime, Vienna.

Multinational export–import ventures: Moroccan hashish into Europe through Spain (1)

Juan Francisco Gamella and Maria Luisa Jiménez Rodrigo

Introduction

The production of cannabis is a global phenomenon; 134 countries have been identified as source countries of this substance (UNODC, 2007). Two regions, however, concentrate the largest markets for cannabis products, and the largest accumulation of revenues: North America, where two-thirds of all cannabis products are sold, mainly in the form of marijuana, and Europe, the largest importer and consumer of resin or hashish (for more detail on the world cannabis market, see Legget and Pietschmann, this monograph).

Figure 1: The Moroccan Rif



(1) We want to thank Alicia Rodríguez Marcos for her help in collecting news clips, and Alexandra Bruehl, Aryelle Goins and Isabel Velez for their suggestions and corrections to previous versions of this paper.

While the production of herbal cannabis is widely dispersed around the planet, including a growing number of European home-growers, the production of resin is centred in a few countries such as Morocco, Pakistan, Afghanistan, Lebanon and Nepal. Among them, Morocco has become the world's largest producer and exporter, supplying over 70% of resin consumed in Europe (EMCDDA, 2007). Although statistics vary widely, in recent years Morocco's hashish production has declined from 3 070 tonnes in 2003 to 1 070 tonnes in 2005 (UNODC, 2007). Average retail prices for cannabis resin is reported in Europe at between EUR 2.30 and EUR 11.40 per gram, while cannabis resin seizures for 2003 in Spain and Portugal were reported at 809 tonnes, or just over a quarter of Moroccan production (EMCDDA, 2006). The UNODC's estimate of the annual international market for Moroccan cannabis resin has seen a decline from EUR 10.8 billion in 2004 to EUR 4.6 billion in 2005.

Most Morocco-produced hashish is exported through Spain, a country that is today the crucial transit zone for Moroccan hashish sold on the European market (Figure 1). In 2003, out of the 757 tonnes of Moroccan resin seized in the EU, 727 tonnes (over 90%) were seized in Spanish territory or jurisdictional waters (UNODC, 2005). This binational industry has exploded in the last three decades from a traditional base of rural growers in the Ketama region, whose products were distributed from the late 1960s by hippie entrepreneurs. In the last decade, smuggling networks have begun to move faster and further, and to establish international connections with traffickers of other drugs, for instance with large cocaine exporters from South America, who are increasingly using the routes opened by the distribution of Moroccan hashish.

The 14 km of the Strait of Gibraltar, and the frontier around the Spanish enclaves of Ceuta and Melilla, make up one of the deepest socio-economic and cultural divides on the planet ⁽²⁾. Disparities in wealth, income, demographic structure, educational and labour opportunities are huge and stimulate a licit and illicit movement of persons that in many ways parallels the movements of drugs, money and manufactured products. This is a crucial frontier for the EU and its policies concerning development, immigration and drug control.

This chapter examines the export–import system of cannabis resin between Morocco and the EU through Spain. First, we will review what is known about the extent, location and organisation of cultivation and manufacture in northern Morocco. We will then explore the structure of the import industry using Spanish data. We will consider the type of organisations and networks that participate in this trade, their structure, and the tasks their members perform in their transactions. We will also examine the profile of

⁽²⁾ In 2004 the GNI per capita of Spain was 14 times that of Morocco; the GNI per capita of France was 20 times that of Morocco. By comparison, the US GNI per capita was six times that of Mexico, its southern neighbour (World Bank).

workers and entrepreneurs in these groups, and the changes that seem to have occurred in recent decades. We will also present some observations about the permanence of the smuggling networks and organisations, their strategies to avoid detection, and the pricing tendencies in this market. This information may help to clarify the importance of networks and hierarchies in illegal enterprises (Morselli, 2001; Natarajan and Belanger, 1998; Ruggiero and South, 1995; Reuter and Haaga, 1989; Adler, 1985; Reuter, 1984), and the nature of the cannabis industry.

Data sources

We use a combination of primary and secondary data sources, including prior studies and reports published by international agencies, data from our ethnographic fieldwork in drug trading environments and our ongoing research and analysis of seizure cases published in the Spanish press from 1976 to 2003. In this period, thousands of illegal deals were prevented. The press reports on these failed transactions provide important insights on the structure of hashish distribution and the character of drug trafficking organisations. We have applied to this topic the methodology of event analysis as it has been developed by historians in their study of collective actions along a wide time span (see Franzosi, 1995; Olzak, 1992; Tilly et al., 1975).

Production and manufacture in Morocco

In the past 20 years, cannabis cultivation has spread in all directions from the traditional areas in the central Rif, where it has been present since the 15th century (OGD, 1996). However, recent crop eradication efforts, together with the effects of a drought in 2005 have led to a strong decline in cultivation from 2004 until 2006. From the early 1980s to the 2000s, the area devoted to cannabis seemed to have multiplied by 20, and doubled every three to five years. There is considerable agreement in the literature about this rising trend in the various estimations available, notwithstanding their disparities (see Labrousse and Romero, 2001). This constant growth occurred despite the well-publicised campaigns by the Moroccan government in the 1990s to eradicate drug trafficking (Ketterer, 2001).

Recently the UNODC has undertaken detailed surveys of cannabis cultivation with the cooperation of the Moroccan government (UNODC, 2004, 2005, 2006). These surveys provide the most accurate data on the extent, characteristics and value of cannabis production in the country today. Table 1 summarises their results.

Most *kif*, as cannabis is locally known, is grown in four northern provinces along the Rif mountain chain. One province alone, Chefchaouen, accounts for 56% of cultivation, followed by Taounate (17%), Al Hoceima (16%) and Tetouan (11%). A further province,

Table 1: UNODC Morocco cannabis surveys, 2003, 2004, 2005 — main results

	2003	2004	2005
Total cannabis cultivation	134 000 ha	120 500 ha	72 500 ha
Number of households cultivating cannabis	n/a	96 600	89 800 (excludes Larache province)
Cannabis yield			
On rain-fed land	750 kg/ha	750 kg/ha	459 kg/ha
On irrigated land	1 270 kg/ha	1 270 kg/ha	1 821 kg/ha
Gross production of raw cannabis	109 000 tonnes	98 000 tonnes	53 300 tonnes
Potential production of cannabis resin	3070 tonnes	2 760 tonnes	1 066 tonnes
Raw cannabis needed to produce 1 kg resin	35.4 kg	35.4 kg	
Distribution of farmers' sales			
Raw cannabis	66%	66%	
Cannabis resin	34%	34%	
Cannabis sale prices at farm gate			
Raw cannabis	Dh 35/kg	Dh 25/kg	Dh 50/kg
Cannabis resin	Dh 1 400/kg	Dh 1 400/kg	Dh 4 000/kg
Total farmers' income from cannabis	Dh 4.0 billion (EUR 362 million, USD 417 million)	Dh 2.9 billion (EUR 263 million, USD 325 million)	Dh 3.5 billion (EUR 312 million, USD 386 million)
Average income per household growing cannabis	n/a	Dh 30 000 (EUR 2 700, USD 3 300)	Dh 38 900 (EUR 3 600, USD 4 300)
GDP per capita Morocco	USD 1 484	USD 1 677	USD 1 725
Cannabis resin seized in Morocco	96 tonnes	87 tonnes	97 tonnes
Cannabis resin of Moroccan origin	946 tonnes	n/a	
Amount seized in Europe	757 tonnes	n/a	
Annual turnover of international trade in cannabis resin of Moroccan origin	EUR 12.4 billion, USD 15 billion	EUR 10.8 billion, USD 13 billion	EUR 4.6 billion, USD 10.8 billion

Sources: UNODC, Enquête sur le cannabis (2005), UNODC World Drugs Report 2005; IMF GDP per capita, current prices.

Larache, reported no significant cannabis cultivation following a crop eradication programme in the summer of 2005. In Chefchaouen a quarter of arable land was planted with cannabis in 2005, while in other provinces this share was between 3% and 10%. Cannabis was grown in three out of four *duars* (villages), mostly in smallholdings. Nearly 90 000 families grew *kif*, obtaining about half their income from cannabis (Dh 38 900 or EUR 3 600). About 760 000 peasants live from this illicit crop (UNODC, 2005) and other estimations are even larger ⁽³⁾. *Kif* has become a pillar of the economy.

A hectare planted with *kif* produces 2–8 tonnes of raw plant (2.3 tonnes on average) depending on soil conditions, irrigation, use of fertilisers, etc. The estimated resin production for 2005 was 1 066 tonnes. Productivity varies from year to year, often drastically. This is typical of dry farming conditions in the Mediterranean basin, due to great oscillations in rainfall. Part of the crop is locally consumed, mostly in the form of low-grade marijuana, which has been traditionally smoked in the region since the 16th century (OGD, 1996). Nevertheless, most of the production is exported to European markets in the form of resin or hashish. Programmes for substituting cannabis with alternative crops have failed so far, although significant progress was made from 2004 until the time of publication in 2008. *Kif* is 12 to 46 times more profitable than traditional cereal crops, such as wheat and barley (Labrousse and Romero, 2001). In fact, some of the best plots, previously devoted to food crops, are now used to grow cannabis, and forest land has been cleared to plant *kif*.

Manufacturing: from *kif* to hashish

Farmers sell both raw cannabis plants, and powder (*sandouk*). According to UNODC, 35.4 kg of raw cannabis are needed to make 1 kg of hashish. Extracting resin powder from plant material increases profits by about 13% ⁽⁴⁾ (UNODC, 2005). Pascual Moreno offered different estimations. According to his fieldwork, extracting the resin dust from *kif* would increase profits by up to 66% ⁽⁵⁾. However, the risks of being denounced to the police also increase (Labrousse and Romero, 2001). Thus, it seems that two out of three farmers sell raw plants to manufacturers and middlemen.

⁽³⁾ Pascual Moreno, an agronomist, director of an EU substitution program in the Rif, has worked for 25 years in the region. He estimated that over 200 000 smallholders cultivated cannabis in the Rif in the early 2000s, covering a total area of around 250 000 hectares and affecting from 1 to 1.5 million people (cited in Labrousse and Romero, 2001).

⁽⁴⁾ The difference in price is from Dh 3 500 for 100 kg of raw cannabis to about Dh 3 950 for the 2.82 kg of resin obtained from them.

⁽⁵⁾ According to Pascual Moreno, 100 kg of *kif* will get the farmer 5 200 Dh. The 3.5 kg of hashish that can be obtained from the 100 kg, Dh 8 750, a further profit of Dh 3 500 (Labrousse and Romero, 2001).

Hash oil is more concentrated and valuable than hashish itself, and is also easier to conceal and to transport. 10 kg of hashish is needed to produce 1 kg of oil. The techniques for hash oil production were introduced to Morocco in the 1960s following Lebanese and Pakistani methods, in what is claimed to be a dual initiative of both foreign and Ketami traffickers to address export demand and to increase the value of their products (Labrousse and Romero, 2001).

Farm prices and export prices

Cannabis offers a good source of income for small farmers in an underdeveloped region, even though the farmer only receives a small part of the retail price of hashish. According to UN data for 2003, farmers sell 1 kg of resin for Dh 1 400, or about EUR 130. In Spain, the same kilogram could be sold for EUR 2 725 at wholesale prices (UNODC, 2007) or around EUR 4 400 at retail prices (EMCDDA, 2006).

Export prices in Morocco vary considerably, depending on quality, amount purchased, place of acquisition, etc. If bought directly from the farmers, a gram of best quality hashish (*sputnik, doble cero*) could reach a price of EUR 0.45 to EUR 0.75 ⁽⁶⁾. Second- or third-rate hashish will get a third of that (Labrousse and Romero, 2001). In our own research we have found prices as low as EUR 0.10 per gram, or EUR 100 per kg for larger quantities. A common price of second-rate hashish would be EUR 0.50 per gram for those who smuggle up to 1 kg. In one field trip to Chefchaouen in 2001, for instance, we knew of three Spaniards who bought 500 g of second quality hashish at Dh 8.5, about EUR 0.60, per gram. They felt cheated, because the sample they were shown in advance was of much better quality. However, they retailed most of the batch in Spain at about EUR 4.00 per gram, which paid for the costs of their trip, together with a small profit.

Comparing different sources, including our fieldwork, we estimate that export prices oscillate between EUR 0.10 and EUR 1.00 per gram of hashish. The total country earnings of the Moroccan hashish industry includes farmers' revenues, exporters' profits and remittances from Moroccan traders and dealers abroad. If about 2 200 tonnes of Moroccan hashish were successfully exported in 2003, earnings could be estimated in the range of EUR 1 billion to EUR 1.5 billion. In any case, earnings are multiplied by a factor of 8 to 10 when sold in Europe. Compared with the price paid by consumers, at about EUR 5.4 per gram of resin, the total turnover of the market for Moroccan cannabis could be estimated at EUR 12 billion. Yet most of this is generated in European markets and is invested in Europe.

⁽⁶⁾ In 2001 we noted that in a café in Chefchaouen, a 10 g egg of good quality hashish retailed at around EUR 1.50 for foreign customers.

The commodity chain of hashish: private and public actors

Smallholders in the *Rif* economy grow cannabis plants both in rain-fed and irrigated plots. They often hire labourers in summer months, mostly in August, to harvest the plant. Once harvested and dried, plant material is sold to middlemen who extract the sticky dust, especially from the tops of the female plants, press it into balls or blocks of hashish and often adulterate it. Intermediaries then stockpile large amounts of the product in central locations such as Tangier, Tetouan, Al Hoceima and Asilah and have the resin sent to Ceuta and Melilla or across the Strait of Gibraltar to Spain. From Spanish locations, the product is then distributed to all European countries directly, or to the Netherlands, which serves as a secondary distribution centre for northern Europe (Korf and Verbraeck, 1993; De Kort and Korf, 1992).

A pyramid-like structure may be at work, with middlemen buying *kif* or *sandouk* from peasants and producing blocks of hashish of different qualities, stockpiling them, and transporting them to storehouses (Labrousse and Romero, 2001).

Cannabis fields are visible from the roads, and there is no attempt to hide them. Every summer, busloads of workers arrive to work in the *kif* harvest and thousands of tonnes of plant product are moved, apparently within reach of police officers. Bribery may be widespread, and a local joke tells of traffickers who count distances by the number of bribes they have to pay (Labrousse and Romero, 2001; Ketterer, 2001).

Some cannabis resin networks use a legal business as a façade and have no difficulty recruiting from the young and unemployed in what is a poor region. Among the higher echelons, there is evidence that the hashish trade has become industrialised. The *Observatoire Géopolitique des Drogues* (OGD) notes that hashish exporters are involved in large Moroccan firms in agribusiness, fishing, transportation, and import–export operations. There is some speculation that this would mean a shift away from the Tangier cartels and toward the Casablanca cartels, which are more acceptable to the government because they do not contest state power in the same way (Ketterer, 2001).

Export practices serve to link expatriate Moroccans in different European countries with drug distributors in the target country. Drug money has changed the consumption patterns of the region. Ketterer recently described the scene:

Driving east from Tangier along the Mediterranean coast, the signs of drug power are obvious: heavily guarded villas with strangely stylised pagodas, frequent roadblocks with police looking for the next payoff and an endless supply of young men going about their workdays in the drug business.

(2001)

Corruption of public officials is part of the operating routine of illegal businesses (Reuter, 1984). In the case of the Moroccan cannabis resin trade, it is difficult to avoid the conclusion that involvement or interested acquiescence of law enforcement officials must be widespread, considering the level of cultivation, storage and export in place. Some scandals have revealed the involvement of powerful actors in the Moroccan political scene. For instance, in November 1995, data from a secret report of the OGD appeared in the French newspaper *Le Monde*, alleging public sector corruption had reached the highest political levels, including the royal entourage (⁷). The Moroccan government sued the newspaper. A backlash against the drug trade produced several notorious arrests and trials in the following months and years. These revealed the connections that operated in the hashish trade between public officials and entrepreneurs.

Two major drug traders had become leaders of networks in the north and had become a threat to state power. One of them, Yakhaoufi, was arrested in late 1995. His subsequent trial revealed a sophisticated and massive organisation with international scope. His own organisation transported hashish out of the central Rif, stockpiled it in Tetouan, shipped it to Spain by sea, then delivered it to wholesalers in Amsterdam. In addition to bank accounts in Morocco, Spain, Gibraltar and Canada, along with a yacht and 15 cars, Yakhloufi boasted of personal, commercial and political ties to the Castro regime in Cuba. These ties facilitated contacts with the Colombian cocaine cartels, which craved Morocco's easily penetrable borders as distribution points into Europe. Yakhloufi was sentenced to 10 years in jail and died of an apparent heart attack in 1998. 'He was too dangerous — he knew too much,' said one Tangier street dealer of Yakhloufi's death (Ketterer, 2001).

A second major figure in the cannabis resin trade in Morocco was H'midou Dib. He retains folk hero status in northern Morocco. A former fisherman, he constructed his own port in Sidi Kankouch on the coast north of Tangier, which was an embarkation point for a steady stream of speedboats. Dib constructed an enormous network of loyal foot soldiers and villagers eager to protect him. He supplied jobs, built mosques, delivered social services and kept the despised authorities at bay. Dib was also involved in complex real estate transactions in Tangier, money laundering operations and other elements of organised crime.

The Dib trial revealed other links between drug traffickers and government officials, including two advisors to former governors in the Tangier province, three civilian police colonels, the military police colonel in charge of coastal surveillance and three former chiefs of the Tangier urban judiciary and national security police services. Some of these officials were fired, arrested and tried, but it is clear that the cleansing campaign of the mid-1990s did little to curb the growth of the drug trade or its ties to official Morocco (Ketterer, 2001).

(⁷) See www.ifex.org/en/content/view/full/60123 for further details.

Sociopolitical and ecological consequences

The cannabis industry has had powerful effects on the society of northern Morocco, the ecology of the region and its political relationships with the rest of the country. Cannabis plots have expanded so fast and so far into hillsides that they are causing soil erosion and the destruction of old forests (Bowcott, 2003; Labrousse and Romero, 2001). Moreover, they compete with the best land for traditional food products and now the region is dependent on food imports. On the other hand, the Rif has traditionally been an impoverished region, discriminated against in investment and infrastructure and driven by resentment towards the central government and the accumulation of wealth and power in the hands of a few. In the years after independence, people in the region revolted and were subjugated by military intervention that caused thousands of deaths (OGD, 1996).

Today, the economy of northern Morocco depends heavily on the *kif* trade and is becoming a society of smugglers, both of people and commodities into Europe, and manufactured goods into Morocco, with multiple links with Costa del Sol real estate business, Gibraltar offshore banks, and Ceuta and Melilla smuggling organisations. Furthermore, the drug trade affects the crime situation in the country. Some networks of drug traffickers are very often involved in other drug-related crimes and activities. Moreover, there are certain crime prevention-related phenomena inherent to the country and its traditions, namely child labour, some involvement of underage recruitment in liberation movements (mostly in the Western Sahara region), trafficking of human beings and smuggling of migrants (UNODC, 2003).

A young, growing and often restless population looks to the other side of the Mediterranean for jobs, money and a better future. As Ketterer (2001) observed, northern Morocco represents a challenge for the Moroccan state. The region has a potent mix of discontent, drugs, organised political opposition and religion. Morocco's drug barons have steadily become a serious crime problem and security threat, and also major players in the domestic political system. Moreover, there is a growing evidence that violent Islamist cells have become involved in the hashish trade both in Morocco and in Spain. Tragically, several major terrorists acts have been funded with hashish money (Wilkinson, 2003). The two most important so far are the bombing in Casablanca in May 2003, which left 32 people dead; and the train bombings in Madrid in March 2004, that killed 192 people and injured over a thousand ⁽⁸⁾.

⁽⁸⁾ See, among others, 'La masacre financiada por el narcotráfico' [The massacre funded by drug trafficking], *El Mundo*, 15 April 2004.

The other side of the Strait: smuggling *kif* into Europe

Hundreds of tonnes of hashish are smuggled into Europe every year from the *Rif*. This is a multifaceted export–import industry which enriches thousands of people. Balls, blocks and packages of hashish and hashish oil are carried to Europe by speedboat, fishing boat, cargo ships, cars, vans, trucks, small aircraft, and individuals who carry the drug in their bags, their clothes or their bodies (⁹). Hashish is hidden beneath vegetables, fish, wood and any other commodities crossing the Strait. Lately, Moroccan hashish and Latin American cocaine have been smuggled together, and South American networks are using West African connections with bases in Morocco to smuggle cocaine into Europe.

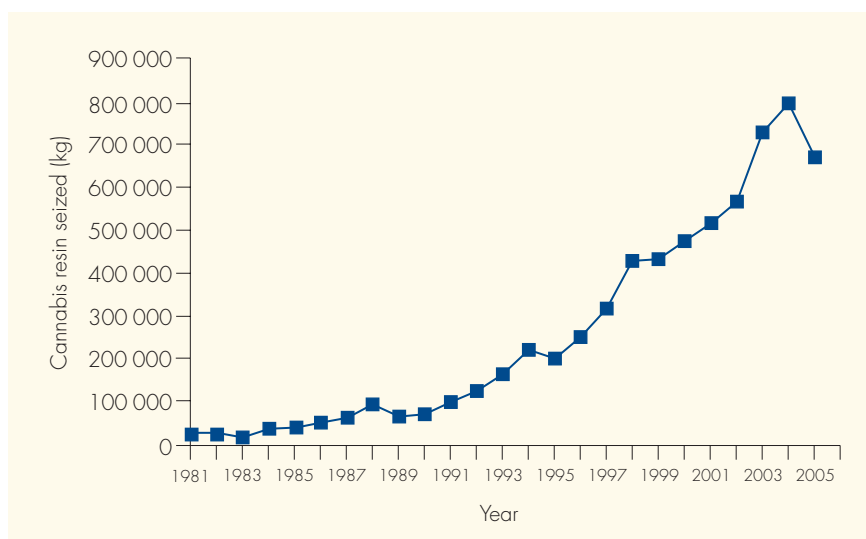
In Spain most hashish is seized at sea or in coastal areas, including docks, harbours, beaches and local roads. The most common route of entry crosses the provinces of Cádiz and Malaga, bordering the Strait of Gibraltar. However, more and more quantities have been seized as far away as Catalonia in the east, and Galicia on the north-west Atlantic coast, as drug smugglers use both faster and larger boats. One of the reasons for this displacement of smuggling routes may be the stricter control of the Strait trying to curb illegal immigration.

The constant growth of the hashish trade

If enforcement agencies' data on seizures are an indicator of this trade, and not of police resources or priorities, the evolution of cannabis seizures in Spain shows the substantial growth of this drug industry in the last 15 years. Spain has recorded a continuous rise in cannabis resin seizures since 1980, reaching over half a million kg a year by the 2000s (Figure 2). Spain alone seizes more hashish than the other 26 countries of the European Union (plus Norway) together. The increase might partly reflect the increase or improvement of police resources. However, the rise in confiscations in Spain parallels the spread of cannabis crops in the *Rif*, with the moderate tail-off reported for 2005 reflecting the reduction in cultivation reported since 2004. It is thus plausible that the increase in confiscations in Spain is mostly due to growth in the hashish trade. By comparison, seizures in Morocco have fluctuated throughout the last decade (Table 2).

(⁹) The World Customs Organisation splits cannabis resin seizures as follows: vessel, 56%; vehicle, 42%; air, 1%; mail, 0.1% (Pierre Bertrand, WCO RILO unit, meeting at the EMCDDA, 29 November 2004).

Figure 2: Seizures of cannabis resin in Spain (kg), 1981–2005



Demand/supply: prices in Spain and Europe

Retail prices for cannabis resin vary greatly within and between European countries (see Carpentier, this monograph), with average prices reported in Europe at between EUR 2.30 (Portugal) and EUR 12.50 per gram (Norway) (EMCDDA, 2006). Average prices of cannabis resin, corrected for inflation, fell over the period 1999–2004 in EMCDDA reporting countries except in Germany and Spain, where prices remained stable, and Luxembourg, where a slight increase occurred (EMCDDA, 2006). In Spain prices tend to increase as one moves north. In Seville or Granada, for instance, in 2003 retail prices of hashish ranged from EUR 2 to EUR 5 per gram, while in Bilbao or Barcelona they commonly ranged from EUR 3.5 to EUR 7. The quality of Moroccan hashish seems to oscillate considerably, although its potency has remained in a

Table 2: Seizures of cannabis in Morocco (kg), 1995–2005

	1995	1996	1997	1998	1999	2000
Herb	35808	38521	27956	37161	46136	83720
Resin	110245	64769	71887	55520	54755	143946
Total	146053	103290	99843	92681	100891	227666

	2001	2002	2003	2004	2005
Herb	68169	88529	69058	318610	115000
Resin	61356	66394	96306	86800	92423
Total	129525	154923	165364	405410	207423

Source: UNODC, 2007.

range of 5–14%, with little sign that it has increased in the last decade (see King, this monograph). If export prices range from EUR 0.15 to EUR 0.60, retail prices provide a margin of 16–80 times cost. This is an important price differential, and the main incentive for the international trade, but does not seem larger than other drug businesses (see Moore, 1977; Reuter, 1985; Reuter and Kleinman, 1986; Wagstaff, 1989; Reuter et al., 1990).

Event analysis from a sample of newspaper articles

We have applied to this topic an event analysis methodology developed by historians for the study of collective actions such as strikes and social protests across a wide time span (see Olzak, 1989; Franzosi, 1995). In this methodology, events are commonly defined as non-routine, collective, and public acts. The first step in this method is to establish formal rules for coding information on collective events using records from archives, newspapers, historical documents, and police and magistrate records. This allows information on different aspects of a particular type of collective action to be measured and compared across social systems or across time periods, as data are collected in commensurate dimensions (Olzak, 1989).

Historians have observed that newspapers provide the most complete account of events for the widest sample of geographical or temporal units (Tilly et al., 1975) and, despite the limitations of the newspapers as a source of socio-historical data, they often constitute the only available source of information. ‘Exclusion of newspaper data would prevent research in fields where no alternative data are available’ (Franzosi, 1987). This is especially apt in the case at hand. However, as Franzosi has noted, ‘the validity of newspaper information is questionable: newspapers differ widely in their reporting practices and news coverage’. ‘The values, routines, and conventions of news organisations constrain the amount and nature of coverage devoted to any story’ (Kielbowicz and Scherer, 1986). Nevertheless, in using mass media reports, the type of bias more likely to occur ‘consists more of silence and emphasis rather than outright false information’ (Franzosi, 1987). In the study of illegal enterprises it is evident ‘that no data source is without error, including officially collected statistics’, but ‘in the absence of systematic and comparative validation, there is no *a priori* reason to believe that data collected from newspaper would be less valid than other commonly used sources’.

The sample of events

We have reviewed over 2 000 news reports from the newspaper *El País*, concerning cannabis seizures from May 1976 to December 2003. They describe 1 370 failed

schemes or projects of smugglers or distributors. On average, these events represent 40.2% of all cannabis seized during this period in Spain, with a considerable variation from year to year (standard deviation: 21.7). In total, our sample includes reports of about one out of every three groups detained in Spain for hashish trafficking in this 27-year period. We chose *El País* for the quality and consistency of its reporting concerning social issues, and because it is the only newspaper that is edited throughout Spain with local editions in all major regions, and, more importantly, because it has indexed all of its issues published since its first edition in May 1976. We have attempted to check the selected cases found in *El País* against other news and police reports of the same events. Our analysis is still ongoing, and the results we present here are provisional and tentative.

The organisation of smuggling and distribution of hash into Spain

We can draw some preliminary conclusions from our sample of events. In Table 3 we present the number of episodes described in our sample by the amount of cannabis seized. In most cases the substance confiscated was hashish, although some herbal cannabis was also seized, in particular during the 1970s and in the last decade.

When examining the 1 370 operations we found that over 800 regional distributors and importers were involved. Almost all of those arrested with over 500 kg of hashish were smugglers or large-scale distributors. It is important to note that some of the

Table 3: Number of seizures by amount seized, news events sample from *El País* (1976–2003) ($n = 1\,370$)

Amount (kg)	<i>n</i>	%	% accumulated
1 or less	86	6.3	6.3
2–9	76	5.5	11.8
10–49	156	11.4	23.2
50–99	94	6.9	30.1
100–499	331	24.2	54.2
500–999	197	14.4	68.6
1 000–4 999	363	26.5	95.1
5 000–9 999	37	2.7	97.8
10 000 or more	30	2.2	100.0
Total	1 370	100.0	100.0

groups or individuals caught with smaller amounts, even those arrested with less than 1 kg, were also smugglers. Large import operations of 1 000 kg or more became more frequent from 1990 onwards (Table 4). This is coherent with the growth of total seizures that surpassed 100 tonnes in 1990 and 1991. In the 2000s, the level of operations seems to have increased even more. We have found data on 430 groups that imported between 1 and 36 tonnes. On average, 3.4 tonnes were seized in these operations, although there is great variation in this sample (standard deviation: 4.5). On average, 7.4 people were arrested by project or police raid (mean: 4.5). The size of these groups varied a great deal (standard deviation: 10.6). In one case, 97 people were arrested in several European countries in a connection with a wide transnational ring of smugglers, distributors and money launderers; in some cases only one person was arrested, for instance, the driver of the truck.

Table 4: Number of seizures larger than 1 000 kg by period, total news events from *El País*, Spain, 1976–2003 ($n = 1\,370$)

Years	<i>n</i>	%	% accumulated
1976–1979	5	1.2	1.2
1980–1984	10	2.3	3.5
1985–1989	27	6.3	9.8
1990–1994	120	27.9	37.7
1995–1999	122	28.4	66.0
2000–2003	146	34.0	100.0
Total	430	100.0	

Nationalities of smugglers and traders

We were able to identify the nationality of people arrested in 757 cases. Over a third of all groups (38%) were formed by Spaniards working with Spaniards (Table 4). Moroccans working with people of their nationality formed the second most frequent type (19%), and groups of nationals from other European countries formed the third most common type. When people from different nationalities cooperated within range of Spanish police, the most frequent combination was that of Spanish and Moroccan nationals (8% of all groups arrested). Spaniards working with other Europeans was also a common type of association, representing 5.5% of all episodes in our sample (Table 5).

We observed a correlation between the size of the haul seized and the nationality of the members of the distribution groups. Furthermore, nationality was linked to the dominant task of the organisation. Almost all retailing is done by Spaniards working alone or in small groups of same-country nationals. Moroccan immigrants were commonly

Table 5: People arrested for trafficking or distributing cannabis in Spain, 1976–2003 — composition of groups by nationality, news events sample (n = 1 370)

	1 kg or less		1–9.9 kg		10–99 kg		100–999 kg		1 000–4 999 kg		Over 5 000 kg		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Spaniards	50	86.2	33	57.9	64	41.6	74	28	60	32.4	6	15.4	287	37.9
Moroccans	1	1.7	7	12.3	43	27.9	67	25.4	20	10.8	4	10.3	142	18.8
Other Europeans	1	1.7	9	15.8	16	10.4	56	21.2	38	20.5	–	–	124	16.4
Spaniards–Moroccans	–	–	–	–	11	7.1	26	9.8	19	10.3	3	7.7	59	7.8
Spaniards–Other Europeans	1	1.7	–	–	5	3.2	15	5.7	18	9.7	3	7.7	42	5.5
South Americans	1	1.7	–	–	4	2.6	–	–	1	0.5	2	5.1	8	1.1
Other Europeans–Moroccans	–	–	–	–	–	–	8	3	8	4.3	4	10.3	22	2.9
Spaniards–Other Europeans–Moroccans	–	–	–	–	–	–	13	4.9	7	3.8	5	12.8	25	3.3
Other combinations	4	7	8	14	11	7.1	5	6.8	14	7.6	12	30.8	48	
Total	58	100	57	100	154	100	264	100	185	100	39	100	757	100

found in small smuggling and wholesale operations involving less than 100 kg. French, British, Dutch and other Europeans were also important in smuggling these quantities, and sometimes they transported cannabis from Morocco. Often, however, for these quantities the traffickers sourced the cannabis from Spain before shipping it to France, the UK and the Netherlands. In large-scale smuggling, the role of foreigners tends to be proportional to the size of the cargo. Besides Spaniards, French, Dutch and British nationals were commonly involved in smuggling between 1 and 5 tonnes of resin. In the largest, multi-tonne schemes, the groups tended to be more complex and international, and some of the combinations are not reflected in Table 4. For instance, South Americans appeared to be progressively associated with Spaniards and Moroccans in smuggling operations of over 5 tonnes.

We were able to collect information on the nationality of members of 224 groups of importers dealing with one or more tonnes of cannabis resin. Most of these groups were composed of non-Spanish Europeans (40%), followed by groups in which Spaniards cooperated with other Europeans (30%). It is important to note that the data cover only people who were arrested in Spain and do not provide information on all the members of transnational drug-dealing organisations. Thus, it underestimates the level of international cooperation in cannabis trafficking to Europe.

Hashish trafficking and gender

In 280 cases the sex of traffickers was specified, and about 19% were women. Women were especially active in the lower ranges of the hashish trade. Thus, in the groups dealing with 1 kg or less, a third were women working alone or in association with men. In the range of over 1 kg to 50 kg, 29% of all arrestees were women, often dealing in same-sex teams. In the higher echelons of the trade, however — defined as those involving 500 kg or more — less than 5% of arrestees were women, and they always worked in groups led by men. Mixed gender teams were present in all levels of the trade; 11% of all groups were of mixed gender. We found two culturally defined feminine roles culturally sanctioned in the hashish trade — one was sanctioned by the derogatory labels of ‘culeras’ and ‘vagneras’, or mules who conceal the drug in their rectums (‘culo’, ‘ass’) and vaginas. The other involved middle-aged women with grown-up sons and daughters leading family networks in unstructured families and destitute neighbourhoods. Evidently, this is a male-dominated market and women often experience processes of exclusion and exploitation.

Types of organisations and networks

We have found a variety of organisations and networks involved in smuggling and distributing cannabis resin into Europe via Spain. They vary in structure, strategy and main tasks. Case examples of the schemes and groups included in the newspaper corpus serve to illustrate key aspects of smuggling networks, such as their size, tactics, roles, tasks and permanence in the trade. These are crucial elements in the organisation of illegal enterprise (Haller, 1990; Dorn et al., 1992).

The smallest unit of smuggling and distribution

The smallest unit of smuggling and distribution is formed by individuals or by small groups of two or three people who carried the drug in their bags, clothes or within their stomachs, rectums or vaginas. They do not need much investment or organisation, and can repeat their schemes several times every month, or not at all. They are 'freelancers', in the typology proposed by Natarajan and Belanger (1998).

In the early 1980s, trips to the Spanish enclaves of Ceuta and Melilla in northern Africa or to Tangier or Tetouan to import small amounts of hashish, often within one's own body, became a sort of rite of passage for many novices of the Spanish drug wave. In slang, the adventure was known as '*bajar al moro*'. A theatrical comedy and the subsequent film of this title were commercial successes. The film, somehow, reinforced the gendered hierarchies of the trade, as the protagonist had to lose her virginity to be able to make such a trip to a 'Moorish' country. What follows are several examples of this level of trafficking.

Case 1 A 60-year-old 'mule'

In May 1985, a 60-year-old woman went to the emergency room at the hospital in Ciudad Real, a city in central Spain. She could not defecate the 96 10-g 'eggs' of hashish she had swallowed in Morocco. She had to undergo several surgical procedures to extract what had become a large pulp of hashish. She was later indicted for drug trafficking (*El País*, 1 May 1985). This case reflects the not infrequent involvement of older women in the hashish trade. They may transport drugs in order to pay for their family's needs, sometimes with the help of male members of the family.

Case 2 Three Frenchmen who loved oil

Three young Frenchmen bought 80g of hash oil in Tetouan. They sealed it in packages made with condoms, swallowed them, and crossed into Spain through Algeciras. In

Madrid, one of them felt very sick and his colleagues took him to the hospital. The police were called (*El País*, 10 April 1980).

Case 3 An individual multikilo importer

In September 1989, a 28-year-old Moroccan was arrested in Almería's harbour when getting off the Melilla ferry. He was carrying two suitcases with 45 kg of cannabis resin. He was on his way to Córdoba. Police estimated that the drugs were worth 9 million pesetas, or about EUR 1.20 per gram wholesale (*El País*, 12 September 1989).

Case 4 Small-scale smuggling from Spain into France

In November 1992, four women were arrested in Madrid's Chamartín train station when they were boarding the Bordeaux train with 32 kg of hashish in their bags. It seems that they were related. Two of them were Spanish, a 54-year-old woman and her 26-year-old daughter, and the other two were French nationals, a 26- and 19-year-old. They were travelling with two babies. They had arrived two days before, exchanged a large amount of French currency in the station bank, took a taxi to Madrid Airport, and flew to Málaga. Upon their return, their bags were searched by suspicious police officers. They had made similar trips in June and September of the same year (*El País*, 26 November 1992).

This appears to be a case of small-scale smuggling from Spain to France. It is possible that these women were wholesalers or retailers in France. There was some continuity in their projects, and they may be an example of a family business, in the typology proposed by Natarajan and Belanger (1998).

Smugglers for multiregional distribution

The second type or level of drug trade organisation includes networks that smuggle hundreds of kilograms using boats, trucks, or even small aircraft. Often they work together with importers or regional distributors in other European countries, and maintain, at least for a period, some continuity in their operations.

Case 5 By air: importation and regional distribution

In February 2000, Spanish police forces were suspicious of wholesalers in four provinces that followed similar routines. They were able to trace a common contact in Seville, and learned of an incoming shipment arriving at a makeshift airfield in the Cadiz countryside. There they seized 639 kg of 'pollen' or high-quality resin, and five high-end

cars. A light aircraft made the three-hour round trips from a small airport in Seville to Morocco and back, with an intermediate landing in countryside locations. Seven people were arrested at the landing grounds. The financier and an aide were arrested on their return from Morocco. In the financier's home the police found 40 million pesetas in cash (about EUR 240 000). All arrestees seemed mature, knowledgeable and careful. Their average age was 38. Police found that they had been conducting regular flights to Morocco, often at night, for several months.

This appears to be a case of importers linked to regional distributors and wholesalers, with a clear hierarchy and division of tasks based on resources, contacts and expertise. They seemed to work exclusively in Spanish regional distribution covering a large area. They exhibited some permanence and repeated the same *modus operandi* over several months.

Large-scale importers for an international market

A higher level of operations is reached when tonnes of hashish are smuggled into Spain and sent to other European countries for wider distribution.

Case 6 Middle-tier distribution network: smuggling to the wider Europe

In March 1977, the British yacht *Cynosure* was seized in Palma de Mallorca's harbour. In the yacht's stores the Spanish police found over 2000 kg of hash in sealed packages. Two French sailors were arrested on the spot. The captain and owner, a prominent businessman from the Balearic hotel trade, fled but was arrested in Amsterdam some weeks later and extradited. The cargo had been transferred to the yacht from a fishing boat in Betoja's Bay in northern Morocco. The two French sailors had been hired in Ibiza to sail the yacht from Morocco to Southern France. Near Mallorca the engines failed, and in their search for help they provoked police suspicion. There was evidence of previous trips by the *Cynosure* from Moroccan ports to Southern France, with stops in the Costa del Sol, Costa Brava and Mallorca. Here we see a small organisation, linking Morocco and France, with a minimal hierarchy and distribution of work, and some recurrence in their operations.

The industrial level

The higher level of the cannabis resin export–import industry is composed of groups that deal with dozens of tonnes at a time in industrial scale operations.

Case 7 Large-scale smuggling: an electric train in a cave

The sophistication of the higher echelons of the cannabis resin import industry was revealed in July 1988 when police discovered one of the largest stashes of hashish on record in a cove near the Costa Brava resort of Lloret de Mar in north-east Spain. Smugglers had constructed a 50-metre tunnel through a mountain that connected the beach to a cabin in a field via a small train. In the tunnel, police found 15 tonnes of cannabis resin. Another 2 tonnes were found in a farm nearby. Air conditioners and humidifiers maintained the hashish's quality, and refrigerated trucks took the product to markets in France, Britain and West Germany. Six people were arrested, all in their 40s and 50s. A Corsican and a Spaniard were the leaders of the group. The Spaniard had already been prosecuted in 1981 when found with 2.5 tonnes of hashish. Police claimed that 'The Corsican', as the second leader was known, was considered the chief of a ring of international smugglers (*El País*, 26 July 1988). He was a French citizen who owned several restaurants on the Costa Brava. One of these restaurants had been attacked with a bomb three years before. His arrest was world news, and he was related to the Corsican Mafia (see *Time* article, 'Smugglers On Ice', 8 August 1988). In 1992, when the trial took place, it became evident that the group had been operating for some time, and probably was responsible for the smuggling of hundreds of tonnes of hashish (*El País*, 16 July 1992). 'The Corsican' was arrested again in June 1997 in relation to another haul of 6 tonnes of hash seized near Barcelona. Six people were arrested. He had, at the time, been out of jail for less than a year (*El País*, 24 June 1997).

This is an example of a section of an international network, armed and well organised, with credit and capacity to invest in infrastructure and the trafficking of tonnes of cannabis resin in every operation. These traffickers had been in the business for over 15 years, although it seems that much of this time they were inactive.

Case 8 A freight cargo with fish meal

Early in 1996, customs officers in Marín, a small harbour in the Galician coast of north-western Spain unloaded thousands of 10-kg hashish packages hidden beneath fish meal in the storerooms of the *Volga One*, a 49-metre cargo ship registered in Panama that had arrived that day. Three months before, the same ship, with a different name, had unloaded a legal cargo of 260 tonnes of tuna fish. This time, 36 tonnes of Moroccan hashish were hidden beneath a cargo of 90 tonnes of fish meal. The ship picked up its cargo in Asilah, a small harbour in the Atlantic coast south of Tangier. Most of the eight crew members were Russians. This was the largest seizure of hashish on record, and 11 people were charged. A highly indebted businessman from the Canary Islands, with experience in food imports, appeared to be the financier and the contact with Dutch and Moroccan distributors. A Galician entrepreneur linked to tobacco smuggling and cocaine importers seemed to have organised the shipment and local storage. A trade

union leader and a prison officer were also charged. The 'Canario' entrepreneur had USD 2.5 million in cash, mostly in Dutch currency, when apprehended.

Here, we see a coalition of entrepreneurs working together on a large project. Individuals from at least four countries were playing roles according to their expertise and capacity: financiers and buyers of the drug, organisers, wholesalers, ship crews, transporters and Dutch importers. The network they had developed, however, seemed transitory, project-oriented, and non-hierarchical.

In this simplified overview, we have shown the emergent lines of a pyramid that includes various actors performing different tasks in association or competition. Our sample reveals only failed schemes, and of those, only the portion operating in Spain. Obviously, the limitations of our sample are considerable. Further work is necessary to document networks operating in other countries at both ends of the commodity and the financial chains followed by hashish and the money that pays for it. Thus, much work remains to be done in Morocco, Gibraltar, Costa del Sol and in the receiving European countries.

Violence in the hashish market

Violence in the hashish market seems to be much less frequent and serious than in the cocaine and heroin markets, although perhaps in both cases its effects tend to be exaggerated. As Reuter observed, 'there are many limitations on the use of violence as a tool for competition, that only in very narrowly defined circumstances can violence be used to suppress competition' (Reuter, 1984). We found violent acts in three realms of the hashish trade: in connection with large networks in which some associates abandon their duties; in retailing, where some dealers (in Spanish: 'camellos') and clients fight over prices, money, thefts, etc., and when traffickers react violently against enforcement officers. Here we present some examples.

In June 1990, a suspected hashish dealer was arrested in Madrid when he knifed a client in a central square notorious for the drug scene (*El País*, 27 June 1993). In the Costa del Sol there have been some cases of murders related to hashish trafficking, apparently related to unpaid debts (see *El País*, 20 January 1993). In 1996, a 'mule' who did not deliver the drug he was given in Morocco to bring to Spain inside his body was kidnapped (*El País*, 6 June 1996). There was also the case of an international criminal network that poisoned two importers who had apparently sold adulterated hashish. Following this incident, one of the dealers attacked became a police informant (*El País*, 10 May 1994). In another case, a group was using 15-year-olds to smuggle hashish within their bodies from Ceuta, and used intimidation and violence to coerce the minors (*El País*, 11 October 1995).

In our sample, episodes involving violent acts are few and far between, and the atmosphere in the hashish trade does not seem as threatening or violent as that of the cocaine industry. Violence and intimidation may be a means to solve disputes in the hashish market, and to enforce contracts and obligations. But, at least on the European side in Spain, there is little sign that it is used to maintaining monopoly or oligopoly conditions, which would prevent people from entering this trade.

Concluding comments

The market for hashish in Europe has grown substantially in the last three decades and has stimulated the spread of an illicit plantation and manufacturing economy on the other side of the Mediterranean. Today, 22.5 million Europeans are reported to have consumed cannabis in the last year (see Vicente, this monograph). Two major products dominate the European market: a relatively standardised cannabis resin, and domestically or Dutch-grown herbal cannabis. Most of Europe’s cannabis resin originates in Morocco and is imported through Spain, and then often taken to the Netherlands to be distributed in northern countries (UNODC, 2007).

Cannabis-related policies are contentious issues in international relations. European countries have often been accused of leniency regarding cannabis use and possession, as occurred in the meeting of the United Nations Commission on Narcotic Drugs (UNCND) held in May 2002. The growing links and transfers of people, commodities and ideas from both sides of the Mediterranean have facilitated the explosion in the production of hashish. The multiple transactions and displacements to and from Morocco facilitate the smuggling of hashish.

The rapid growth of cannabis resin production in Morocco is a dramatic phenomenon. Cannabis resin is the most successful Moroccan export of the last quarter of a century. For northern Morocco it has been a mixed blessing. In the short term, it may be helping to alleviate some social and political tensions, providing a source of foreign currency in a region in which underprivileged, forgotten and resentful citizens are pitted against their government. However, it is also increasing corruption, raising local prices, and cutting incentives for local production of legal crops and other goods. Long term, the drug trade could produce nastier effects if it leads to an increase in the local consumption of hashish and other drugs, or if the European demand for cannabis diminishes and the Rif turns to other crops, for instance opium poppies. Growing links between hashish and cocaine traders may prove ominous.

The structure of drug export–import organisations

From our limited review of importers and distributors arrested in Spain, we will venture some observations concerning the types of organisations and networks involved in the trade.

First, the hashish trade, like most illegal markets, is a service industry and ‘the bulk of total cost of getting the final good to the consumer is not production but compensation to those involved in the distribution of the drug from production point to the final consumer’ (Reuter, 1984). Technologically, the hashish industry is very simple. There is little transnational cooperation in the manufacturing of the product, and chemical precursors are not needed. The hashish industry is mostly a storage and transport industry. Some initial investment is necessary for seeds and fertilisers, and to buy raw material from farmers. As in other drug industries, ‘capital in this business consists almost entirely of an inventory which is turned over very rapidly and the “goodwill” built up by knowing good suppliers and customers’ (Reuter and Haaga, 1989). Thus, the cost curve of cannabis resin distribution is likely to be determined by human factors (Reuter, 1984).

Second, although our data are partial and preliminary, they echo the findings of authors who have been analysing drug dealing networks or organisations from a relational or industrial organisation perspective. For instance, Reuter and Haaga explored careers and organisations in the upper levels of the cocaine and herbal cannabis markets, and found that successful operations did not require ‘a large or enduring organisation’. More or less formal organisations may exist, but are not indispensable for ‘operational or financial success’. Relationships between partners ‘were more like networks than like hierarchical organisations’ (Reuter and Haaga, 1989). Therefore, the relational aspects of the drug industry may play a crucial role in its structure, although few studies have focused on this topic. Morselli (2001) has recently reviewed the operational methods of a long-term distributor of hashish, and found that he never worked within an organisation but was able to operate via his own strong and weak links within a very wide social network.

As we have shown, the major groups working in smuggling hashish present a hierarchical division of roles and tasks, but this structure seems to be transitory and informal. As Reuter and Haaga noted, asymmetries of information ‘would preclude formal organisation’ (Reuter and Haaga, 1989). Participants often work as independent specialists or salesmen, hired for one project, more like freelancers or specialists. Thus, Morselli concludes that ‘informal cooperation rather than formal organisation’ is a more suitable notion to describe the links of those participating in drug importing (Morselli, 2001).

In sum, hashish smuggling and distributing firms tend to be informal, changing and decentralised, more cooperative than corporative. As Zaitch (2002) has found concerning cocaine import groups in the Netherlands, hashish trading organisations are more flexible than the notion of a ‘cartel’ suggests. Some are individual enterprises. Others adopt the form of temporary partnerships between two or three persons who collaborate in a single project. Individuals who function as brokers play a central role in bringing about these coalitions for specific transactions or projects (Zaitch, 2002; Morselli, 2001; Korf and Verbraeck, 1993). Larger operating groups rarely involve more than nine persons, and the division of labour is not rigid or compartmentalised along vertical lines, and despite the importance of kinship ties and the frequent use of relatives, few of these enterprises are ‘family businesses’ (Zaitch, 2002).

Our results indicate that the organisations in this trade seemed more cooperative than hierarchical, and were based on network modes of resource allocation where transactions occur neither through discrete exchanges nor by administrative fiat, but through networks of individuals engaged in reciprocal, preferential, mutually supportive actions (Morselli, 2001). It is probable that the structure of drug organisations is somehow different in Europe and Morocco, for a number of reasons. One area of difference stems from the varying roles of the state institutions and officials on both sides of the Strait. Furthermore, the need to grow, harvest, collect, manufacture and store the product on a yearly basis may promote more stable transactions and, perhaps, networks and organisations in Morocco. However, we know very little direct information about groups based primarily in Morocco.

Competition and disorganised crime

The hashish trade seems relatively open and competitive, although competition seems greater at the lower echelons of the market. There is no evidence of smuggling cartels or oligopolies operating in the Spanish side of the trade, and even the existence of large, stable organisations is doubtful. This is more difficult to ascertain for the Moroccan side.

We know that some entrepreneurs have been able to remain involved in the cannabis trade for decades, but for long periods of their careers they were inactive for their own reasons, or because they suffered arrests, trials and incarceration. In any case, most entrepreneurs seem to work ‘without having the organizing force and support of a reputed and resource-yielding criminal organisation’ (Morselli, 2001). Instead, they may rely on legal enterprise for a more permanent business structure and stable contractual relationships for some of their associates.

In some cases, one small group, even a single individual, runs the whole pyramid, buying from Moroccan farmers, smuggling it into a European country and retailing the drug to consumers. But larger operations reveal considerable complexity and

coordination of people in Morocco, Spain and other European countries buying, storing and transporting the product through several frontiers and selling it to wholesalers and smaller distributors.

There are competing views of how drug markets are organised. Most studies assume that organised crime plays a major role in structuring these markets through organisations that are hierarchical, relatively permanent and bureaucratic. Some authors posit the existence of 'corporations' in the drug trade. In parallel, there are explanations in which 'violence is typically regarded as the principal regulator of competition' (Morselli, 2001). This model does not seem to apply to our data. It appears that hashish dealers face few barriers to entry in the low and middle levels of the market, and also in the higher levels if they have the right contacts and funds. A successful operation does not require the creation of a large or enduring organisation, and it is possible to function as a high-level dealer without recourse to violence (Reuter and Haaga, 1989). Moreover, violence and intimidation do not have as much of a presence in the European hashish trade as in the cocaine business. There are cases concerning kidnappings and killings in our sample, but they are rare and usually connected with rip-offs, fights at the retail level or reactions against enforcement officers.

Regarding the origin of the agents of this market, Moroccan hashish importers both compete and cooperate with native Spanish and other European importers, and to a lesser extent with traffickers of other nationalities, which is similar to what Zaitch (2002) has recently found concerning Colombian importers in the Netherlands. All traffickers experience conditions that both promote and limit their opportunities. While some Moroccans may have privileged access to hashish supply, local entrepreneurs tend to have better access to human resources and infrastructure in their countries.

Prices, standardisation of products and economies of scale

Price data are a potentially important research tool for understanding the workings of drug markets and the effects of law enforcement (Caulkins and Reuter, 1998), but its collection has not been a priority in Europe. Thus, we lack historical data on such a crucial variable, which makes it difficult to understand the evolution of drug markets. With regard to cannabis resin and other cannabis products, European evidence shows a clear decrease in real prices, at least from 1989 to 2004, a period in which there has been a clear increase in demand of cannabis products. This appears to have also happened in other European countries, such as the UK. It seems that international groups which operate in a European common market for cannabis have developed economies of scale, with declining costs per unit of output, and this has resulted in a decrease of prices, the standardisation of supply, and a reduction in the diversity of the final product both in quality, origin and type of derivative.

Bibliography

- Adler, P. A. (1985), *Wheeling and dealing. An ethnography of an upper-level drug dealing and smuggling community*, Columbia University Press, New York.
- Bowcott, O. (2003), 'Morocco losing forests to cannabis', *The Guardian*, 16 December.
- Caulkins, J. P., Reuter, P. (1998), 'What price data tell us about drug markets', *Journal of Drug Issues* 28(3): 593–612.
- De Kort, M., Korf, D. (1992), 'The development of drug trade and drug control in the Netherlands: a historical perspective', *Crime, Law and Social Change* 17: 123–144.
- Dorn, N., Murji, K., South, N. (1992), *Traffickers. Drug markets and law enforcement*, Routledge, London.
- EMCDDA (2006), *Annual report 2006*, European Monitoring Centre for Drugs and Drug Addiction, Lisbon.
- EMCDDA (2007), *Annual report 2007*, European Monitoring Centre for Drugs and Drug Addiction, Lisbon.
- Franzosi, R. (1987), 'The press as a source of socio-historical data: issues in the methodology of data collection from newspapers', *Historical Methods* 20 (1): 5–16.
- Franzosi, R. (1995), *The puzzle of strikes: class and state strategies in postwar Italy*, Cambridge University Press, Cambridge.
- Gamella, J. F., Jiménez Rodrigo, M. L. (2003), *El consumo prolongado de cánnabis: pautas, tendencias y consecuencias*, Fundación de Ayuda contra la Drogadicción, Madrid.
- Gamella, J. F., Jiménez Rodrigo, M. L. (2004), 'A brief history of cannabis policies in Spain', *Journal of Drug Issues* 34(3): 623–659.
- Haller, M. H. (1990), 'Illegal enterprise: a theoretical and historical interpretation', *Criminology* 28(2): 207–235.
- Independent Drug Monitoring Unit (2005), 'The cannabis market', *Drug survey 2005* www.idmu.co.uk/ru5.htm
- Ketterer, J. (2001), 'Networks of discontent in Northern Morocco: drugs, opposition and urban unrest', *Middle East Report Online* 218, special issue: *Morocco in transition* www.merip.org/mer/mer218/mer218.html
- Kielbowicz, R. B., Scherer, C. (1986), 'The role of the press in the dynamics of social movements', *Research in Social Movements, Conflict and Change* 7: 203–233.
- King, L. A., Carpentier, C., Griffiths, P. (2004), 'An overview of cannabis potency in Europe', *Insights* No. 6, European Monitoring Centre for Drugs and Drug Addiction, Lisbon.
- Kingery, P. M., Alford, A. A., Coggeshall, M. B. (1999), 'Marijuana use among youth — epidemiological evidence from the US and other nations', *School Psychology International* 20 (1): 9–21.
- Korf, D. J., Verbraeck, H. (1993), *Dealers en dienders: dynamiek tussen drugsbestrijding en de midden- en hogere niveaus van de cannabis, cocaine, amfetamine en ecstasyhandel in Amsterdam*, Criminologisch Instituut Bongers, Universiteit van Amsterdam, Amsterdam.
- Labrousse, A., Romero, Ll. (2001), *Rapport sur la situation du cannabis dans Le Rif Marocain*. OFDT, Paris.
- MacCoun, R. J., Reuter, P. (2001), *Drug war heresies: learning from other vices, times and places*, Cambridge University Press, Cambridge.
- Moore, M. H. (1977), *Buy and bust. The effective regulation of an illicit market in heroin*, Heath, Lexington.
- Morselli, C. (2001), 'Structuring Mr. Nice. Entrepreneurial opportunities and brokerage positioning in the cannabis trade', *Crime, Law and Social Change* 35: 203–244.
- Natarajan, M., Belanger, M. (1998), 'Varieties of drug trafficking organisations: a typology of cases prosecuted in New York City' *Journal of Drug Issues* 28 (4): 1005–1025.

- Observatoire Géopolitique des Drogues (OGD) (1996), *Atlas mondial des drogues*, Presses Universitaires de France, Paris.
- Observatorio Español sobre Drogas (2003), *Informe número 6, Noviembre 2003*, Ministerio del Interior. Delegación del Gobierno para el Plan Nacional sobre Drogas, Madrid.
- Olzak, S. (1989), 'Analysis of events in studies of collective action', *Annual Review of Sociology* 15: 119–141.
- Olzak, S. (1992), *The dynamics of ethnic competition and conflict*, Stanford University Press, Stanford.
- Reuter, P. (1984), *Disorganized crime: illegal markets and the mafia*, MIT Press, Cambridge.
- Reuter, P. (1985), 'Eternal hope: America's quest for narcotics control', *The Public Interest* 79 (Spring): 79–95.
- Reuter, P., Haaga, J. (1989), *The organisation of high-level drug markets: an exploratory study*, Rand Corporation, Santa Monica.
- Reuter, P., Kleinman, A. R. (1986), 'Risk and prices: an economic analysis of drug enforcement', *Crime and Justice, An Annual Review of Research* 7: 289–340, Chicago University Press, Chicago.
- Reuter, P., MacCoun, R., Murphy, P. (1990), *Money from crime. A study of the economics of drug dealing in Washington, D.C.*, RAND Drug Policy and Research Center, Santa Monica.
- Ruggiero, V., South, N. (1995), *Eurodrugs. Drug use, markets and trafficking in Europe*, University College London Press, London.
- Tilly, C., Tilly, L., Tilly, R. (1975), *The Rebellious Century, 1830–1930*, Harvard University Press, Cambridge.
- UNODC (2003), *Global illicit drug trends 2003*, United Nations Office on Drugs and Crime, Vienna.
- UNODC (2004), *World drug report 2004*, United Nations Office on Drugs and Crime, Vienna.
- UNODC (2005), *World drug report 2005*, United Nations Office on Drugs and Crime, Vienna.
- UNODC (2006), *World drug report 2006*, United Nations Office on Drugs and Crime, Vienna.
- UNODC (2007), *World drug report 2007*, United Nations Office on Drugs and Crime, Vienna.
- Wagstaff, A. (1989), 'Economic aspects of illicit drug markets and drug enforcement policies', *British Journal of Addiction* 84 (10): 1173–1182.
- Wilkinson, I. (2003), 'Morocco: cannabis profits "funding terrorism"', *Daily Telegraph*, 9 August.
- Zaitch, D. (2002), *Trafficking cocaine: Colombian drug entrepreneurs in the Netherlands*, Kluwer Law International, The Hague.

Chapter 16

An analysis of the significance of supply and market factors for variations in European cannabis use

Keywords: cannabis – seizures – supply – market modelling – trafficking

Setting the context

The chapter by Carpentier et al. (this monograph) discussed the broad concept of ‘availability’ as applied to the cannabis market in Europe. The chapters by Ballotta et al., Korf and Asmussen also suggest that governments across Europe are placing emphasis upon the stronger enforcement of the supply of cannabis. Despite this, our understanding of the cannabis market remains limited, as does our understanding of how variations in supply-side factors may influence demand. This short chapter provides a postscript to the previous chapter by Gamella and Jiménez Rodrigo on Moroccan cannabis resin, by describing an innovative approach to modelling the cannabis resin market. It analyses some recent initiatives that may increase our knowledge of supply-side factors, and discusses some differences between the markets for cannabis and those for other illicit drugs, in particular heroin and cocaine.

While correlations can be identified, there remains considerable work to be done in the area of mapping availability. It may prove useful to identify whether there are any regional correlations between prevalence and resin seizures, and to determine any cross-border patterns that are linked to supply lines.

Further reading

- Ben Lakhdar, C. (2007), *Le trafic de cannabis en France: Estimation des gains des dealers afin d’apprécier le potentiel de blanchiment*, OFDT, Paris.
- Boekhout van Solinge, T. (2004), ‘Dealing with drugs in Europe. An investigation of European drug control experiences: France, the Netherlands and Sweden’, Final draft PhD, Amsterdam.
- Decorte, T., Tuteleers, P. (2007), *Cannabisteelt in Vlaanderen*, Acco, Leuven.
- Duffy, M., Schafer, N., Coomber, R., O’Connell, L., Turnbull, P. (2008), *Cannabis supply and young people*, Joseph Rowntree Foundation, York.

- Edmunds, M., Hough, M., Urquia, N. (1996), *Tackling local drug markets*, Police Research Group. Home Office, London.
- MacCoun, R., Reuter, P. (2001), *Drug war heresies. Learning from other vices, times and places*, Cambridge University Press, Cambridge.
- van der Heijden, T. (2004), 'Estimating consumption and production of cannabis', presentation at EMCDDA Cannabis Supply reduction meeting, Lisbon, 29 November 2004, European Monitoring Centre for Drugs and Drug Addiction, Lisbon.

An analysis of the significance of supply and market factors for variations in European cannabis use

Leif Lenke

Introduction

Various studies have noted that national cannabis policies, be they liberal or repressive, do not show a constant impact on demand (Reuband, 1998; Korf, 2002). It is therefore important to explore other factors that may contribute to the different patterns of cannabis use we find in Europe today. This chapter takes as its basis a co-authored study of heroin supply factors and market conditions, on which the author worked for the Council of Europe (Lenke and Olsson, 1998).

Developing a supply model for illicit psychoactive substances

The analysis for the Council of Europe study was based on a number of assumptions. These include:

- the geographical distribution of seizures is not random;
- some correlation exists between heroin consumption and distribution;
- the accumulation of large amounts of heroin at distribution points is generally avoided;
- the seizure of large consignments of narcotics is given priority, irrespective of the type of drug policy pursued; and
- a positive correlation would be expected over the longer term between quantities seized and quantities distributed.

The study suggested that it was possible to show a strong positive correlation for western Europe whereby increases in the amount of heroin seizures in a given country tended to be followed by an immediate increase in consumption, as measured by some indirect indicators, including fatal overdoses. Moreover, this model allowed conclusions to be drawn about the impact on these indicators of changes in the supply situation.

The development of a seizures-based model for analysing cannabis markets may not be as straightforward as that for heroin. The cannabis market is much broader than that

for heroin, and the profile of consumers more mixed. Further to this, important changes may be occurring in the nature of the European cannabis market. The long-term domination in many countries of Moroccan-produced resin trafficked through Spain is now called into question by data suggesting increases in home-grown or domestically cultivated herbal cannabis. This trend is likely to have shortened the distance between product source and consumer, and the extent to which cannabis is trafficked across borders. Nonetheless, cannabis resin still accounts for the bulk of the cannabis that is seized in Europe (Pietschmann and Legget, this monograph) and the analysis presented here focuses solely on resin and is therefore partial by definition.

In the Council of Europe heroin case study it was possible to show that the supply of heroin was a central factor for understanding consumption patterns. For example, proximity of different countries to the Balkan route was important: countries along the route had particularly serious heroin problems, while those at a greater distance, for example the Scandinavian countries, had been to some extent shielded. As cannabis resin consumed in Europe is largely produced in North Africa and imported via the Iberian peninsula, it is possible to explore the extent to which geographical proximity to resin trafficking routes is reflected in cannabis consumption indicators.

If the quantity of cannabis seized in proportion to the population size is analysed, it is possible to identify differences between countries, with those countries in Europe that have close contacts with Morocco tending to report larger seizures. For this purpose, 'close contact' refers not only to geographical proximity, but also social proximity resulting from colonialism and migration. This has been referred to in the American literature as 'pipelines', with reference to the Colombian involvement in the American cocaine market (Reuter and Kleiman, 1986). For the purposes of this exploratory analysis, each country has been allocated an 'exposure score', which was found to have a strong positive correlation (approaching $r = 0.90$) with the population-adjusted seizure total. Spain was excluded from the analysis as it was an extreme outlier due to its atypically high values for both seizures and cannabis consumption.

Important differences exist between the organisation of the cannabis market and that of other drugs. Among these is the involvement of a large number of actors, lack of clear hierarchy, and relative ease in which new operations can be established (see Gamella and Jiménez Rodrigo, this monograph). Profits can be substantial and relatively low investment is required to establish new operations. This low degree of organisation and the absence of a monopoly may manifest itself in relatively low and stable prices found for cannabis resin (see Carpentier et al., this monograph). However, again a geographical effect is apparent: prices reported in Norway and Iceland are over four times higher than those found in Spain and Portugal, for example.

Another important difference in the structural organisation of the cannabis market, as opposed to some other drug types, is that its operations tend to be European based, often involving nationals from or with good contacts in the target market. This means that trafficking networks have 'natural' contacts with the local distribution networks. This has often been a problem for the distributors on the heroin market where 'outsiders' can face difficulties in selling consignments of drugs directly on the local markets, and success is dependent on having reliable contacts with networks in both the production or trans-shipment country and the country of consumption.

How does drug supply impact on the consumption of cannabis?

In order to explore the question of how drug supply impacts on consumption an indicator of the extent of current or recent cannabis use is required. Methods to access the size and nature of the cannabis market are described elsewhere in this monograph (Vicente et al.). For the purposes of the exploratory analysis presented here, a good proxy measure, even if it is somewhat partial, is provided by the ESPAD data set (see Hibell et al., this monograph). The advantage of ESPAD is that it is conducted in a systematic fashion and guarantees anonymity to the participants and thus the level of comparability can be regarded as relatively high. The disadvantage is that the data is only available for 15–16 year-old students and patterns of use in the broader population may differ. However, as changes in deviant behaviour tend to manifest themselves earlier among the youngest age groups (Carlsson, 1972) this group may provide a useful window on changes in overall consumption patterns.

The result is that a clear — although not particularly strong — positive statistical correlation exists between last-month prevalence from the ESPAD studies and seizures. For 16 west European countries, the strength of the correlation lies at $r = 0.56$ ($F = 6.02$). Given the uncertainties involved in the measure of supply in particular (i.e. quantities seized), this can be interpreted as providing support for the hypothesis on the significance of supply for cannabis consumption.

The correlation between the supply of cannabis and 'recent use' is relatively strong among students; in countries with high prevalence, the quantities of cannabis seized are also high. Spain has again been excluded from the analysis as an extreme outlier. It is not as easy to comment on the correlation between quantities seized and recent use over time. This is due in large part to the absence of robust and comparable time series in which contrasts can be made. However, a general impression that emerges from the data that are available does suggest a relationship between seizures and consumption. It can be noted that the most substantial increases in cannabis use appear to have

occurred during the first half of the 1990s (UNODC, 2004). This was also the period that saw the greatest increases in the production of cannabis in Morocco and also the greatest increases in the quantities seized in Spain (Gamella and Jiménez Rodrigo, this monograph).

Concluding remarks

To summarise, the correlations reported here support the conclusion that a relationship exists between indicators of cannabis supply and the extent of cannabis use in western Europe. This factor has relevance for the discussion on the significance of drug policy choices in influencing the extent and trends in cannabis use over time. As such, the analysis offered here, although preliminary, supports the conclusions made by Reuband (1998) and Korf (2002) that the 'level of repression' found in different national cannabis policies does not appear to be a consistent central factor for explaining the variations found in the epidemiological data on cannabis consumption patterns.

That said, in the context of a discussion on the factors that do determine national variations in levels of cannabis use, it is not helpful to simply shift the point of focus from drug policy to drug supply. Clearly other factors are also likely to be important. The structure of the correlations provides little if any support for the contention that cannabis use is determined by demand at the macro level, however.

One factor that is often presented as an explanation of variations in cannabis use is that the drug is associated with specific cultural patterns, and in particular with specific patterns of youth subculture. These subcultural patterns arguably then determine the patterns of demand and consumption. Testing a hypothesis of this kind is difficult, although some types of drug consumption, at some periods of time, do appear to be closely linked with particular subcultural groups, for example ecstasy (MDMA) was associated with the emergence of rave culture in Europe. Linking today's widespread patterns of cannabis use to any specific subcultural group would appear, however, more problematic. A more reasonable interpretation of the relationships is that the supply of, and access to, drugs contributes to and intensifies the establishment of consumption behaviours. Such a relationship is exemplified by, for example, the drinking cultures described in the field of alcohol research, which are also, at least in part, determined by supply-side factors.

Bibliography

Carlsson, G. (1972), 'Unga lagöverträdare. 2, Familj, skola och samhälle i belysning av officiella Data'; SOU-serie 1972:76. Del av 1956 års klientelundersökning rörande ungdomsbrottslingar. Statens Offentliga Utredningar (SOU), Stockholm.

- Danish National Police (2003), *Report on organised crime in Denmark 2002*, Copenhagen.
- EMCDDA (2003), *Annual report 2003*, European Monitoring Centre for Drugs and Drug Addiction, Lisbon.
- Korf, D. (2002), 'Dutch coffee shops and trends in cannabis use', *Addictive Behaviours* 27: 851–866.
- Lenke, L. and Olsson, B. (1998), *Heroin seizures as an indicator of variation in market situations, drugs availability and heroin use in Europe*, Report to the Pompidou Group, Council of Europe, Strasbourg.
- MacCoun, R. and Reuter, P. (1996), 'Evaluating alternative cannabis regimes', *British Journal of Psychiatry* 178: 123–128.
- Reuband, K-H. (1998) 'Drug policies and drug prevalence: the role of demand and supply', *European Journal of Criminal Policy and Research* 6: 321–336.
- Reuter, P. and Kleiman, M. (1986), 'Risk and prices: an economic analysis of drug enforcement', 289–339 in Tonry, M. and Morris, N. (eds), *Crime and Justice* 7, University of Chicago Press.
- UNODC (2004), *World drug report 2004*, United Nations Office on Drugs and Crime, Vienna.

Appendix: Grey literature list						
Year of publication and publisher	Title, author	Pages	General monograph	Targeted monograph (Subject)?	Journal special issue	Countries and language
1994 Australian Government	<i>Australian National Drug Strategy, Monograph No. 25 on The health and psychological consequences of cannabis use</i> (Hall, Solowik, Lemon, 1994).	198 (109 000 words)	✓	✓ Public health		Australia (EN)
1997 Lindsmith Center	<i>Marijuana myths, marijuana facts — a review of the scientific evidence</i> (Zimmer and Morgan, 1997)	241	✓			USA (EN)
1997 World Health Organisation	<i>Cannabis: A Health Perspective and Research Agenda</i> (WHO, 1997)	50	✓			Global — WHO (EN)
1997 UNODC Bulletin on Narcotics	<i>Bulletin on Narcotics 1997, Issue 1</i>		✓		✓ Bulletin on Narcotics, 1997 Issue 1	Global (EN)
1998 House of Lords Science and Technology Committee	<i>Cannabis, HL Paper 151</i> (UK Government Stationery Office, 1998)	306	✓			United Kingdom (EN)
1999 Toronto: Addiction Research Foundation	<i>The Health Effects of Cannabis</i> (Kalant, Corrigan, Hall, Smart (eds.), 1999)	526		✓ Public health		Canada (EN)
1999 Swiss Federal Commission for Drug Issues (EKDF)	<i>Cannabis Report</i> (Swiss Federal Commission for Drug Issues (EKDF), 1999)	91	✓			Switzerland (EN)
1999 Institute of Medicine	<i>Marijuana and Medicine: Assessing the Science Base</i> (Joy et al. (eds.), 1999)	288	✓			USA (EN)

1999	Comunidad de Madrid (Spain)	Cannabis: <i>¿hasta dónde!</i> (Cabrera Forneiro, J. and Ramos Atance, J. (eds)., 1999), Comunidad de Madrid/Harcourt	230	✓		Spain (ES)
2000	BISDR0 Institute for Drug Research, University of Bremen	Drug Dependence: Risk and Monitoring (DDRAM) Final Report: Comparative Study Between Newcastle, Groningen, Bremen, Rome and Dublin	21		✓ Adolescent cannabis use	Germany (EN)
2000	UK Department of Transport	Cannabis and driving: a review of the literature and commentary (UK Department of Transport, 2000)	94		✓ Road safety	United Kingdom (EN)
2000	Plan Nacional Sobre Drogas (Spain)	Monografía Cannabis (Bobes García and Calafat Far, 2000)	330	✓	✓ Addicciones	Spain (ES)
2001	Australian Government	The Health and Psychological Effects of Cannabis – 2nd edition, National Drug Strategy, Monograph No. 44 (Hall, Degenhardt, Lynskey, 2001)	182	✓	✓ Public health	Australia (EN)
2001	National Commission on Ganja (Jamaica)	A report of the national commission on ganja to Rt. Hon. P. J. Patterson, QC, MP, Prime Minister of Jamaica (Chevannes et al., National Commission on Ganja, 2001)	25 000 words	✓		Jamaica (EN)
2001	Inserm (France)	Cannabis: Quels effets sur le comportement et la santé ?, Synthèse et recommandations (Inserm, 2001)	58		✓ Public health	France (FR)
2001	British Journal of Psychiatry	British Journal of Psychiatry 178 (2), February 2001	28		✓ Health; pharmacology; mental health; legislation	United Kingdom (EN)

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Year of publication and publisher	Title, author	Pages	General monograph	Targeted monograph (Subject)?	Journal special issue	Countries and language
2002 Joseph Rowntree Foundation	<i>Times they are a-changing: the policing of cannabis</i> (May, Warburton, Turnbull, Hough, 2002)	74	✓	✓ Policing (UK)		United Kingdom (EN)
2002 NIDA (USA)	<i>Nida Notes: Articles on Marijuana Research</i> (NIDA (ed.), 2002)	64	✓			USA (EN)
2002 Canadian Senate Special Committee On Illegal Drugs	<i>Cannabis: our position for a Canadian public policy</i> (Nolin et al., 2002)	843 (5 sections)	✓	✓ Legislation (Canada)		Canada (EN, FR)
2002 Canadian Senate Special Committee On Illegal Drugs	<i>Physiological and psychological effects of cannabis: review of the research findings</i> (Wheelock, 2002)	52		✓ Public health		✓ Canada (EN)
2002 Belgian Ministry of Public Health	<i>The Cannabis 2002 report. Joint international effort at the initiative of the ministers of public health of Belgium, France, Germany, The Netherlands, Switzerland</i> (Spruit et al., Belgian Ministry of Public Health, 2002)	142	✓	✓ Public health		Belgium, France, Germany, The Netherlands, Switzerland (EN)
2002 Association GT national – médecine générale et conduites addictives (France)	<i>Quand le cannabis fait problème: la question des vulnérabilités</i> (Association GT national, 2002)	140		✓ Public health	✓ Actes XV — Colloque Nationale: La Rochelle, Novembre 2002	France (FR)

2002	Scottish Executive Effective Interventions Unit	<i>Drug treatment among young people: a systematic review of effectiveness and the legal framework</i> (Elliott et al., 2002)	135	✓	Treatment (adolescent focus)	United Kingdom (EN)
2002	Sociedad Española De Investigación Sobre Cannabinoides'	<i>Guía Básica sobre los Cannabinoides</i> (2002)	160	✓	Cannabinoids	Spain (ES)
2002	Advisory Council On The Misuse Of Drugs, UK Home Office	<i>The classification of cannabis under the Misuse of Drugs Act 1971</i>	22	✓	Legislation (UK focus)	United Kingdom (EN)
2003	Trimbos Institute	<i>Cannabis: Feiten en cijfers 2003</i> (Rigter, van Laar, Rigter, Kilmer, 2003)	61	✓		The Netherlands (NL)
2003	RAND Europe, on behalf of the Dutch Ministry of Health, Welfare and Sports	<i>Cannabis: Policy, Implementation and Outcomes</i> (van het Loo et al., 2003)	92	✓	Legislation (EU focus)	The Netherlands (EN)
2003	Rowntree Foundation	<i>A growing market, the domestic cultivation of cannabis</i> (Hough et al., 2003)	60	✓	Home-produced herbal cannabis	United Kingdom (EN)
2003	Swedish National Drug Policy Coordinator	<i>Is Cannabis a Harmless Drug?</i> (Swedish National Drug Policy Coordinator, 2003)	32	✓	Legislation; public health	Sweden (EN)
2003	Asociación Española de Estudio en Drogodependencias (AESED)	<i>Monográfico Cannabis — Revista Española de Drogodependencias Vol. 30, no. 1–2</i> (AESED, 2003)	> 218	✓	✓ Revista Española de Drogodependencias	Spain (ES)

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Year of publication and publisher	Title, author	Pages	General monograph	Targeted monograph (Subject)?	Journal special issue	Countries and language
2003 Ministro del Interior (Spain)	Folleto Cannabis (Ministro del Interior, 2003)	36	✓	✓ Citizen advice		Spain (ES)
2003 Association Pistes	SWAPS — Spéciale Cannabis 32/33 (Plaloux ed., 2003)		✓		✓ SWAPS	France (FR)
2003 ONDCP (USA)	Marijuana: Myths and Facts (ONDCP, 2003)	44	✓			USA (EN)
2003 Institute for Social Drug Research, University of Ghent (BE)	Cannabis in Vlaanderen. Patronen van cannabisgebruik bij ervaren gebruikers (Cannabis in Flanders: Patterns of cannabis consumption in experienced users.) (Decorte, Muys, Stock, 2003)		✓	✓ Long-term use of cannabis		Belgium (Flanders) (NL)
2003 New Zealand House of Representatives, Health Committee	<i>Inquiry into the public health strategies related to cannabis use and the most appropriate legal status. Report of the Health Committee</i> (Chadwick (ed.), 2003)	80		✓ Public health		New Zealand (EN)
2004 Advisory Council On The Misuse Of Drugs, UK Home Office	<i>Further consideration of the classification of cannabis under the Misuse of Drugs Act 1971</i>	36		✓ Legislation (UK focus)		United Kingdom (EN)
2004 Toxibase and Crips	<i>L'usage problématique de cannabis</i> (Hautefeuille (ed.), 2004)	84		✓ Public health		France (FR)

2004 BZgA, Germany	Schule und cannabis, Regeln, Maßnahmen, Frühintervention (BZgA, 2004)	36	✓ Cannabis in schools	Germany (DE)
2004 OFSP (Switzerland)	Ecole et cannabis. Règles, mesures et détection précoce (Office fédérale de la santé publique, 2004)	38	✓ Cannabis in schools	Switzerland (FR)
2004 JSP/Center for the Study of Law and Society, University of California, Berkeley	What Does It Mean to Decriminalize Marijuana? A Cross-National Empirical Examination (Facula et al., 2004)	34	✓ Decriminalisation (focus on Australia, Germany, Portugal, The Netherlands, USA)	USA (EN)
2004 National Institute of Public Health (Sweden)	Adverse Health Consequences of Cannabis Use: (Ramström, 2004)	130	✓ Public health	Sweden (EN)
2004 Fraser Institute	Marijuana Growth in British Columbia (Easton, 2004)	40	✓ Cannabis policy; economics (British Columbia focus)	Canada (EN)
2004 EMCDDA	Insights: An overview of cannabis potency in Europe (EMCDDA, 2004)	72	✓ Cannabis potency	European Union (EN)
2004 Grupo de Estudios sobre el Cannabis	Informe Sobre el Cannabis 2004: Análisis de situación y propuestas de actuación	32	✓ Drug policy	Spain (ES)

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Year of publication and publisher	Title, author	Pages	General monograph	Targeted monograph (Subject)?	Journal special issue	Countries and language
2004 EMCDDA	<i>Regular and intensive use of cannabis and related problems: conceptual framework and data analysis in the EU member states</i> (Simon, 2003)	45	✓	Public health (EU focus)		European Union (EN)
2004 Bundesministerium für Gesundheit und soziale Sicherung	<i>Cannabisbezogene Störungen: Umfang, Behandlungsbedarf und Behandlungsangebot (Cannabis related disorders (CareD): Prevalence, Service needs and Treatment provision)</i> (Simon and Sonntag, 2004)	172	✓	Cannabis treatment (Germany)		Germany (DE)
2004 <i>Drogues, santé et société</i>	<i>Cannabis</i> (Ben Amar (ed.), 2004)		✓		✓ <i>Drogues, santé et société</i> , Vol. 2, No. 2	Canada (FR)
2004 Österreichischen Gesellschaft für Psychiatrie und Psychotherapie (ÖGPP)	<i>State of Art-Paper der zum Thema: 'Cannabis'</i> (Haller and Dittrich, 2004)	34	✓	(some focus on mental health and somatic effects)		Austria (DE)
2004 EMCDDA	<i>Cannabis problems in context: understanding the increase in European treatment demands, Annual Report 2004 Selected Issue</i> (EMCDDA, 2004)	8		✓ Public health (EU focus)		European Union (Official EU languages)
2004 National Advisory Council on Drugs, Ireland	<i>An Overview of Scientific and other Information on Cannabis</i> (Morgan (ed.), 2004).	133	✓			Ireland (EN)

2004	Deutsche Hauptstelle für Suchtfragen e.V.	Cannabis: Basisinformationen (Merfort-Dieter, 2004)	48	✓		Germany (DE)
2005	Criminologisch Instituut Bongier, Universiteit van Amsterdam	Cannabis zonder Coffeeshop niet-gedoopte cannabisverkoop in tien Nederlandse gemeenten (Korf et al., 2005)	145	✓	Policy, policing; coffee shops in Netherlands	The Netherlands (NL)
2005	Rodin Foundation	Le Cannabis: Document de Travail	221	✓	Includes chapters on Belgium, USA, Canada, Australia, Spain, Morocco, The Netherlands, France, Germany, Sweden, Switzerland, United Kingdom, Italy	Belgium (FR)
2006	PNSD (Spain)	Informe sobre cannabis (Comisión clínica de la delegación del gobierno para el Plan Nacional Sobre Drogas, 2006)	78	✓		Spain (ES)
2006	OFDT (France)	'Consultations cannabis' — Enquête sur les personnes accueillies en 2005 (Obradovic, 2006)	109	✓	France, epidemiology	France (FR)
2006	Ordre National des Pharmaciens	Synthèses: Le Cannabis (Karila and Reynaud, 2006) www.ordre.pharmaciens.fr/upload/Syntheses/197.pdf	6	✓	✓ Tendances No. 50	France (FR)

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Year of publication and publisher	Title, author	Pages	General monograph	Targeted monograph (Subject)?	Journal special issue	Countries and language
2006 UNODC	UNODC World Drugs Report 2006, Chapter 2: Why should we care about cannabis? (Leggett et al., 2006)	51	✓	✓ Public health; trafficking		Global (EN)
2006 INPES	Repérage précoce de l'usage nocif de Cannabis (INPES, 2006)	4	✓			France (FR)
2006 Beckley Foundation Drug Policy Programme	Cannabis and mental health: responses to the emerging evidence (Hunt, Lenton and Witton, 2006)	16	✓	✓ Mental health		United Kingdom (EN)
2006 Société Française d'Alcoologie	Alcoologie et Addictologie, Juin 2006	111	✓	✓ History (France); adolescent use	✓ Alcoologie et Addictologie 2006; 28 (2): 93-204	France (FR)
2006 Mental Health Council of Australia	Where there's smoke ... cannabis and mental health (Mental Health Council of Australia, 2006)	76	✓	✓ Mental health		Australia (EN)
2006 Australian National Council on Drugs	Cannabis: answers to your questions (Copeland et al., 2006)	23	✓			Australia (EN)
2006 Australian National Council on Drugs	Evidence-based answers to cannabis questions: a review of the literature (Copeland, 2006)	89	✓			Australia (EN)
2006 Australian Ministerial Council on Drug Strategy	National Cannabis Strategy 2006-2009	40	✓	✓ Government policy		Australia (EN)

2006	Informe Sobre Cannabis (Ministerio de Sanidad e de Consumo, 2006)	78	✓	✓	Public health (Spain)	Spain (ES)
2006	Comisión Clínica de la Delegación del Gobierno para el Plan Nacional Sobre Drogas					
2006	The Evidence Base for the Classification of Drugs (Levitt, Nason and Hallsworth, 2006)	86	✓	✓	Legislation	Europe (United Kingdom) (EN)
2007	RAND Corporation					
2007	EMCDDA drugs profiles: Cannabis	6	✓			Europe (EN)
2007	EMCDDA					
2007	Cannabis Explained: Frank Action	19	✓			United Kingdom (EN)
2007	Talk to Frank Campaign (UK)					
2007	Update (UK Home Office, 2007)					
2007	Parliament of Australia, Social Policy Section					
2007	Does cannabis use lead to mental-health problems?: findings from the research (Buckmaster and Thomas, 2007)	7	✓	✓	Mental health	Australia (EN)
2007	OFDT (France)					
2007	Cannabis, données essentielles, Saint-Denis, (Costes, J.-M. (ed.) OFDT, 2007)	232	✓			France (FR)
2007	Instituut voor Social Drugsonderzoek					
2007	Cannabiskwekers in vlaanderen. Patronen en motieven van 748 telers (Decorte, T. and Tuteleers, P., 2007)	268		✓	Homegrow	Belgium (NL)
2007	Joseph Rowntree Foundation					
2007	The impact of heavy cannabis use on young people (Melrose, M. (ed.), Joseph Rowntree Foundation 2007)	92		✓	Mental health	United Kingdom (EN)

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Year of publication and publisher	Title, author	Pages	General monograph	Targeted monograph (Subject)?	Journal special issue	Countries and language
2007 Sociedad Española de investigación en cannabinoid (SEIC)	<i>Aspectos psiquiátricos del consumo del cannabis</i> (Ramos Atance, J. (ed.))	189		✓ Mental health		Spain (ES)
2007 Home Office (UK)	<i>The illicit drug market in the United Kingdom, Home Office Online Report 20/07</i> (Matrix research group, 2007)	101		✓ Trafficking; economic analysis		United Kingdom (EN)
2007 OFDT (France)	<i>Le trafic de cannabis en France</i> (Ben Lakhdar, C., OFDT, 2007)	25		✓ Trafficking; economic analysis		France (FR)

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