Institute For Behavior and Health
Creating Tomorrow's Drug Policy

Commentary

June 11, 2014

A Definitive Summary of the Adverse Effects of Marijuana Use: Implications for Public Policy

A definitive, comprehensive review of the current state of scientific knowledge on marijuana written by the nation's leading drug scientists has recently been published by the premier medical journal, *The New England Journal of Medicine.* Authored by the Director, Deputy Director, Associate Director for Scientific Affairs, and Health Scientist Administrator at the National Institute on Drug Abuse (NIDA), the article provides a clear, thorough analysis of the scientifically established adverse health effects of marijuana use.[1] This article is of historic importance and of great relevance for the current national debate over marijuana policy. Hopefully it will be useful in stemming the tide of a growing public misconception that marijuana is not an addictive drug and that marijuana use is not harmful. It is imperative that this summary of knowledge be shared widely and that specifically it be used to inform policy in the interest of public health and safety. The following is brief synopsis of the findings from Volkow, et al. (2014) as well as a policy context for these findings.

Marijuana is a drug of abuse that can produce addiction and withdrawal symptoms. About 9 percent of all marijuana users develop addiction to the drug;[2] this figure increases dramatically to 17 percent if marijuana use is initiated during adolescence and further increases to between 25 and 50 percent among daily marijuana users.[3] The adolescent brain is particularly vulnerable to marijuana because it is undergoing rapid development. The early and heavy use of marijuana increases the risk of addiction to marijuana and it also increases risk of use and addiction to other drugs.[4] Nearly 60% of Americans age 12 and older with a substance use disorder for drugs other than alcohol are dependent on marijuana, making it by far the most prevalent drug of abuse in the country.[5]

In addition to the link between early and heavy marijuana use and **addiction**, Volkow, et al. (2014) conclude that there is a strong association between marijuana use and **diminished lifetime achievement**; **motor vehicle crashes**; and **symptoms of chronic bronchitis**. Moreover, there is a relationship between marijuana use and **abnormal brain development**; **progression to use of other drugs**; **schizophrenia**; and **depression** and **anxiety**.

In evaluating the knowledge base on the effects of marijuana, it is important to recognize that over the past three decades, the potency of marijuana, measured by concentration of THC, has increased by about 300 percent.[6] Volkow, et al. (2014) note that this change in the drug "raises questions about the current relevance of findings in older studies on the effects of marijuana use, especially studies that assessed long-term outcomes" (p. 2222). The authors observe that the

consequences of marijuana use may be much worse today because of the increase in potency. For example, they highlight the increased number of emergency department visits involving marijuana and other drugs. From 2004 to 2011, the number of marijuana-related ED visits increased significantly – 100 percent when used alone and 62 percent when used in combination – whereas during this time there were no significant changes in the number of ED visits related to cocaine and heroin.[7]

There is a paucity of knowledge about how policies related to marijuana and other drugs impact public health. Volkow, et al. (2014) draw attention to the well-established relationship between perceived risk of harm of marijuana and prevalence of marijuana use among youth. Decades of youth self-report survey data show that as perceived risk of harm from marijuana declines, the rate of marijuana use increases.[8] Over the past few years, perception of harm from the use of marijuana has dropped, indicating the nation may be on the precipice of a forthcoming rise in youth marijuana use. The authors focus on the need for more information about the impact of cultural permissiveness and social policy changes on marijuana use prevalence rates and about the effects of second-hand exposure to marijuana smoke, both of which will directly impact the public health.

The marijuana policy climate in the United States has changed dramatically over the past two decades. A movement advocating the use of smoked marijuana as medicine has prompted many changes to state laws to permit the use, manufacture and sale of marijuana for loosely defined medical purposes. Given this backdrop, it is even more important that Volkow, et al. (2014) recognize the strong potential for the development of cannabinoid-based medications, approved by the U.S. Food and Drug Administration as are other medicines, to treat a variety of medical conditions. They reiterate the findings of the Institute of Medicine which focus on the need for research on synthetic or pharmaceutically pure cannabinoids, rather than smoked marijuana, to produce standardized and clinically, rigorously evaluated products.[9]

The ballot initiatives passed by voters in the states of Colorado and Washington to legalize marijuana for persons age 21 and older made these states the first places in the world to legalize the production, sale and use of marijuana for "recreational" purposes in November 2012. These two states which had previously established medical marijuana industries are now the first to experience a commercialized marijuana industry that mirrors the industries of alcohol and tobacco.

At this time, when support for marijuana legalization in the United States is at its highest[10] and three quarters of Americans expect marijuana to eventually become legal nationally,[11] it is urgent for the facts about marijuana to be shared widely to inform national policies regarding marijuana.

The conclusions of Volkow, et al. (2014) cannot be clearer:

> "Repeated marijuana use during adolescence may result in long-lasting changes in brain function that can jeopardize educational, professional and social achievements. However, the effects of a drug (legal or illegal) on individual health are determined not only by its

pharmacologic properties but also by its availability and social acceptability. In this respect, legal drugs (alcohol and tobacco) offer a sobering perspective, accounting for the greatest burden of disease associated with drugs not because they are more dangerous but because their legal status allows for more widespread exposure. As policy shifts toward legalization of marijuana, it is reasonable and probably prudent to hypothesize that its use will increase and that, by extension, so will the number of persons for whom there will be negative health consequences." (p.2225-2226)

The implications of this scientific review are obvious. Marijuana is a drug of abuse that produces serious adverse health consequences. Increasing the availability and social approval of marijuana use through its legalization (for medical or "recreational" uses) is not in the interest of the nation's public health or public safety.

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