

No. 2011-126

**THE LONG AND WINDING ROAD TO CANNABIS
LEGALIZATION**

By

Jan C. van Ours

November 2011

ISSN 0924-7815

The long and winding road to cannabis legalization

Jan C. van Ours*

November 29, 2011

Abstract

In almost all countries supply, distribution and use of cannabis is prohibited. Nevertheless, cannabis is the most popular illicit drug. Prohibition does not seem to work. The debate on legalization of cannabis is often emotional with strong views of both proponents and opponents but ignorance prevails. There are supposedly detrimental health effects of cannabis use but researchers debate whether they are causal or mere associations. As long as nowhere in the world cannabis is legalized it is difficult to get a clear idea about the effects of legalization. Rather than muddling through for several decades it would be wise to start moving on the long and winding road to cannabis legalization.

JEL Classification: I18, KI42

Keywords: Cannabis use, Effects of use, cannabis legalization.

This paper is an extended version of Van Ours (2012), which comments on Caulkins et al. (2012).

*Department of Economics, CentER, Tilburg University, The Netherlands; Department of Economics, University of Melbourne, Parkville, Australia; CEPR (London), CESifo (Munich); vanours@uvt.nl.

1 Introduction

Although some countries have quasi-legalized cannabis use (the Netherlands), made cannabis available for medical purposes (California) or allowed the growing of a small number of cannabis plants for personal use (Australia), in most countries (the Netherlands included) cannabis supply, distribution and use is prohibited (Reuter, 2010). Nevertheless, in 2009, between 2.8% and 4.5% of the world population aged 15-64, corresponding to between 125 and 203 million people had used cannabis at least once in the past year (United Nations Office on Drugs and Crime, 2011).

Table 1 presents cannabis use statistics for a number of countries, distinguishing between lifetime use (ever), recent use (last year) and current use (last month). The range in lifetime use is substantial from a low 21% in Sweden to a high 42% in the United States. The range in recent cannabis use is also substantial from a low 1% in Sweden to a high 14% in Italy. Finally, current use ranges from 1% in Sweden to 7% in Spain and the United States. What is also striking is the big difference between lifetime use and recent use. In the Netherlands for example 25% of the population aged 15 to 64 has ever used cannabis but only 7% has done so in the last year. Apparently, for a substantial part of the users, cannabis is not very addictive (see also Van Ours, 2006 for details).

Clearly, prohibition does not work. Cannabis is the most popular illicit drug. The debate on legalization of cannabis gains momentum. Caulkins et al. (2011) mention seven motivations for creating a legal cannabis market: raising tax revenues, eliminating arrests, undercutting black markets and associated harms from corruption and violence, redirecting criminal justice resources, assuring product quality, increasing choices for those seeking intoxication and limiting youth access by better control. The legalization debate is often emotional with strong views of both proponents and opponents. Those who are in favor of legalization tend to ignore the negative health effects of cannabis use. Those who are against legalization ignore the fact that legal substances such as alcohol and tobacco also have bad health effects (Hall and Lynskey, 2009).

The current paper discusses empirical evidence on cannabis use, the

health effects of cannabis use and the implication for legalization of cannabis use. The paper is set-up as follows. Section 2 gives an overview of the legalization debate. Section 3 presents the main characteristics of cannabis policy in the Netherlands. Section 4 discusses characteristics of cannabis use, while section 5 deals with effects of cannabis use on its users. Section 6 concludes.

2 Legalization debate

There is no direct empirical evidence of the effects of legalization of cannabis on its use or its users. The evidence is indirect and based on out of sample predictions.

2.1 Theoretical models

The legalization of cannabis has been studied in a few theoretical papers. Becker et al. (2006) present a model which assumes full competition and thus zero expected profits. The fact that some drugs suppliers make huge profits has to do with the ex post position that they were not caught. Becker et al. show that under some conditions law enforcement aiming at quantity reduction is inferior to a policy regime under which drugs are legalized and taxed. They argue against Glaeser and Shleifer (2001) who claim that quantity reductions are easier to implement than price increases through tax, because illegal activities are easier to detect than not paying taxes. The argument by Becker et al. is that enforcement costs may be very high. An interesting argument of Becker et al. is also that with inelastic demand for drugs, more enforcement reduces consumption but increases drug revenues implies that more resources are available for drug smuggling. Poret (2003) presents a multi-layer model of the drugs market with traffickers, retailers, dealers and consumers. He considers the drugs market to be an oligopoly and shows that under some conditions an increase in law enforcement may reduce consumer prices.¹

¹This might occur for example when traffickers internalize the increased risk retailers run by reducing the wholesale price.

2.2 California Proposition 19

According to Kilmer et al. (2010) California has always been on the cutting edge of cannabis policy reform. In 1975, California reduced the maximum sentence for possessing less than an ounce (28.35 grams) of cannabis from incarceration to a small fine. In 1996, California allowed cannabis to be grown and consumed for medical purposes. California currently has over a thousand medical marijuana shops. In November 2010 California voted on whether cannabis should be legalized and taxed. The Californian proposition on the 2010 ballot – the Regulate, Control, and Tax Cannabis Act, also known as Proposition 19 – would have fully legalized cannabis with respect to the Californian state law.²

Pacula (2010) argues that the debate on cannabis legalization in California is dominated by worries about health consequences as one-fifth of all treatment admissions in the state is due to marijuana use. An increase in cannabis use may also cause an increase in health expenditures which will be paid through taxes. So a priori it is not clear that there will be a net tax reduction when cannabis is legalized. However, she concludes that it is unlikely that a rise in the known health harms would lead to a large enough cost to taxpayers to off-set the revenue gain from legalizing and taxing – assuming that taxes are actually paid and not evaded. Kilmer et al. (2010) provide estimates of the possible effects of legalizing cannabis in California. Taking into account that their estimates have unknown confidence intervals they find that pretax retail price of cannabis will go down a lot, likely by more than 80 percent. The effect on consumer prices will depend on taxes but it is likely that consumption will go up. Tax revenues will increase but it is virtually impossible to indicate by how much. The savings on enforcing cannabis laws are also difficult to indicate. Caulkins et al. (2012) take Proposition 19 as their inspiration to discuss legalization design choices: the level of taxes and whether taxes should depend on cannabinoid levels, rules on home cultivation, advertising restrictions and design adjustments over time. The legalization design choices Caulkins et al. (2012) discuss are im-

²It would not have prevented federal prohibition action. In theory, federal agents can take over low-level enforcement but in practice federal prosecutors would probably only deal with large quantities of cannabis.

portant. Taxes should be sufficiently high to discourage cannabis use and sufficiently low to drive out illegal supply. Furthermore, taxes should depend on cannabinoid levels, home cultivation should be allowed under restrictions and advertising should be banned. The most important design choice of legalization is the flexibility to adjustment, allowing for learning by doing.

Proposition 19 was narrowly rejected with 53.5% of the voters voting against the proposal.

3 The Dutch example

The Netherlands have a cannabis policy that is closest to being legal although cannabis supply and distribution are prohibited and in fact also use is not legal but decriminalized. The main aim of Dutch drug policy is to protect the health of individual users, the people around them and society as a whole. Regulations on drugs are laid down in the Opium Act, which draws a distinction between hard drugs and soft drugs. Hard drugs are those substances which can seriously harm the health of the user and include heroin, cocaine and synthetic drugs such as ecstasy. Soft drugs, i.e. the cannabis derivatives, marijuana and hashish cause far fewer health problems. The possession of hard drugs is a crime. However, since 1976 the possession of a small quantity of soft drugs for personal use is a minor offense.

The expediency principle is applied to the sale of cannabis in “coffee-shops” in order to separate the users’ market for hard and soft drugs and keep young people who experiment with cannabis away from hard drugs. The sale of small quantities of soft drugs in coffee-shops is therefore technically an offense, but prosecution proceedings are only instituted if the operator or owner of the shop does not meet certain criteria. These criteria are that no more than 5 grams per person may be sold in any one transaction, no hard drugs may be sold, drugs may not be advertised, the coffee-shop must not cause any nuisance, no drugs may be sold to persons under the age of 18, which may not be admitted to the premises. The mayor may order a coffee-shop to be closed.

By allowing controlled use of soft drugs, the markets for soft drugs and hard drugs are separated. The idea is that strict prohibition of soft drugs

would stimulate the black market and lead soft drugs users into hard drug use. So, controlled use avoids soft drugs to become a stepping-stone for hard drugs. According to MacCoun (2011) the Dutch coffeeshop system may have been responsible for separating the soft and hard drug markets and rather than increasing the gateway from soft to hard drug use may have reduced this gateway (see also Van Ours, 2003). According to Reuter (2010) commercialization of sale in the Netherlands may have led to an increase in consumption but the increased access has not led to the Dutch population showing higher than average rates of cannabis use or longer cannabis use careers. Korf (2002) indicates that the use of cannabis in the Netherlands shows trends that are very similar to those in other European countries that did not decriminalize cannabis.

Coffeeshops were absent until the middle of the 1970s. Then their number increased rapidly to reach a maximum of about 1500 across the Netherlands in the early 1990s. In the past decade the number of coffeeshops went down. The evolution of the number of coffeeshops in the Netherlands is presented in Figure 1. As shown, in the past decade the number of coffeeshops has declined substantially. In the four big cities (Amsterdam, Rotterdam, Utrecht and The Hague) the drop from 2000 to 2009 was 74, in the rest of the Netherlands 73 coffeeshops ceased to exist. In 2009 in 101 of the Dutch municipalities out of the total of 441 municipalities there were one or more coffeeshops.

The reduction of the number of coffeeshops has to do with closings near schools and a more strict policy against coffeeshops that did not stick to the rules and regulations. In Amsterdam for example the number of coffeeshops went down with 58 from 283 in 2000 to 225 in 2009. In some municipalities close to the border all coffeeshops were closed to avoid “drug tourism” from Belgium, France and Germany, i.e. to ban foreign customers who buy cannabis in the Netherlands and take this across the border. According to Wouters, Benschop and Korf (2010) there is a shift in policy from a health perspective to a law-and-order perspective. They find that the presence of coffeeshops in a municipality is more likely in large municipalities and municipalities with a left-wing local government while the number of coffeeshops in a municipality is mainly determined by its population size.

Because supply and distribution is still prohibited cannabis policy in the Netherlands is in a twilight zone. Recently, measures have been implemented to reduce access to coffeeshops. The plan is to transform the coffeeshops to clubs for which one needs a permit to enter. The main idea of these permits is that they will prevent tourists from entering, thus making coffeeshops local shops for local people.

4 Nature of cannabis use

4.1 Dynamics

Cannabis is different from regular consumption goods. The use of cannabis is widespread but many individuals only use for a short period. Others use it on a regular basis but are still recreational users for whom cannabis use is comparable to drinking a beer every now and then. The nature and variation in cannabis use are determined by the dynamics of cannabis use. The decision to start using a particular drug may be driven by experimentation. If individuals do not have information about their addictive nature the only way to learn about it is to experiment with drugs (Orphanides and Zervos, 1995). In deciding to do so, individuals balance the instant pleasure derived from experimentation with drugs against the probabilistic disutility that they may get addicted to the drug. If individuals find out too late that they have an addictive personality with respect to a particular drug they will stay on. Alternatively, initiation of drug use may be driven by curiosity which could explain the high quit rate which is often observed right after the initiation.

Figure 2 shows typical patterns in the dynamics of cannabis use derived from a sample of Amsterdam cannabis users (Van Ours, 2006). The top-left graph shows that some youngsters start using cannabis between age 15 and 25, with clear peaks at age 16, 18 and 20. If they have not done so before age 25 they are very unlikely to do this later on in life. The top-right graph shows the cumulative starting probability, which increases between age 15 and 25 to almost stay flat at later ages at a level between 50 and 60 percent. The bottom-left graph shows that about 20 percent of the cannabis users stop

using within a year after they started. The bottom-right graph shows that many consumers stop using after a couple of years, but even 20 years after they started between 30 and 40 percent are still using cannabis.³ Based on these dynamics three groups of individuals can be distinguished, abstainers, experimentalists and persistent users some of whom are recreational users while others are addicts.

4.2 Price sensitivity

When considering price effects of legalization, the dynamics of cannabis use are also important. It is difficult to predict what will happen if such an unprecedented policy change as legalization of cannabis is introduced. Legalization will affect cannabis use mainly - though not exclusively - through the change in price which in itself will depend on one of the legalization design choices, the level of taxes. However, there is hardly any study on the relationship between cannabis price and dynamics in use. A study based on Australian data shows that a lower price lowers the age of initiation but has no effect on the duration of cannabis use (Van Ours and Williams, 2007). It is also not immediately clear how the intensity of cannabis use will change. It could be that a price drop only affects the extensive margin, i.e. attracts casual users without increasing frequent use. It could also be that a price reduction does not affect the overall use but does affect the frequent use. The effects of a cannabis price drop are likely to be strongest for youngsters.

For the purpose of illustration Figure 3 shows the association between cannabis price and cannabis use of American youngsters over the period 1991-2007. In the period 1991 to 1997 there was a drop in real cannabis prices in the U.S. of almost 60% while between 1997 and 2007 the cannabis price increased with 150%. These price fluctuations were accompanied by changes in ever use between 30 and 45% and changes in last 30 days use between 15 to 25%. Although the plots in Figure 3 cannot be interpreted as causal they do suggest that both intensive and extensive margin of cannabis use will be affected by legalization.

The price effects of legalization are unclear. Pacula (2010) argues that

³The patterns in Figure 2 are not typical for the Amsterdam but can be found in other countries too.

legalization might cause a drop in cannabis price of 75 percent. Although this is a lot it is within the range of actual price changes in the U.S. in the past decades. The price drop caused by legalization would mean no more than a return to mid-1990s prices. Nevertheless, both extensive and intensive margin of cannabis use seem to be affected.

5 Health effects of cannabis use

People mainly worry about the health effects of cannabis use.⁴ Nevertheless, in the grand scheme of risky health behaviors cannabis use has a modest contribution (Cawley and Ruhm, 2011).

From a meta-analysis, Degenhardt et al. (2003) conclude that there seems to be a modest but significant association between heavy use of cannabis and later depression. In their overview study, Arseneault et al. (2004) conclude that rates of cannabis use are approximately twice as high among people with schizophrenia as among the general population. Hall and Degenhardt (2009) argue that previous research on the relationship between mental health and illicit substance use, comes almost entirely from epidemiology. The results from this research are mixed, with some papers reporting a positive association between cannabis use and mental health problems and others reporting no association. Discussing a variety of papers Werb et al. (2010) conclude that the research to date is insufficient to conclusively claim that the association between cannabis use and psychosis is causal in nature.

In examining the relationship between mental health and cannabis use, the literature cited above has attempted to identify the causal effect of cannabis use by controlling for observed factors that may be a source of confounding. However, as noted by Pudney (2010), the potential for unobserved common confounding factors makes inference regarding the causal impact of cannabis use difficult. Nevertheless, recent evidence suggests that there is a negative causal effect of cannabis use on health (Van Ours and

⁴Other worries concern the relationship between cannabis use and crime. Little is known but the cannabis induced crime by users seems to be limited. Organized crime is heavily involved in supplying cannabis use. Furthermore, there is a discussion about whether cannabis use induces the use of hard drugs. This stepping stone effect seems to be absent or small (Van Ours, 2003).

Williams, 2011a and 2011b).

All of the linkages to assess the health effects of legalization have one element in common: uncertainty. Therefore, opinions of individuals who have had personal experience with cannabis use may be helpful. From an analysis of Australian data it appears that past cannabis users are more in favor of legalization than non-users. Apparently for individuals with personal experience the personal benefits of legalization are more important than the personal costs (Williams et al. 2011).

6 Discussion

Caulkins et al. (2011) argue that prohibition of rarely used substances is easier to implement than prohibition of widely used drugs. This also applies in reverse. Legalization of a frequently used drug such as cannabis will have smaller effects on use than legalizing a less frequently used drug such as cocaine. The discussion about legalization of cannabis is hampered because even simple effects are not clear in terms of their magnitude. Most likely cannabis prices will go down and cannabis use will go up. But whether this will induce negative health effects depends on whether the increase in use will be at the intensive margin as well as the extensive margin. Criminal activities, predominantly those by suppliers, will be reduced. Whether legalization benefits outweigh legalization cost will also depend on design choices.

There are many relationships about which researchers are uncertain, debating whether they are causal or mere associations. As long as nowhere in the world cannabis is legalized it is difficult to get any clear idea about the consequences of legalization (Pudney, 2010). Removing the veil of ignorance that surrounds the legalization debate requires a lot of additional research effort. However, researchers rarely agree and even if they would agree it is doubtful whether that would convince politicians to go ahead with cannabis legalization. Doing further research and hoping that an evidence based cannabis policy will emerge is wishful thinking. Rather than muddling through for several decades it would be wise to start moving on the long and winding road to cannabis legalization.

The health effects of cannabis use should not be ignored. Clearly, it is healthier not to use cannabis at all. Nevertheless, the health effects should not be exaggerated either. If alcohol use and smoking cigarettes are accepted albeit under restrictions so should cannabis use be. There are clear advantages of legalization. Legalization would make life more comfortable for cannabis users, remove criminal organizations from the scene, allow for the possibility of quality control, provide governments with tax revenues and make it possible for researchers to collect empirical evidence. In short, it is time for politicians to walk down the legalization road “to boldly go where no man has gone before”.

References

- Arseneault L., Cannon M., Witton J. and Murray R.M. (2004) Causal association between cannabis and psychosis: examination of the evidence, *British Journal of Psychiatry*, 184, 110-117.
- Becker G.S., Murphy K.M. and Grossman M. (2006) The market for illegal goods: the case of drugs, *Journal of Political Economy*, 114, 38–60.
- Bieleman B. and N. Nijkamp (2010) *Coffeeshops in Nederland 2009*, Intraval, Rotterdam.
- Caulkins J.P., Reuter P. and Coulson C. (2011) Basing drug scheduling decisions on scientific ranking of harmfulness: false promise from false premises, *Addiction*, 106, 1886–1890.
- Caulkins J.P., Kilmer B., MacCoun R.J., Pacula R.L. and Reuter P. (2012) Design considerations for legalizing cannabis: Lessons inspired by analysis of California’s proposition 19, *Addiction*, 106, forthcoming.
- Cawley J. and Ruhm C. (2011) The economics of risky health behaviors, *NBER Working Paper* 17081.
- Degenhardt L, Hall W. and Lynskey M. (2003) Exploring the association between cannabis use and depression, *Addiction*, 98, 1493-1504.
- Glaser E.L. and Shleifer A. (2001) A reason for quantity regulation, *American Economic Review*, Papers and Proceedings, 91, 431–435.
- Fries A., Anthony R.W., Cseko A., Gaither C.C. and Schulman E. (2008) The price and purity of illicit drugs: 1981-2007, *Institute for Defense Analyses Paper* P-4369.
- Hall W. and Degenhardt L. (2009) The adverse health effects of non-medical cannabis use, *Lancet*, 374, 1383–1391.

- Hall W. and Lynskey M. (2009) The challenges in developing a rational cannabis policy, *Current Opinion in Psychiatry*, 22, 258–262.
- Kilmer B., Caulkins J.P., Pacula R.L., MacCoun R.J. and Reuter P.H. (2010) Altered State? *Occasional Paper Rand*.
- Korf D.J. (2002) Dutch coffee shops and trends in cannabis use, *Addictive Behaviors*, 27, 851–866.
- MacCoun R.J. (2011) What can we learn from the Dutch cannabis coffeeshop system? *Addiction*, 106, 1899–1910.
- Orphanides A. and Zervos D. (1995) Rational addiction with learning and regret, *Journal of Political Economy*, 103, 739–758.
- Pacula R.L. (2010) Examining the impact of marijuana legalization on harms associated with marijuana use, *RAND Working Paper WR-769-RC*.
- Poret, S. (2003) Paradoxical effects of law enforcement policies: the case of the illicit drug market, *International Review of Law and Economics*, 22, 465–493.
- Pudney S. (2010) Drugs policy - what should we do about cannabis? *Economic Policy*, 2010, 61, 165–211.
- Reuter P. (2010) Marijuana legalization: what can be learned from other countries? *RAND Working Paper WR-771-RC*.
- United Nations Office on Drugs and Crime (2011) *World Drugs Report*, United Nations, New York.
- Van Laar M.W. (2011) *Nationale Drug Monitor*, Trimbos-Instituut, Utrecht.
- Van Ours J.C. (2003) Is cannabis a stepping-stone for cocaine? *Journal of Health Economics*, 22, 539–554.
- Van Ours J.C. (2006) Dynamics in the use of drugs, *Health Economics*, 15, 1283–1294.
- Van Ours J.C. (2012) The long and winding road to cannabis legalization, *Addiction*, forthcoming.
- Van Ours J.C. and Williams J. (2007) Cannabis prices and dynamics of cannabis use, *Journal of Health Economics*, 26, 578–596.
- Van Ours J.C. and Williams J. (2011a) Cannabis use and mental health problems. *Journal of Applied Econometrics*, 26, 1137–1156.
- Van Ours J.C. and Williams J. (2011b) The effects of cannabis use on physical and mental health, *CEPR Discussion paper 8499*.
- Werb, D., Fischer B. and Wood E. (2010) Cannabis policy: time to move beyond the psychosis debate, *International Journal of Drug Policy*, 21, 261–264.
- Williams J., Van Ours J.C. and Grossman. M. (2011) Why do some people want to legalize cannabis use? *NBER Working paper 11-07*.
- Wouters M., Benschop A. and Korf D.J. (2010) Local politics and retail cannabis markets: the case of Dutch coffeeshops, *International Journal of Drug Policy*, 21, 315–320.

Table 1: Cannabis use; various countries (percentages)

Country	Year	Population (age)	Ever use	Last year use	Last month use
Australia	2007	≥ 14	34	9	5
Denmark	2008	16-64	39	6	2
England & Wales	2008-09	16-59	31	8	5
France	2005	15-64	31	9	5
Germany	2006	18-64	23	5	2
Italy	2008	15-64	32	14	7
Netherlands	2009	15-64	26	7	4
Spain	2007-08	15-64	27	10	7
Sweden	2008	15-64	21	1	1
United States	2009	≥ 12	42	11	7

Source: Van Laar (2011)

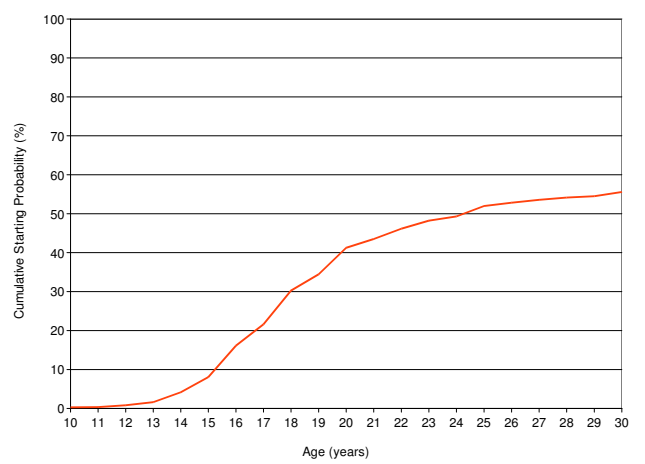
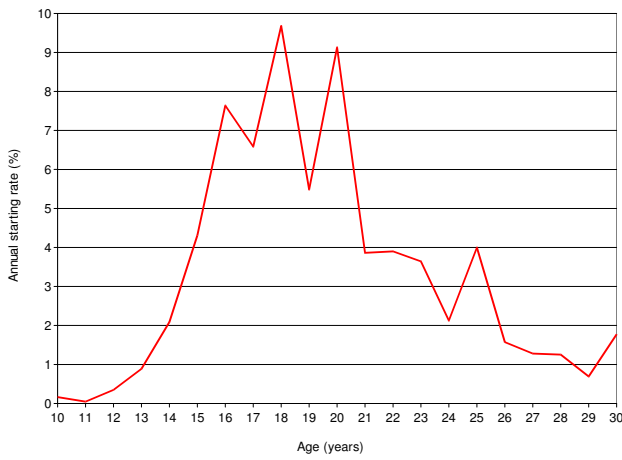
Figure 1: Coffeeshops in the Netherlands; 4 big cities and the rest of the Netherlands; 2000–2009



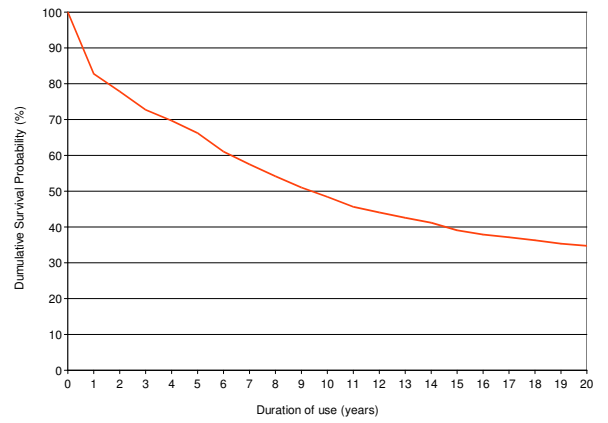
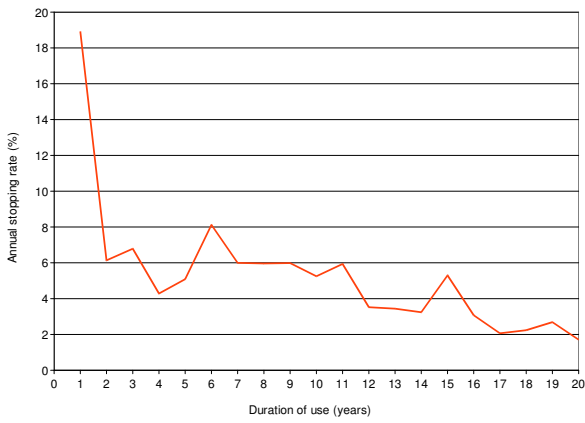
Source: Bieleman and Nijkamp (2010)

Figure 2: Dynamics in cannabis use in Amsterdam

a. Starting rates by age



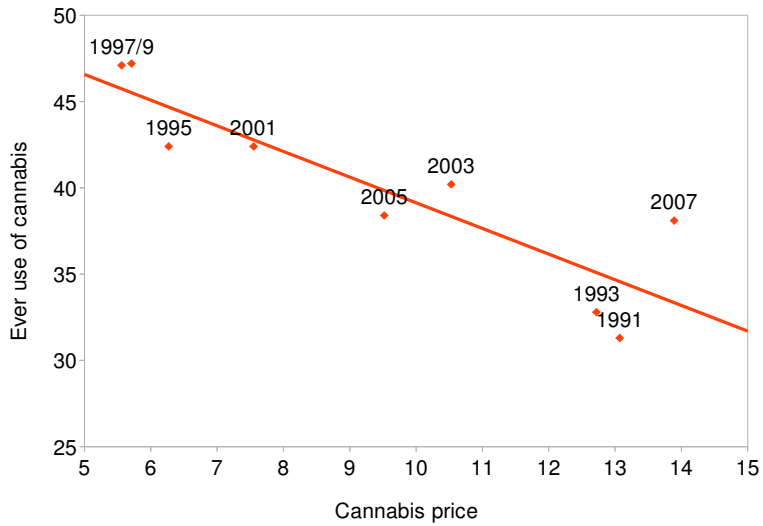
b. Quit rates by duration of use



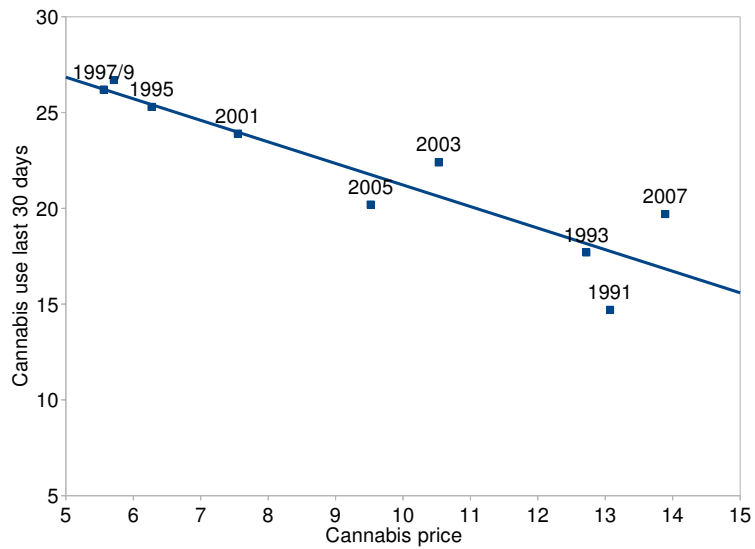
Source: Van Ours (2006) – based on surveys in 1994, 1997 and 2001.

Figure 3: The association between cannabis prices and cannabis use of youngsters; United States, 1991–2007

a. Ever use of cannabis



b. Cannabis use last 30 days



Source: Cannabis use among 9th to 12th graders: Youth Risk Behavior Survey; median cannabis price in constant 2007 dollars per gram for small quantities (less than 10 grams): Fries et al. (2008).