

Clearing the Smoke on Cannabis

Highlights

This document highlights findings from a series of reports that reviews the effects of cannabis use on various aspects of human functioning and development. Specifically, the reports address: Chronic Use and Cognitive Functioning and Mental Health; Maternal Cannabis Use during Pregnancy; Cannabis Use and Driving; Respiratory Effects of Cannabis Smoking; and Medical Use of Cannabis and Cannabinoids.

What is it?

- Cannabis is somewhat like tobacco—a greenish or brownish substance that’s made by drying the flowering, fruiting tops and leaves of the plant *Cannabis Sativa*.
- Cannabis is known by many names including: marijuana, weed, hash—and others.
- Cannabis is often smoked as a “joint” or by using a water pipe or “bong” (where the smoke is drawn through water before inhaling it to cool it and filter out small particles).

Who’s using it?

Cannabis is the most widely used illicit drug in Canada.

- About 11% of all Canadians aged 15 and older have used cannabis at least once in the past year according to the 2013 Canadian Tobacco, Alcohol and Drugs Survey (CTADS).
- In the 2013 CTADS report, about 28% of those who used cannabis in the past three months reported that they used it every day or almost every day.
- The use of cannabis is generally higher among youth. According to CTADS, the rate of past-year use in 2013 was more than three times higher among Canadian youth aged 15–24 years (24.4%) compared to adults (8.0%). Approximately 22% of youth aged 15–19 and about 26% of young adults aged 20–24 reported using cannabis during the past year in 2013.
- Nearly 3% of drivers in Canada reported driving within two hours of using cannabis in 2012; 5% of youth drivers aged 15–24 reported such behaviour according to the 2012 Canadian Alcohol and Drug Use Monitoring Survey.



What does *chronic* use mean?

Researchers don't have a single definition for *chronic use*, but in general, the term refers to weekly or more frequent use over months or years, posing a possible risk to a user's health. Other terms that are often used interchangeably with *chronic use* include heavy use, frequent use, regular use, long-term use, abuse, and dependence.

What's the issue?

A growing body of research evidence suggests that using cannabis could negatively affect different aspects of people's lives, including:

- Mental and physical health;
- Cognitive functioning (skills such as memory, attention span and psychomotor speed);
- Ability to drive a motor vehicle; and
- Health and development of children born to those who use cannabis.

High on Cannabis—What does that mean?

- *People will use cannabis because it makes them feel happy, relaxed or very aware—or in some cases if people are ill, they use it to help increase their appetite or reduce their pain.*
- *Other symptoms of "being high" on cannabis include decreased attention span, increased heart rate, slowed reaction times, and a lack of a sense of time. These can last several hours. Sometimes less enjoyable symptoms—like nervousness or paranoia—can be experienced.*

Cannabis and Cognitive Functioning and Mental Health

Definition: *Cognitive functioning* refers to skills such as memory, attention span and psychomotor speed—the amount of time it takes a person to process a signal, prepare a response and carry out that response.

Definition: *Psychosis* is a serious mental disorder in which people lose touch with reality so that they are unable to function normally in society. It is often characterized by delusions and hallucinations.

Key Findings:

Cognitive Functioning

- Long-term cannabis use does not appear to produce significant, lasting cognitive impairments (problems with memory, attention, or other cognitive problems) in adults.
- Most of the negative effects that cannabis has on memory or learning disappear following several weeks of not using cannabis.

BUT...

- Starting cannabis use early in adolescence—while the brain is still developing—may lead to more lasting problems.
- Although the cognitive deficits caused by cannabis use are likely reversible after a month of discontinued use in adults, the same may NOT be true for those who start using cannabis in early adolescence.
- Impairment is related to recent but not cumulative use.

Mental Health

- People who use cannabis—especially frequent users—are at increased risk for psychosis and psychotic symptoms.
- Those who are already prone to psychosis (i.e., they may have a family member who suffers from psychosis) are especially at increased risk for developing psychosis with cannabis use.

Implications:

- Efforts to inform the public—such as educational campaigns—about the risks of long-term cannabis use may help Canadians make informed choices about using cannabis.

- Efforts to prevent, reduce or delay the use of cannabis—especially among youth who are particularly susceptible to the risks posed by cannabis—could result in decreased rates of mental health disorders, saving unnecessary suffering and costs to the healthcare system.

Cannabis and Maternal Use during Pregnancy

Definition: Maternal use of cannabis refers to the use of cannabis during pregnancy.

Key Findings:

- Cannabis is the most commonly used illicit drug during pregnancy.
- No link has been demonstrated to exist between heavy cannabis use during pregnancy and premature births, miscarriages or major physical abnormalities.
- Cannabis use during pregnancy has been shown, however, to affect the development and learning skills of children starting at about the age of 3 years, and these effects continue at least until the children's teenage years.
- Specifically, cannabis use during pregnancy has been shown to affect children's cognitive functioning, behaviour, substance use and mental health.
- There is emerging evidence of an increased likelihood of smoking, substance abuse and delinquency among adolescents who were prenatally exposed to cannabis.

Implications:

- A child who was exposed to cannabis as a fetus may experience problems with academic functioning. This might require additional educational supports to help protect against future learning problems.
- Efforts to prevent or reduce cannabis use during pregnancy could have significant benefits to future generations, potentially reducing rates of mental health problems and substance use.
- Information on the effects of cannabis use during pregnancy is essential to help healthcare providers advise patients about the impact of cannabis use and improve the health and well-being of patients' children.

Cannabis and Driving

Definition: Drug-impaired driving refers to the operation of a motor vehicle, including snowmobiles, all-terrain vehicles, boats, trains and airplanes, while one's ability is adversely affected by a drug, including illegal drugs, prescription drugs, over-the-counter medications and volatile inhalants such as toluene or nitrous oxide.

Key Findings:

- Among young drivers in Canada, driving after using cannabis is more prevalent than driving after drinking.
- Males are three times more likely than females to drive after using cannabis.
- Cannabis impairs the cognitive and motor abilities necessary to operate a motor vehicle and doubles the risk of crash involvement.
- After alcohol, cannabis is the most commonly detected substance among drivers who die in traffic crashes in Canada.
- The police have the tools and authority required to detect and arrest drivers who are impaired by cannabis.

Effects of Cannabis on Driving Performance

Cannabis can compromise a driver's reaction time and visual ability. While experienced drivers may be able to compensate for some of these effects, decreased attention and impaired decision making can increase the likelihood of a crash.

Implications:

- Increased use of cannabis in Canada may contribute to increasing rates of cannabis-impaired driving. Efforts to prevent, reduce or delay cannabis use—especially in youth—will help to prevent or decrease rates of cannabis-impaired driving in Canada.
- Many people are not aware that cannabis use impairs their ability to drive, that cannabis use can be detected in drivers, and that those caught will be charged just as if they were impaired by alcohol. Greater efforts are needed to ensure that drivers understand the risks of driving after using cannabis.

- To be successful, any approach to reduce cannabis-impaired driving—and cannabis use in general—must target high-risk groups (such as youth) and will require a combination of research, prevention, enforcement and treatment or rehabilitation.

Detecting Drivers Impaired by Cannabis

Unlike alcohol, cannabis cannot be detected by a breath test. But the Drug Evaluation and Classification (DEC) program is used to help law enforcement recognize and evaluate behaviours and other psychological indicators that are common with cannabis and six other drugs. This information, together with a urine, oral fluid and/or blood test, can provide enough evidence for drug-impaired driving charges to be laid.

Cannabis and Respiratory Effects

Definition: The term *respiratory effects* refers to symptoms or ailments such as chronic obstructive pulmonary disease (COPD—a group of lung diseases without a cure, including emphysema and chronic bronchitis), lung cancer and infections of the lower respiratory tract such as pneumonia.

Key Findings:

- Cannabis smoke contains a mixture of poisons that are similar to tobacco smoke, and THC—the active ingredient in cannabis—may make the lungs and airways more susceptible to respiratory problems.
- Research suggests smoking cannabis may be even more harmful to a person’s airways and lungs than smoking tobacco, since cannabis smoking often involves unfiltered smoke, larger puffs, deeper inhalation and longer breath-holding. This means the negative respiratory effects may occur earlier with cannabis smoking.

The respiratory system is the airways, lungs and muscles that you use to breathe.

- Regular users of cannabis commonly report coughing on most days, wheezing, shortness of breath after exercise, chest tightness at night, sounds in their chest, early morning phlegm and mucus, and bronchitis.
- Cannabis smoke contains many of the same carcinogens (cancer-causing chemicals) as tobacco smoke—making a link between smoking cannabis and lung cancer a possibility worthy of further research.

Implications:

- Clear messages about the risks to the lungs and airways and the potential suffering and costs to the healthcare system need to be communicated so that Canadians can make informed decisions about their use of cannabis.
- For those who choose to use cannabis, ways of inhaling the drug without smoking it may help to reduce—although not eliminate—the harms to the respiratory system (vaporizing the drug to release the active ingredients instead of burning it).

Medical Use of Cannabis and Cannabinoids

Definition: In Canada, cannabis for medical purposes is legally accessed through the *Marihuana for Medical Purposes Regulations*. Authorization for access is provided by healthcare practitioners through a medical document.

Definition: *Cannabinoids* are chemicals found in the cannabis plant. A few account for most of the known actions of cannabis on mental and bodily functions. Cannabinoids may be natural (e.g., THC) or synthetic (i.e., made in a laboratory).

Key Findings:

- Good quality evidence suggests that cannabis and cannabinoids are effective for the relief of nausea and vomiting, and certain types of pain, as well as for the stimulation of appetite. However, research to date does not indicate that cannabis and cannabinoids are always the best drugs to use for these purposes compared to newer drugs for nausea and pain relief.
- It has been suggested that cannabinoids may be usefully combined with other drugs to produce better methods of clinical use.

- There is a lack of research about the risks associated with the medical use of cannabis; however reduced cognitive functioning and respiratory ailments are associated with recreational use.
- Patients who smoke cannabis for medical purposes are not assured the reliable, standardized and reproducible dose that they would otherwise receive from using cannabinoid products delivered in controlled doses (e.g. capsules, oral sprays).
- Research is currently examining the efficacy of potential therapeutic uses of cannabinoid products for conditions such as multiple sclerosis, cancer and glaucoma, but the findings from this research are mixed.

Implications:

- Health professionals need access to the best available scientific evidence to help patients make informed decisions about the use of cannabis and cannabinoids.
- Given the impairing effects of cannabis on driving, physicians should advise their patients to refrain from operating a motor vehicle while under the influence of cannabis.
- Future development is likely to be focused on improving the specificity of synthetic cannabinoids and their delivery by safer methods than smoking.

What Role Can You Play in Preventing or Reducing the Negative Effects of Cannabis?

Whether you are a researcher, research funding agency, manager, healthcare professional, health promoter, teacher, law enforcement professional, parent, or a person who uses cannabis, you have a role to play.

- Know the effects of cannabis use on human functioning and development—and help to make sure others have this knowledge too.
- Support efforts—whether they be in research, prevention, enforcement or treatment—to prevent, reduce or delay cannabis use or the harms associated with cannabis use.

Cannabis is a controlled substance under the Controlled Drugs and Substances Act—meaning that the acts of growing, possessing, distributing and/or selling cannabis are illegal.

About the *Clearing the Smoke on Cannabis Series*

This series reviews the effects of cannabis use on various aspects of human functioning and development. Each report was prepared by an expert researcher in the field and peer reviewed. The production of the series was made possible through a financial contribution from Health Canada. The views expressed in the reports do not necessarily represent the views of Health Canada.

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About CCSA

The Canadian Centre on Substance Abuse has a legislated mandate to provide national leadership and evidence-informed analysis and advice to mobilize collaborative efforts to reduce alcohol- and other drug-related harms.

ISBN 978-1-77178-237-1

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