AMERICAN ACADEMY OF PEDIATRICS

TECHNICAL REPORT

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Legalization of Marijuana: Potential Impact on Youth

ABSTRACT. This technical report provides historical perspectives and comparisons of various approaches to the legal status of marijuana to aid in forming public policy. Information on the impact that decriminalization and legalization of marijuana could have on adolescents, in addition to concerns surrounding medicinal use of marijuana, are also addressed in this report. Recommendations are included in the accompanying policy statement. *Pediatrics* 2004;113:e632–e638. URL: http://www.pediatrics.org/cgi/content/full/113/6/e632; *marijuana, legalization, substance abuse, decriminalization.*

ABBREVIATIONS. AAP, American Academy of Pediatrics; IOM, Institute of Medicine.

BACKGROUND

Over the last 40 years, the legal status of marijuana has been debated vigorously. Proponents of policies that would permit individual possession of small amounts of marijuana argue that it is a safe drug and that criminal sanctions against personal use and possession represent at worst excessively harsh and at best unnecessary penalties. Echoing these sentiments, editors of *The Lancet* have concluded that "cannabis per se is not a hazard to society but driving it further underground may well be."[1] Advocates for legalization also point out that the morbidity, mortality, and economic costs to society associated with alcohol and tobacco use in the United States dwarf those associated with marijuana use.

Those opposing liberalization of current laws counter that marijuana is not a benign drug, especially in light of new psychopharmacologic information demonstrating that marijuana shares many features with other illicit drugs. They also contend that legalization or decriminalization of personal use of marijuana likely would trigger a substantial increase in use, with foreseeable increases in the social, economic, and health costs.

Most recently, the debate has focused on the medical use of marijuana (that is, the use of smoked marijuana to treat a variety of medical conditions). Eight states (Alaska, Arizona, California, Colorado, Maine, Nevada, Oregon, and Washington) have passed ballot initiatives that provide for medical use of marijuana under certain circumstances; one other state (Hawaii) has enacted state legislation permitting medical marijuana use.[2] The federal government has opposed vigorously any efforts to permit physicians to prescribe marijuana for medical purposes, an approach characterized by the former editor of the *New England Journal of Medicine* as "misguided, heavy-handed, and inhumane."[3]

Controversy regarding marijuana is not limited to the United States. Australia has decriminalized the use of marijuana in some territories, and Canada[4] as well as Switzerland and other European countries[5] are reconsidering their approach to marijuana. However, the most widely publicized approach to regulation of marijuana is that of The Netherlands. Under a complex system of "law-on-the-books" and "law-in-action," Dutch law permits personal use of marijuana but outlaws possession.[6]

Pediatricians, too, are not of one mind in their views regarding the legal status of marijuana. In a periodic survey of fellows of the American Academy of Pediatrics (AAP) conducted in 1995,[7] only a minority (18%) favored legalization, and 26% believed that possession or sale should be a felony; 31% felt that marijuana should be available by prescription for medical purposes to a certain class of patients, and 24% believed that marijuana should remain illegal but penalties for personal possession should be reduced or eliminated.

Since the periodic survey was conducted, much more has been learned about the psychopharmacologic properties of marijuana. Scientists have demonstrated that the emotional stress caused by withdrawal from marijuana is linked to corticotropin-releasing factor, the same brain chemical that has been linked to anxiety and stress during opiate, alcohol, and cocaine withdrawal.[8] Others report that tetrahydrocannabinol, the active ingredient in marijuana, stimulates release of dopamine in the mesolimbic area of the brain, the same neurochemical process that reinforces dependence on other addictive drugs.[9] Current scientific information about marijuana has been summarized in the AAP policy statement "Marijuana: A Continuing Concern for Pediatricians."[10] Some of the significant neuropharmacologic, cognitive, behavioral, and somatic consequences of acute and long-term marijuana use are well known and include negative effects on short-

The guidance in this report does not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

term memory, concentration, attention span, motivation, and problem solving, which clearly interfere with learning; adverse effects on coordination, judgment, reaction time, and tracking ability, which contribute substantially to unintentional deaths and injuries among adolescents (especially those associated with motor vehicles); and negative health effects with repeated use similar to effects seen with smoking tobacco. Three recent studies[11–13] demonstrate an association between marijuana use and the subsequent development of mental health problems; however, a small study of 56 monozygotic cotwins discordant for marijuana use did not find any such associations.[14]

DEFINITION OF TERMS

There are 3 general policy perspectives concerning the status of marijuana in the United States: prohibition, decriminalization, and legalization. Prohibition describes current federal policy toward marijuana use, which seeks to minimize or prevent use of marijuana with strong legal sanctions and aggressive interdiction of supply routes. Decriminalization and depenalization (used interchangeably in this report) refer to the elimination, reduction, and/or nonenforcement of penalties for the sale, purchase, or possession of marijuana although such activities remain illegal. Under decriminalization, penalties for use or distribution are at least possible theoretically, and advertising would be banned. Legalization, one step beyond decriminalization, would fundamentally change the status of marijuana in society. It is an acknowledgment that the government has no fundamental interest in an individual's use of a drug, although it may still seek to regulate its sale, distribution, use, and advertisement to safeguard the public's health. Such is the case with alcohol and tobacco. Of the 3 approaches, only the prohibitionist approach has reducing or limiting drug use as its explicit goal.

HISTORICAL PERSPECTIVES ON DRUG POLICIES IN THE UNITED STATES

Important perspectives on how changing the status of marijuana could affect use by adolescents can be gleaned from an examination of this country's experience with drugs over the last 200 years. During the 19th century, opiate drugs were legal and widely available. Opium use was common, especially among middle-class white women.[15] Use of morphine also was extensive, and heroin was marketed as a "sedative for coughs." Cocaine, which routinely was added to patent medicines and beverages, also was legal; it was prized for its local anesthetic effect and its ability to counteract the effects of morphine. The national opiate addiction rate increased from 0.72 per 1000 in 1840 to 4.59 per 1000 in the 1890s, thereafter beginning a sustained decline.[16(p28)]

Another wave of drug use began in the mid-1960s as enforcement of marijuana laws by police became lax and adolescent and layperson perceptions of the risk of regular use declined. Officials from the US Drug Enforcement Agency expressed the view that the fight against marijuana detracted from the more important work of combating heroin use.[16(p174)] Drug incarcerations per 1000 arrests began to drop in 1960 and remained low through 1979. The Carter administration (1977–1981) proposed removing criminal sanctions for possessing small amounts of marijuana.[16(p175)] In 1975, 6% of high school seniors reported using marijuana daily during the previous 30 days. By 1978, the same year during which perceived risk of regular use of marijuana reached its lowest point ever, 10.7% of high school seniors reported using the drug daily.[17]

Drug use in America tends to follow cycles, often with one generation having to relearn the experiences of previous ones. Ninety years after the first cocaine epidemic, cocaine use began to increase in the 1970s and escalated substantially from 1980 to 1995. Because it had been so long since the previous epidemic, cocaine was perceived to be a safe drug. In a chapter on cocaine in the 1980 edition of a prominent textbook of psychiatry, the authors wrote: "If it is used no more than two or three times a week, cocaine creates no serious problems."[18] In 1977, 10% of 18- to 25-year-olds had used cocaine; that proportion doubled to 20% in 1979. By 1985, one third of 18- to 25-year-olds had used cocaine, as had 17.3% of 12th graders.[15] Only with subsequent widespread publicity about the health risks and addictive properties of cocaine and the epidemic of crack cocaine did cocaine use among young people begin to wane.

US AND INTERNATIONAL EXPERIENCES WITH MARIJUANA LEGALIZATION AND DEPENALIZATION

Because to our knowledge no country has completely legalized the sale, possession, and advertising of marijuana, there are no studies that examine the effect of legalization on marijuana use by young people. Hence, we examine data on adolescents' use of marijuana in states and countries that have, to a greater or lesser extent, decriminalized use and possession of this drug.

Analyzing data from the annual Monitoring the Future survey, Johnston et al[19] concluded that decriminalization of marijuana in a number of states from 1975 to 1980 apparently had no effect on high school students' beliefs and attitudes about marijuana or on their use of the drug during those years. In contrast, Chaloupka et al,[20] analyzing data from the 1992–1994 Monitoring the Future surveys, found that "youths living in decriminalized states are significantly more likely to report currently using marijuana and may consume more frequently."

There are several possible explanations for these disparate findings. Although the study by Johnston et al did not find any effect of decriminalization, baseline marijuana use was higher in states that changed their laws compared with states that did not, although the subsequent rate of increase in all states was the same. It is possible that the higher baseline rates of use in the states that decriminalized marijuana use may have reflected a more lax or tolerant approach to marijuana use before decriminalization. Hence, decriminalization would not have resulted in any significant lessening of enforcement,

and the observed rate of increase would parallel but not exceed changes in the states that did not alter their laws. Also, because the Monitoring the Future survey is administered in schools, any effect of decriminalization on marijuana use by out-of-school youth (who typically have higher levels of drug use[21]) would not have been reflected.

An additional explanation is provided by a recent analysis of marijuana decriminalization laws in the United States by Pacula et al.[22] They found that some states that are viewed as having decriminalized marijuana use have in fact retained a first-time marijuana offense as a criminal offense. In addition, many states that are characterized as not having decriminalized laws pertaining to marijuana use specify first-time marijuana possession offenses as noncriminal. These same authors found that youth living in states that lowered offenses for marijuana possession to below the felony level were more likely to report use of marijuana in the past month.[22]

Several territories in Australia have decriminalized use of marijuana. Studies comparing use in these territories with use in those that did not reduce penalties found no appreciable differences in use.[23,24]

The most widely scrutinized large-scale change in the legal status of marijuana occurred in The Netherlands. Dutch policy regarding decriminalization is very complex. Use of illegal drugs per se is not punishable by law, but possession for use is; drug dealing also is considered a felony.[25] Theoretically, one can be imprisoned for up to 1 month for possession of 5 g or less of cannabis, and promotion of marijuana through advertisements is forbidden also.

From 1984 to 1996, the period during which Dutch prosecution of marijuana-related offenses became virtually nonexistent, marijuana use increased consistently and substantially until 1992 while decreasing or remaining stable in other countries.[26,27] Among 18- to 20-year-olds, the proportion who reported ever having used marijuana increased from 15% to 44%, and the proportion who reported using it within the previous 30 days increased from 8.5% to 18.5%. Use among adolescents in the United States decreased steadily from 1979 to 1992. In Norway, which also forbids the sale of marijuana, use remained constant until 1992 and then increased. Use remained steady or decreased in Catalunya (Spain), Stockholm, Hamburg, and Denmark during this period. These figures strongly suggest that marijuana use was influenced by changes in Dutch policy during this period. However, the United States and Norway (Oslo) also experienced increases in use of marijuana from 1992 to 1996, and thus it is difficult to attribute any change in use among Dutch youth after 1992 to the country's drug policies.

The 1999 European School Survey Project on Alcohol and Drugs, specifically developed to provide data on European drug use comparable with that obtained by the Monitoring the Future surveys, revealed that the proportion of adolescents in The Netherlands who reported ever having used marijuana (28%) was substantially lower than that of 10th graders in the United States (41%). However, the European survey also indicated that Dutch use was higher than any other European country except Ireland, the United Kingdom, France, and the Czech Republic.[28]

MEDICAL MARIJUANA

Considerable anecdotal evidence suggests that marijuana may be effective in treating a number of medical conditions. This perspective has been an important force behind efforts to change the legal status of marijuana. Marijuana has been touted as ameliorating chemotherapy-induced nausea, wasting and anorexia associated with AIDS, intraocular pressure in glaucoma, and muscle spasticity arising from such conditions as multiple sclerosis. Two comprehensive reviews evaluating the scientific basis for these claims, one conducted by the Institute of Medicine (IOM) and the other by the American Medical Association, have been published recently.[29,30] Both reports acknowledge the lack of rigorous data to support the use of smoked marijuana as medicine while calling for additional research into the medical use of cannabinoids, especially those that could be delivered rapidly in a smoke-free manner. The IOM report noted that marijuana smoke delivers "harmful substances" as well as tetrahydrocannabinol to the body and that marijuana "plants cannot be expected to provide a precisely defined drug effect." "For these reasons," the IOM report concluded, "there is very little future in smoked marijuana as a medically approved medication. If there is any future in cannabinoid development, it lies with agents of more certain, not less certain, composition."

POTENTIAL EFFECT OF DECRIMINALIZATION OR LEGALIZATION ON US ADOLESCENTS

Although efforts to legalize marijuana are focused solely on adults (no one is proposing that use or possession of marijuana by adolescents should be legalized), any change in its legal status could nonetheless have an effect on adolescents. Alcohol (illegal for those under 21 years of age) and tobacco products (illegal under 18 years of age) are nonetheless the psychoactive substances most widely abused by adolescents. During 2003, 47.5% of 12th graders reported using alcohol in the past 30 days and 24.4% reported smoking cigarettes in the past 30 days.[31]

Legalization of marijuana could result in advertising campaigns for its use, some of which might be directed toward adolescents. Control measures to prevent advertising to young people, as recent experience demonstrates, may be difficult to implement. As revealed during the course of the Comprehensive Tobacco Settlement negotiations, tobacco companies systematically have marketed their products to young people even while disavowing any efforts to do so. Even after the Comprehensive Tobacco Settlement was implemented (which prohibited any youth-oriented advertising), tobacco companies continued marketing to young people. A recent study noted that cigarette advertising in youth-oriented magazines increased by $54 million after the Tobacco Master Settlement Agreement.[32] Another study showed that advertising of youth brands of ciga-

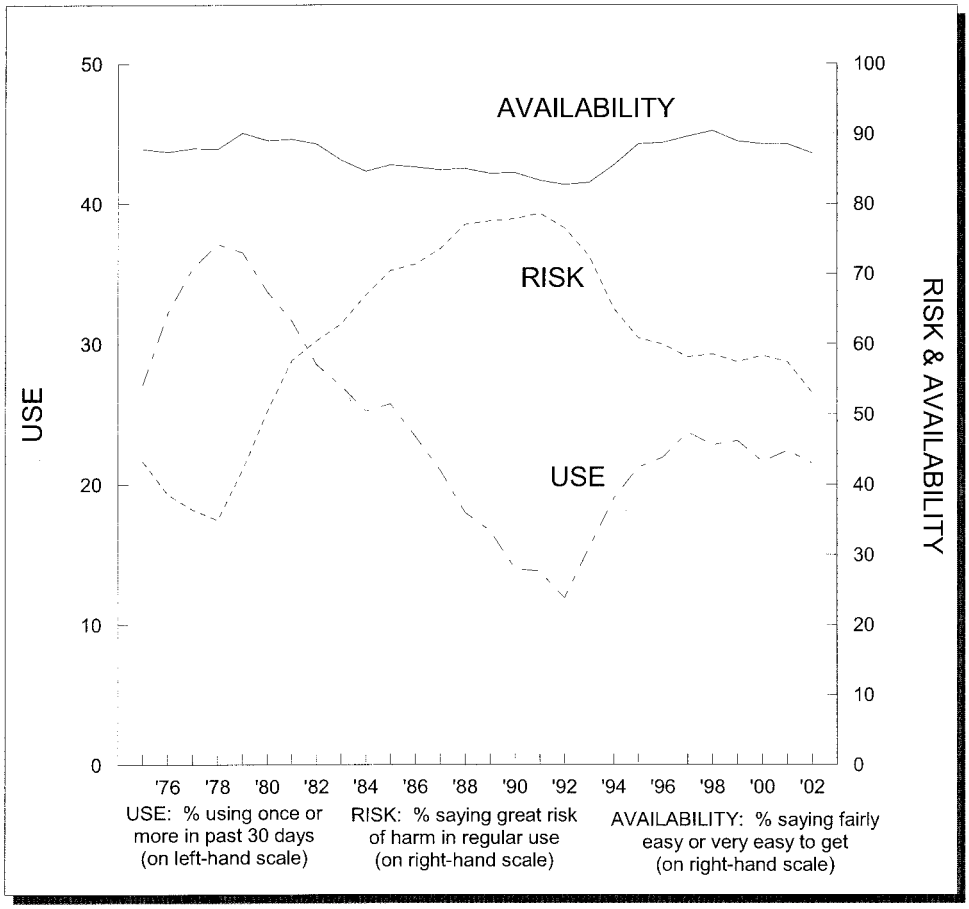
rettes (defined as those smoked by >5% of 8th, 10th, and 12th graders in 1998) in youth-oriented magazines increased from 1995 to 2000, as did expenditures for adult brands in youth-oriented magazines.[33] The Supreme Court recently struck down several Massachusetts regulations aimed at protecting schoolchildren from tobacco advertising (including bans on tobacco ads within 1000 feet of a school or playground). "The state's interest in preventing underage tobacco use is substantial and even compelling, but it is no less true that the sale and use of tobacco by adults is a legal activity," wrote Justice Sandra Day O'Connor for the majority. She continued, ". . . tobacco retailers and manufacturers have an interest in conveying truthful information about their products to adults, and adults have a corresponding interest in receiving truthful information about tobacco products."[34] Presumably, these same interests in regard to advertising for marijuana products also would be protected.

DiFranza[35] has demonstrated that both the states and the federal government are poorly enforcing the Synar Amendment, which requires states to control the sale of tobacco products to those younger than 18 years. Legalization of marijuana for adults but not adolescents would necessitate additional law enforcement burdens on a system that currently is not meeting its regulatory obligations.

Similarly, the alcoholic-beverage industry continues to portray drinking in terms that clearly appeal to young people. Drinking is associated with being sexy, popular, and fun and as an ideal means to "break the ice" in social settings.[36] These portrayals are extremely enticing to adolescents, who are in the process of developing their own identities as well as refining their social skills. One can speculate that distributors of marijuana quickly would recognize the profitability of portraying marijuana in a similar manner (thereby maximizing sales), all the while protesting that their marketing attempts seek only to induce adults to change brands.

How adolescents would perceive a change in the legal status of marijuana, even if only for adults, also is difficult to determine. However, recent studies have shown that prevalence of adolescent marijuana use is inversely proportional to the perceived risk associated with use (Fig 1).[37] The proportion of 12th graders who reported using marijuana in the past 30 days peaked in 1978 and again in 1997, exactly the years in which the perceived risk of regular use was at its lowest.

Some research suggests that legal sanctions may



Source: Johnston LD, O'Malley PM, Bachman JG. Monitoring the Future: National Survey Results on Drug Use, 1975-2002. Vol I: Secondary School Students. Bethesda, MD: National Institute on Drug Abuse; 2003

Fig 1. Marijuana: trends in perceived availability, perceived risk of regular use, and prevalence of use in past 30 days for 12th graders

influence the initial decision to use drugs and that this influence diminishes as drug use by individuals progresses.[38] If so, it is the youngest adolescents (those who have not yet tried marijuana or are in the experimentation phase) who would be affected most by changes in marijuana laws. Age at first use is, in turn, a risk factor for problem use in the future.[39]

Moral development in children and adolescents assumes a developmental trajectory. Early adolescents have a concrete approach to morality: laws are obeyed to avoid punishment. As such, young adolescents would be most susceptible to the deterrent effects of drug laws. This deterrent effect could disappear or lessen with legalization of marijuana. Once adolescents gain the ability to think abstractly, challenges to the apparent hypocrisy of "do as I say, not as I do" can be anticipated.

Parental drug use is an important influence on adolescents' drug use.[40] Recent data indicate that easy household access to illicit substances is associated with greater risk of marijuana use among both younger and older adolescents.[41] Some adults may choose not to use marijuana (however they may feel about the law), because the potential risk of criminal sanctions outweighs any perceived benefit from using the drug. With the demise of legal sanctions against use, some parents may choose to begin using marijuana, acting as an important new source of exposure for their adolescents. Parental use of marijuana in the last year is associated with their adolescent's use during the same period.[42]

Availability of marijuana, which might increase if the drug were legalized, clearly has been shown to affect adolescents' use. Adolescents who have been offered marijuana are 7 times more likely to use it than are those who have not been offered marijuana. Similarly, those who report that marijuana is easy to get are approximately 2.5 times more likely to use it than those who consider it hard to get.[43]

Marijuana is cheap and easy to produce; if it were legalized, its price likely would decrease below current levels. Work by Pacula et al[44] in the United States and Williams[45] in Australia demonstrates clearly that a decrease in the price of marijuana is associated with a significant increase in the prevalence of use among adolescents.

Some advocates for the legalization of marijuana argue that it is safer than alcohol. They suggest that increased use of marijuana by young people might have a positive effect if some adolescents switched from alcohol to marijuana (a substitution effect). This theory cannot be supported by recent studies on adolescent marijuana and alcohol use that incorporated the price of marijuana into the analysis. These studies conclude that an increase in use of marijuana by adolescents would result in an increased use of alcohol (ie, that the 2 drugs are economic complements).[46]

From a public health perspective, even a small increase in use, whether attributable to increased availability or decreased perception of risk, would have significant ramifications. For example, if only an additional 1% of 15- to 19-year-olds in the United States began using marijuana, there would be approximately 190 000 new users.[47]

COMPARISONS BETWEEN MARIJUANA, ALCOHOL, AND TOBACCO

Proponents of legalization of marijuana argue that in terms of costs to society, both financial and health-related, alcohol and tobacco cause far more harm than does marijuana. They argue that classifying a relatively benign drug (marijuana) as schedule I and vigorously prosecuting its sale and possession while permitting the legal use of substances that cause far more damage are inconsistent and illogical practices or policies. That alcohol and tobacco cause far more harm in our society than marijuana is undeniable, but it does not follow logically that yet a third addictive psychoactive drug (marijuana) should be legalized. Many of the harms associated with alcohol and tobacco use stem from the widespread acceptability, availability, and use of these substances. Still other harms result from lax enforcement of current laws regulating their use or sale, especially to underage youth. Rather than legalizing marijuana, an equally compelling approach would be vigorously enforcing current regulations regarding sale and use of alcohol and tobacco products to minimize health-related problems attributable to their consumption. Recent examples include lowering the blood alcohol concentration that defines whether an individual is driving while intoxicated to 0.08 mg/dL (0.02 mg/dL for youth), limiting or banning smoking in public places, and banning cigarette advertisements targeted toward young people.

SUMMARY

Several recent studies concerning American adolescents, the Dutch experience with decriminalization (from 1984 to 1992), and the relationship between cheaper marijuana and use by adolescents suggest that decriminalization increases marijuana use by adolescents. Because no country has legalized use of marijuana outright, there are no studies available to evaluate the potential effect of legalization in the United States. Legalization of marijuana could decrease adolescents' perceptions of the risk of use and increase their exposure to this drug. Furthermore, data concerning adolescents' use of the 2 drugs that are legal for adults (alcohol and tobacco) suggest strongly that legalization of marijuana would have a negative effect on youth. Alcohol and tobacco are the drugs most widely abused by adolescents, although their sale to adolescents (younger than 18 years for tobacco and younger than 21 years for alcohol) is illegal. Research demonstrates that manufacturers of alcohol and tobacco market their products to young people, and the recent Supreme Court decision and experience with the Synar Amendment suggest that, if marijuana were legalized, restrictions on the sale and advertising of the substance to young people would prove daunting. Finally, two in-depth reviews of medical marijuana conclude that future research should focus on the medical use of cannabinoids, not smoked marijuana.

Recommendations from the AAP are included in the accompanying policy statement.[48]

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