



▶ **Does cannabis use increase  
the risk of developing  
psychosis or schizophrenia?**

---

CANNABIS EVIDENCE BRIEF



Government  
of Canada

Gouvernement  
du Canada

Canada 

---

### **BRIEFS AVAILABLE IN THIS SERIES:**

- ▶ *Is cannabis safe to use? Facts for youth aged 13–17 years.*
- ▶ *Is cannabis safe to use? Facts for young adults aged 18–25 years.*
- ▶ *Does cannabis use increase the risk of developing psychosis or schizophrenia?*
- ▶ *Is cannabis safe during preconception, pregnancy and breastfeeding?*
- ▶ *Is cannabis addictive?*

### **PURPOSE:**

This fact sheet provides basic information about the link between cannabis use and the development of psychosis or schizophrenia. It is intended to provide source material for public education and awareness activities undertaken by medical and public health professionals, including mental health practitioners.

© Her Majesty the Queen in Right of Canada, as represented by the Minister of Health, 2018

Publication date: August 2018

This document may be reproduced in whole or in part for non-commercial purposes, without charge or further permission, provided that it is reproduced for public education purposes and that due diligence is exercised to ensure accuracy of the materials reproduced.

Cat.: H14-264/2-2018E-PDF

ISBN: 978-0-660-27407-2

Pub.: 180236

## ▶ **Key messages**

In light of cannabis use being legalized in Canada for people over 18 years old (or 19 in some provinces and territories), understanding the associated risks of its use is critical to help Canadians make informed decision about their own health.

The risk of developing psychosis or schizophrenia may increase when cannabis is used more frequently, especially on a daily and near-daily use.

The use of high-potency cannabis products has been linked to an increased risk of psychosis.

The risk of developing psychosis or schizophrenia may increase when cannabis use is initiated before the age of 16.

Persons with a family history of psychosis or schizophrenia who use cannabis are at greater risk of developing psychosis and schizophrenia.

Canadians should speak with their medical and public health professionals for more information about using cannabis and its effects on their health.

## ▶ Supporting information

For: Medical and public health professionals, including mental health practitioners

---

### How does cannabis affect the brain?

Cannabis contains hundreds of chemical substances. Over 100 of these chemicals are known as cannabinoids. Cannabinoids are chemicals that can change how cells communicate with one another. When in the brain, this can affect the way someone perceives their environment, thinks, behaves and feels. THC is the cannabinoid in cannabis that is mainly responsible for the psychoactive effects of cannabis.

### Does using cannabis increase the risk of psychosis or schizophrenia?

Yes. Although the exact underlying mechanism is still largely unknown, there is strong evidence that using cannabis may increase the risk of an individual developing psychosis and schizophrenia. There are also certain risk factors that studies have shown to be a good predictor of psychosis and schizophrenia in cannabis users:

**Age at first use** Earlier-onset cannabis use is associated with an increased risk of earlier onset psychosis with cannabis users under the age of 16 at greater risk of developing psychosis or schizophrenia.<sup>1-6, 6</sup> It has been found that cannabis use brings on psychosis 3 years earlier in psychotic patients who use compared to those who don't use cannabis.<sup>5, 7</sup> Although further research is needed, studies have found structural and functional alterations that may occur to the brain with chronic use<sup>4</sup> and which may have negative consequences, especially on the developing brain of adolescents.<sup>1, 4</sup>

**Frequency and potency** There is strong evidence of a dose-response relationship between the level of cannabis use and the risk of psychosis<sup>2</sup> and schizophrenia.<sup>8</sup> Any cannabis use is associated with a 40% increased risk of psychosis.<sup>8, 9</sup> Higher frequency of cannabis use has been shown to increase the risk and severity of symptoms of psychosis and developing psychotic disorders compared to less frequent users.<sup>1, 3, 6, 10, 11</sup> Daily use increases that risk to between two- and three-fold compared to non-users.<sup>12</sup> Daily, or near-daily use presents the greatest risk factors for harms.<sup>1, 3, 10</sup>

Use of higher potency cannabis products has also been associated with an increased risk of psychotic symptoms as well as an earlier onset of psychosis.<sup>6, 11, 13</sup>

Cannabis dependence is also associated with a greater risk of psychosis/ schizophrenia.<sup>14</sup> Stopping or reducing cannabis use has been shown to improve psychotic symptoms and outcome.<sup>15, 16</sup>

**Family History** Persons with a family history of psychosis or schizophrenia can have a genetic predisposition to psychotic disorders, which make them more susceptible.<sup>1, 10</sup> While the degree of this association is inconsistent, studies suggest cannabis users with a family history of psychosis are 2.5 to 10 times more likely to develop psychotic disorders, compared to non-users with a family history.<sup>8</sup>

It is recommended that persons with a family history of psychosis or schizophrenia refrain from using cannabis.<sup>1</sup>

It has been estimated that cannabis use can account for between 8% and 14% of schizophrenia cases. However, the prevalence of schizophrenia has not increased with increased prevalence of cannabis use.<sup>8</sup>

## ▶ References

---

1. Fischer B, Russell C, Sabioni P, van den Brink W, Le Foll B, Hall W, Rehm J, Room R. Lower-risk cannabis use guidelines: A comprehensive update of evidence and recommendations. *Am J Public Health* 2017 Aug; 107(8):1277.
2. Marconi A, Di Forti M, Lewis CM, Murray RM, Vassos E. Meta-analysis of the association between the level of cannabis use and risk of psychosis. *Schizophr Bull* 2016 Feb 15.
3. National Academies of Sciences, Engineering, and Medicine. The health effects of cannabis and cannabinoids: The current state of evidence and recommendations for research. Washington, D.C.: National Academies Press; 2017.
4. Batalla A, Bhattacharyya S, Yucel M, Fusar-Poli P, Crippa JA, Nogue S, Torrens M, Pujol J, Farre M, Martin-Santos R. Structural and functional imaging studies in chronic cannabis users: A systematic review of adolescent and adult findings. *PLoS One* 2013;8(2):e55821.
5. Large M, Sharma S, Compton MT, Slade T, Nielssen O. Cannabis use and earlier onset of psychosis: A systematic meta-analysis. *Arch Gen Psychiatry* 2011 Jun;68(6):555-61.
6. Di Forti M, Sallis H, Allegri F, Trotta A, Ferraro L, Stilo SA, Marconi A, La Cascia C, Reis Marques T, Pariante C, *et al.* Daily use, especially of high-potency cannabis, drives the earlier onset of psychosis in cannabis users. *Schizophr Bull* 2014 Nov;40(6):1509-17.
7. Helle S, Ringen PA, Melle I, Larsen TK, Gjestad R, Johnsen E, Lagerberg TV, Andreassen OA, Kroken RA, Joa I, *et al.* Cannabis use is associated with 3 years earlier onset of schizophrenia spectrum disorder in a naturalistic, multi-site sample (N=1119). *Schizophr Res* 2016 Jan;170(1):217-21.
8. Radhakrishnan R, Wilkinson ST, D'Souza DC. Gone to pot - A review of the association between cannabis and psychosis. *Front Psychiatry* 2014 May 22;5:54.
9. Moore TH, Zammit S, Lingford-Hughes A, Barnes TR, Jones PB, Burke M, Lewis G. Cannabis use and risk of psychotic or affective mental health outcomes: A systematic review. *Lancet* 2007 07/28;370(1474-547; 9584):319-28.
10. World Health Organization (WHO). The health and social effects of nonmedical cannabis use.

11. Di Forti M, Marconi A, Carra E, Fraitetta S, Trotta A, Bonomo M, Bianconi F, Gardner-Sood P, O'Connor J, Russo M, *et al.* Proportion of patients in south london with first-episode psychosis attributable to use of high potency cannabis: A case-control study. *Lancet Psychiatry* 2015 Mar;2(3):233-8.
12. Fergusson DM, Horwood LJ, Ridder EM. Tests of causal linkages between cannabis use and psychotic symptoms. *Addiction* 2005 Mar;100(3):354-66.
13. Pierre JM, Gandal M, Son M. Cannabis-induced psychosis associated with high potency "wax dabs". *Schizophr Res* 2016 Apr;172(1-3):211-2.
14. Wilkinson ST, Radhakrishnan R, D'Souza DC. Impact of cannabis use on the development of psychotic disorders. *Curr Addict Rep* 2014 Jun 1;1(2):115-28.
15. Schoeler T, Monk A, Sami MB, Klamerus E, Foglia E, Brown R, Camuri G, Altamura AC, Murray R, Bhattacharyya S. Continued versus discontinued cannabis use in patients with psychosis: A systematic review and meta-analysis. *Lancet Psychiatry* 2016 Mar;3(3):215-25.
16. Schoeler T, Petros N, Di Forti M, Klamerus E, Foglia E, Ajnakina O, Gayer-Anderson C, Colizzi M, Quattrone D, Behlke I, *et al.* Effects of continuation, frequency, and type of cannabis use on relapse in the first 2 years after onset of psychosis: An observational study. *Lancet Psychiatry* 2016 Aug 23.