



CIHR  
IRSC

Institute of Neurosciences,  
Mental Health and Addiction

Institut des neurosciences, de la  
santé mentale et des toxicomanies



# What We Heard: End of Grant Knowledge Exchange Workshop Report

Catalyst Grant: Population Health Intervention Research on  
Legalization of Cannabis

Meeting date: June 11, 2019



Instituts de recherche  
en santé du Canada

Canadian Institutes  
of Health Research

Canada

### Canadian Institutes of Health Research

At the Canadian Institutes of Health Research (CIHR), we know that research has the power to change lives. As Canada's health research investment agency, we collaborate with partners and researchers to support the discoveries and innovations that improve our health and strengthen our health care system.

### CIHR Institute of Neurosciences, Mental Health and Addiction

The CIHR Institute of Neurosciences, Mental Health and Addiction (CIHR-INMHA) invests in fundamental and clinical research on the brain and spinal cord to enhance the understanding of cognitive, emotional and sensorimotor functions. Advances in these areas will ensure a brighter future for Canadians living with neurological and mental health conditions.

Canadian Institutes of Health Research  
160 Elgin Street, 9th Floor  
Address Locator 4809A  
Ottawa, ON K1A 0W9  
[www.cihr-irsc.gc.ca](http://www.cihr-irsc.gc.ca)

CIHR Institute of Neurosciences, Mental Health and Addiction  
University of Calgary, Cumming School of Medicine  
Heritage Medical Research Building, Room 172  
3330 Hospital Drive NW  
Calgary, AB T2N 4N1  
[www.cihr-irsc.gc.ca/e/8602.html](http://www.cihr-irsc.gc.ca/e/8602.html)

Also available on the Web in PDF and HTML formats

© Her Majesty the Queen in Right of Canada (2020)

Cat. No. MR4-85/2020E-PDF  
ISBN 978-0-660-34347-1

*This publication was produced by the Canadian Institutes of Health Research. The views expressed herein do not necessarily reflect those of the Canadian Institutes of Health Research. All people profiled in this publication have agreed to their appearance in it and approved their individual stories.*

# Table of Contents

<b>INTRODUCTION .....</b>	<b>4</b>
<b>WORKSHOP OBJECTIVES .....</b>	<b>5</b>
<b>MESSAGE FROM CIHR INSTITUTE OF NEUROSCIENCES, MENTAL HEALTH AND ADDICTION SCIENTIFIC DIRECTOR.....</b>	<b>6</b>
<b>SESSION 1: MONITORING THE IMPACTS OF LEGALIZATION .....</b>	<b>7</b>
Legalization of Recreational Cannabis Use in Canada: A Knowledge Synthesis.....	7
Enabling the Monitoring and Advancement of Knowledge on Exposure to Cannabis Use.....	7
A Data Infrastructure for Monitoring the Impact of Cannabis Legalization: Data Collection and Linkage Strategies to Inform Health and Social Policy .....	8
Cannabis Legalization and Mental Health Outcomes Monitoring System: Trends and Patterns of Cannabis Use in Inpatient Psychiatry in Ontario, 2007 to 2017 .....	9
Provincial and Key Community Responses to Federal Cannabis Legalization: A Multi- Jurisdictional Study.....	9
The Impact of Cannabis Legalization on Campus Health: A Multi-Method Approach to Establishing a Baseline and Monitoring Change.....	10
Knowledge User’s Perspective and Panel Discussion.....	10
<b>SESSION 2: PRIORITY POPULATIONS .....</b>	<b>13</b>
Targeted Cannabis Prevention for Youth at High-Risk for Psychosis .....	13
Development of a Canadian Youth Cannabis Survey: Understanding Changing Aspects of Cannabis Use Among Young Canadians .....	14
Influence of Cannabis Exposure in Pregnancy on Offspring Perinatal and Childhood Health Outcomes: A Population-Based Birth Cohort .....	14
Trajectories of Marijuana Use Across a Decade: Their Predictors in Adolescence and Impact on Health, Academic, Social, and Economic Outcomes in Young Adulthood.....	15
Impact of Cannabis Legalization on Cannabis Use and Outcomes in Patients with Opioid Use Disorder: A Canadian Prospective Cohort Study.....	15
Knowledge User’s Perspective and Panel Discussion.....	16
<b>SESSION 3: IMPAIRMENT .....</b>	<b>18</b>
Perceptions and Characteristics of Individuals who Drive Under the Influence of Cannabis .....	18
Towards Monitoring of Driving while Impaired by Cannabis and/or Other Drugs .....	18
Taking 9 to 5? Clearing the Haze on Cannabis Consumption in the Canadian Workplace .....	19
Knowledge User’s Perspective and Panel Discussion.....	19
<b>SESSION 4: STAKEHOLDERS AND RESEARCHERS NEEDS.....</b>	<b>21</b>
Cannabis Use Disorder and Recovery – An Inside View .....	21
Youth Engagement in Research Planning, Design and Evaluation .....	22
Plenary Discussion.....	22
<b>CONCLUSION .....</b>	<b>24</b>
<b>APPENDICES.....</b>	<b>25</b>

# Introduction

---

On June 11, 2019, the Canadian Institutes of Health Research (CIHR), in collaboration with the Canadian Centre on Substance Use and Addiction (CCSA) hosted an end-of-grant Knowledge Exchange Workshop in Ottawa, ON, for the Catalyst Grant: Population Health Intervention Research on Legalization of Cannabis. In total, 14 research teams were funded through this competition, and each team was required to include at least one knowledge user in their projects.

This report comprises a synthesis of the evidence presented by the 14 research teams, a summary of knowledge user and stakeholder perspectives that were shared, and highlights from the discussions that followed.

**Disclaimer:**

The following information is intended to summarize what we heard at the workshop. CIHR has made every effort to share this text with project participants for their review, therefore any errors or omissions are unintentional. This report should not be taken as a definitive account of research results and readers are advised to follow up directly with grant recipients for the most current information on their projects.

The meeting book for this workshop is available to the public upon request. Requests can be directed to the CIHR Contact Centre: [support-soutien@cihr-irsc.gc.ca](mailto:support-soutien@cihr-irsc.gc.ca).

# Workshop Objectives

---

**The primary objectives of the workshop were to:**

- Facilitate the exchange of knowledge generated through projects related to how the legalization and regulation of non-medical cannabis in Canada could directly or indirectly impact population health and health equity among stakeholders and researchers.
- Encourage a dialogue between the research community, policy makers, and other relevant stakeholders to explore how this evidence may inform ongoing and future development of cannabis-related policies, practices, and programs.
- Discuss evidence needs, and the most efficient way of acquiring/generating that evidence, to assist in the monitoring and evaluation of potential benefits, harms and unintended consequences of the legalization and regulation of non-medical cannabis.

# Message from CIHR Institute of Neurosciences, Mental Health and Addiction Scientific Director

---

On October 17, 2018, the Cannabis Act came into force in Canada, legalizing non-medical cannabis products including fresh and dried cannabis, and cannabis oils. Other products, such as edible products and concentrates, are expected to be legal for sale in fall 2019.

There remain many unknowns about the use of cannabis, its health and safety effects and the behavioural, social, cultural, ethical and economic implications of legalization both nationally and across jurisdictions. A number of reports have highlighted the need for enhanced research evidence to inform policy, therapeutic practice, and harm reduction and prevention efforts.

CIHR is supporting the need for new knowledge on cannabis through its Integrated Cannabis Research Strategy (ICRS), which aims to identify and fill evidence gaps in specific target areas. The overarching vision of the ICRS is to provide a well-coordinated series of activities to position Canada as a leader in developing the research capacity and amassing the research evidence needed on the effects of cannabis. This includes validating the potential therapeutic benefits of cannabis, as well as understanding risks and harms, and supporting policy and regulatory models for studying cannabis use (including development of common data standards).

In January 2018, CIHR invested \$1.4 million through the ICRS to support 14 projects to catalyze future research related to the health impacts of cannabis legalization. This catalyst grant funding opportunity had a specific focus on population health intervention research related to the legalization and regulation of non-medical cannabis in Canada. Specifically, these projects were designed to support the collection of population health data on cannabis use, to understand how the legalization and regulation of cannabis would affect certain groups, and to evaluate existing regulatory models for controlled substances.

This workshop brought together researchers, policy makers, community members including people with lived and living experience, and other knowledge users, to share information and generate new ideas. It also offered an opportunity to look forward, to the work that still needs to be done and how that can be catalyzed by the existing knowledge base.

On behalf of CIHR, I would like to thank the Canadian Centre on Substance Use and Addiction (CCSA) for their support of this workshop and their contributions as knowledge users on three of the 14 catalyst grants. CIHR is fortunate to have knowledge partners such as CCSA to ensure the maximum impact of the research findings from these funding opportunities and to move new cannabis knowledge into action.

Last but not least, thank you to all of the researchers, knowledge users, stakeholders and colleagues for participating in this important knowledge exchange event. Together, we have the potential to make Canada a world-leader in cannabis research.



Samuel Weiss, PhD, FRSC, FCAHS  
Scientific Director, CIHR Institute of Neurosciences, Mental Health and Addiction

# Session 1: Monitoring the Impacts of Legalization

---

This session included six research presentations and a knowledge user panel discussion addressing the overall impacts of cannabis legalization.

## Legalization of Recreational Cannabis Use in Canada: A Knowledge Synthesis

*Presented by: Sareen Singh, McGill University*

Ms. Singh presented results from a secondary data analysis to assess the impact of recreational cannabis legalization on rates of fatal motor vehicle crashes and crash fatalities, as well as results from a scoping review of published and grey literature on prenatal cannabis use and from an overview of cannabis regulatory approaches in North America.

Using data from the US, the researchers identified a 4% increase in the rate of fatal crashes and a 6% increase in crash fatalities in nine jurisdictions that had legalized recreational cannabis. A similar rate in Canada would mean 110 additional deaths annually. In a sensitivity analysis, the researchers found no difference between the first year of legalization and subsequent years of legalization, suggesting that the association persists after the first year.

Data on cannabis use in pregnant women were obtained from diverse populations and included varied methods of reporting. The researchers found that use was highest in the first trimester and increasing across years, but that there exists a lack of information on the frequency of use and gestational age of exposure overall. No before-after legalization studies were identified. An association between prenatal cannabis use and select adverse neonatal health outcomes was observed.

Ms. Singh noted that there is variation among cannabis regulations and that monitoring and evaluation of regulations is necessary, in particular: minimum age of use, consumption limited to private property vs. permitted in some public areas, and driving laws.

## Enabling the Monitoring and Advancement of Knowledge on Exposure to Cannabis Use

*Presented by: Pamela Kaufman, University of Toronto*

Dr. Kaufman discussed her study, which incorporated a scoping review on second-hand cannabis smoke exposure, analyses of self-reported data from existing population surveys, and the development of an online Cannabis Informatics Monitoring System (CIMS).



The researchers highlighted a lack of data on the health effects of second-hand and third-hand exposure to cannabis smoke, but noted second-hand cannabis smoke contains similar chemicals to second-hand tobacco smoke, including at least 33 known carcinogens. Limited data from animal studies suggest that there may be adverse respiratory and cardiovascular effects from cannabis smoke exposure. Further, human exposure studies have found that THC is detectable in people who do not use cannabis, but who have been exposed to second-hand cannabis smoke in certain environments (such as a small room with low ventilation).

The researchers analyzed 2017 data from the Centre for Addiction and Mental Health (CAMH) Monitor Survey and found that 7.5% of Ontarians living in multi-unit housing reported being exposed to cannabis smoke in their residences. This self-reported exposure to environmental cannabis smoke was similar to environmental tobacco smoke (6.6%). Individuals exposed to cannabis smoke were single, had used cannabis in the past 12 months, and had lower household incomes.

More research is needed on the health effects of cannabis smoke exposure, and regulations should consider where and how much people are exposed to cannabis smoke. Environmental cannabis smoke exposure in multi-unit housing should continue to be monitored to determine changes from pre- to post-legalization.

Dr. Kaufman indicated that the searchable online CIMS database will be modeled after the existing Tobacco Informatics Monitoring System ([tims.otru.org](https://tims.otru.org)) and will include pre-analyzed population data for key cannabis indicators with downloadable graphs and tables. Several population surveys have already been included and more will be added as they become available.

## **A Data Infrastructure for Monitoring the Impact of Cannabis Legalization: Data Collection and Linkage Strategies to Inform Health and Social Policy**

*Presented by: Nathan Nickel, University of Manitoba*

Dr. Nickel highlighted one benefit of legalization, which is the improved ability to track non-medical cannabis use among the Canadian population. His team's strategy is to take advantage of a rich data repository that exists in the province of Manitoba in order to link cannabis use with other outcomes, including those documented in health care (including pharmacy and hospital data), justice (charges, court system, incarceration), education (K-12 and postsecondary), and social services (income assistance, social welfare) records. This approach provides comprehensive, long-term outcome data that is linkable at the individual and family level, and is free from recall bias and other limitations present in self-reported outcome data.

The team is currently in the process of developing a system to collect cannabis use information. This includes testing data collection approaches and developing a user-experience app to collect cannabis use information including strain, amount consumed and experience. The survey will then request consent to link this data with information already in the repository.

Dr. Nickel noted that relying on self-reported outcome data limits our ability to understand short and long-term outcomes associated with non-medical cannabis use. Therefore, linking cannabis use information with the robust administrative data that exists in Manitoba provides an opportunity to better understand impacts and long-term outcomes associated with cannabis use.



## Cannabis Legalization and Mental Health Outcomes Monitoring System: Trends and Patterns of Cannabis Use in Inpatient Psychiatry in Ontario, 2007 to 2017

*Presented by: Christopher Perlman, University of Waterloo*

Dr. Perlman presented his work investigating the prevalence of cannabis use among individuals hospitalized in designated mental health beds in Ontario in the ten years prior to the legalization of non-medical cannabis. Using comprehensive interRAI Mental Health assessment data from 2007-2017, the researchers looked at cannabis use, other substance use, DSM diagnoses and other variables.

This study identified an increasing trend from 2007 to 2017 in both recent use (within 30 days of admission) and cannabis use overall among all age groups, sexes and diagnoses. The prevalence of cannabis use increased from 15% in 2007 to 27% in 2017. The prevalence of cannabis use was highest among individuals aged 18-24 (43%); however, large increases were observed in all age groups. The highest prevalence of use was among males (25%), individuals with schizophrenia or other psychoses (21%), and patients with personality disorders (26%). The largest increases in the prevalence of use were found among individuals with anxiety disorders, personality disorders, and schizophrenia or other psychotic disorders. Concurrent substance use, including use of other drugs and alcohol, was common.

Dr. Perlman noted the relationship between cannabis use and mental health is complicated, possibly reflecting changes to attitudes about use or increase in use for self-medication of mental health needs. He emphasized a need to evaluate patterns of cannabis use among those with mental health conditions, including the impact of legalization on this population.

## Provincial and Key Community Responses to Federal Cannabis Legalization: A Multi-Jurisdictional Study

*Presented by: Sergio Rueda, Centre for Addiction and Mental Health*

Dr. Rueda highlighted the urgent need to study Canada's federal cannabis legislation in the context of provincial regulatory responses and key community concerns. His study used qualitative data sources from four provinces (Quebec, Ontario, Alberta, British Columbia) and emphasized racialized communities and Indigenous groups.

Key themes that emerged from this study included the need for racialized community input and participation in policy design, and a strong desire for credible information about cannabis, including effective prevention messaging, particularly for parents and youth. More time to implement cannabis regulations, develop educational programs, and conduct community consultations (especially among Indigenous communities) were cited by the provinces as challenges following legalization.

Dr. Rueda noted data on ethnicity and immigrants is lacking and that perspectives from Indigenous and racialized communities are typically omitted from policy decision-making. He emphasized the need for knowledge translation and dissemination of cannabis research outcomes to inform policy development and to educate the public.

## The Impact of Cannabis Legalization on Campus Health: A Multi-Method Approach to Establishing a Baseline and Monitoring Change

*Presented by: Michelle St. Pierre, University of British Columbia*

Ms. St. Pierre discussed outcomes obtained through a survey that assessed levels of cannabis consumption and related health outcomes in young adults (undergraduate students age 18-25 at the University of British Columbia) during the periods directly before and after cannabis legalization (February 2018 – April 2019).

The research team noted there was no change in cannabis first-use or rate of use in the six months post-legalization. No changes in method of use were observed, though Ms. St. Pierre noted that edible cannabis was not yet legal at the time of survey.

It was observed (both pre- and post-legalization) that almost 25% of respondents used cannabis instead of alcohol and some individuals did so to intentionally reduce the amount of alcohol consumed. This study also revealed that post-legalization, young adults were less likely to cite health and driving safety as reasons for substituting cannabis for alcohol.

With regard to social norms the researchers noted that individuals who used cannabis perceived higher levels of cannabis use among their peers, and that the difference between actual and perceived levels of peer use was less pronounced subsequent to legalization.

### Knowledge User's Perspective and Panel Discussion

In this section, knowledge users presented their perspectives on each of the six research projects that they participated on. Meeting participants were then invited to ask questions and a group discussion followed.

#### Hanan Abramovici, Health Canada

Dr. Abramovici opened the panel discussion by emphasizing the current lack of understanding of the maternal and fetal outcomes of cannabis use during pregnancy and breastfeeding. Evidence-based regulations and public health education are needed to reduce risks.

In addition, there is a lack of knowledge regarding how cannabis use affects one's ability to drive. Although increased fatalities have been observed in some regions following legalization of cannabis, the data is complex and doesn't necessarily control for factors that may influence results, such as cannabis use with other substances.

More research and public education are needed to reduce the risks associated with cannabis use both during pregnancy and with respect to driving.

### Daphne Mayer, KFL&A Public Health

Ms. Mayer spoke on behalf of public health practitioners, indicating that although public health and clinical providers are confident about the risks of tobacco use and second-hand smoke exposure, there is limited information to support municipal policies, community services and public health messaging relating to cannabis. She noted there is also a need for knowledge on cannabis use/exposure and breastfeeding. New mothers are asking for information on the potential harms of cannabis, but public health nurses are less comfortable delivering programs, recommendations and services relating to cannabis due to the lack of a strong evidence base.

### Joss Reimer, Manitoba Health

Dr. Reimer noted retail models for cannabis are being extrapolated from existing alcohol models and there is a need for Canadian data to inform these structures within the Canadian context.

In addition, data is needed regarding cannabis use in the home in order to inform potential interventions and education. The data linkage work in Manitoba is particularly relevant with respect to these smaller-level policies, for example by providing evidence linking cannabis use in the home to possible outcomes for children such as risk in vehicles, education or health outcomes.

### Nawaf Madi, Canadian Institute for Health Information

Dr. Madi spoke about the importance of establishing a baseline for normative behaviour, in order to measure changing attitudes. He used tobacco as an example, highlighting the changing attitudes towards perceptions of smokers over time. He also noted that in a ten-year period leading to legalization, there was an increase in hospitalization rates due to cannabis. This is just one piece of the picture though, and with data still coming in, it will be important to continue research and knowledge exchange in order to gain insights into possible undesirable outcomes of cannabis legalization, particularly among youth.

### Tara Marie Watson, Centre for Addiction and Mental Health (CAMH)

Bringing forward discussions with other team members and the project's knowledge user, Dr. Watson spoke about the importance of collaborating and engaging with communities in culturally meaningful ways when conducting research. For example, when proposing to do any research with Indigenous communities, researchers need to learn about and adhere to community-driven research ethics principles, and engage with communities to understand their priorities and interests. In the recent research experiences she highlighted, she noted the importance of understanding issues related to new laws under cannabis legalization and Indigenous sovereignty. She also touched on key principles that researchers need to put into practice regarding Indigenous community ownership, protection, and access related to their data, including the use of collaborative research sharing agreements.

Dr. Watson noted that responsible, collaborative research includes fair compensation and appropriate recognition of contributions, and involving communities in meaningful ways as early as possible such as when developing research questions. This type of engagement and relationship building takes time and may not always be feasible in a one-year project.

In the case of this project (*Provincial and Key Community Responses to Federal Cannabis Legalization: A Multi-Jurisdictional Study*), early discussions with Indigenous communities and inclusion of members of racialized communities resulted in reframing the proposal and questions away from using a risk/deficit approach and towards more action-oriented and resiliency approaches. There are also strong desires to bring research findings back to communities. Participants often want to be involved in dissemination activities, including development of education and awareness tools, particularly education for youth and initiatives aimed at reducing longstanding health and social inequities.

#### Chelsey Hartwig, University of British Columbia

Ms. Hartwig, a campus health specialist, spoke about the challenges non-medical cannabis can have on campuses. For example, use is permitted on campus, so education about safe use, driving safety and second-hand exposure to tobacco in cannabis-use areas is a priority for students. She also highlighted the lack of harmonization across the country with respect to cannabis-use regulations on post-secondary campuses, reinforcing the need for ongoing education.

#### Question and Answer Period (all participants)

Following the knowledge user presentations, meeting participants were invited to approach the panel with specific questions. A summary of the resulting discussion follows below.

There is a need for improved data collection on ethnicity and cannabis use. While some immigration data can be used as a proxy for ethnicity and some information exists via police reports, it is a cumbersome process to collect this data. Currently, Statistics Canada's cannabis surveys do not capture ethnicity data.

There has been pushback from communities to prove that cannabis smoke is as unhealthy as tobacco smoke, despite the fact that the constituent ingredients are similar. Community perception and tolerance will often drive the implementation of regulations and bylaws, therefore pushback with respect to restrictive cannabis laws leads to a desire for cannabis-specific data to support evidence-based policy.

## Session 2: Priority Populations

---

This session included five research presentations and a knowledge user panel discussion relating to priority populations.

### Targeted Cannabis Prevention for Youth at High-Risk for Psychosis

*Presented by: Patricia Conrod and Josiane Bourque, Université de Montréal*

Dr. Conrod and Ms. Bourque co-presented their project, which focused on cannabis use among youth at high risk of developing psychosis, and targeted drug-prevention strategies for these individuals.

Psychotic disorders are not very prevalent, but have been found to be more strongly associated with cannabis use than other mental illnesses, including depression. Youth who begin using cannabis at an early age, those who use cannabis heavily, and youth who have sub-clinical psychosis symptoms are at elevated risk for psychosis.

In the general population of high school youth, cannabis use was predictive of psychotic symptoms within a 12-month period. This relationship was shown every year over the course of adolescence.

When looking at longitudinal data, the researchers found that youth who use cannabis and alcohol specifically to cope with depression were at higher risk for psychosis. These youth were also found to be at risk for more general psychological symptoms a year later, and throughout high school. An explanation for this relationship could be that depression is a mediating factor between cannabis and psychosis. For example, internalizing symptoms may lead to poor coping strategies (including cannabis and other substance use). These poor coping strategies combined with hostile thoughts were predictive of psychotic symptoms.

With a better understanding of the co-evolution of cognitive and behavioural risk factors among at-risk youth, the researchers were able to adapt school-based psychological interventions to more specifically target youth at risk for psychosis. Dr. Conrod and her team are conducting focus groups with high-risk youth to better understand triggers and cognitive processes linked to cannabis use motives and psychosis-like thinking. Testimonials from these interviews are being incorporated into cognitive-behavioural intervention manuals to be able to expand an existing drug-prevention program (Preventure), which has demonstrated effectiveness in reducing alcohol and cannabis use, so that it more specifically targets youth at risk of psychosis. This catalyst grant supported a pilot study of the acceptability and feasibility of targeting cannabis and psychosis risk in brief cognitive-behavioural interventions with at risk youth.

## Development of a Canadian Youth Cannabis Survey: Understanding Changing Aspects of Cannabis Use Among Young Canadians

*Presented by: Martin Cooke, University of Waterloo*

Dr. Cooke highlighted the need for improved surveillance data on cannabis use among young people. Current data focuses on prevalence, but doesn't look at other factors, such as exposure in the home, time and patterns of use, susceptibility to use, etc. This study aimed to fill two gaps: Use existing data sources to create comprehensive baseline trends, and develop a new survey to augment current data collections and measure additional aspects of cannabis use among youth.

Baseline data reports have been created by using national surveillance surveys and trends. The research team is working with CCSA to develop fact sheets based on the best-available data. These will be available soon.

The researchers identified the following survey recommendations: Use an in-classroom pencil and paper survey for students in grades seven through 12 (online methods are difficult to execute in classrooms), ensure the survey could be either stand-alone or modular with other data collection, and use questions that have already been validated by other survey sources. Specific data considerations include: demographics, prevalence, frequency, type/amount of cannabis used, co-use with other substances, sources and cost, reasons for use/non-use, perceived impact of use, perceptions of use, social exposure to cannabis and exposure to messaging such as advertisements or public health education.

The researchers are working with focus groups of students to get feedback on the survey design, define language and select images that are the most impactful.

## Influence of Cannabis Exposure in Pregnancy on Offspring Perinatal and Childhood Health Outcomes: A Population-Based Birth Cohort

*Presented by: Daniel Corsi, Ottawa Hospital Research Institute*

Dr. Corsi analyzed perinatal data from Ontario collected between 2007 and 2017 (pre-legalization) to investigate trends in cannabis use and pregnancy and associations with adverse maternal, perinatal and child neurodevelopmental outcomes.

Results indicated that between 2012 and 2017, 1.4% of women self-reported cannabis use at some point during pregnancy, and between 2007 and 2012, 0.6% self-reported cannabis use. Polysubstance use was common, including smoking (78%), drinking (4%), and other drugs (39%). Cannabis use was associated with pre-term birth, small for gestational age, placental abruption, transfer to neonatal intensive care, and five-minute APGAR score <4. When looking at child neurodevelopmental outcomes, prenatal cannabis exposure was associated with autism spectrum disorder, learning disabilities and attention deficit disorders.

The researchers found that cannabis use in pregnancy has increased over time, and is highest among younger mothers (15-24 years; 5-6% prevalence) and low-income mothers (2-3% prevalence).



These results suggest that pregnancy represents a window of opportunity for targeted resources, including education. These findings may be particularly important for high-risk groups such as young and low-income mothers. Further study is needed on the amount and timing of cannabis use during pregnancy, particularly post-legalization where cannabis use may increase (e.g. due to self-medication for nausea).

### **Trajectories of Marijuana Use Across a Decade: Their Predictors in Adolescence and Impact on Health, Academic, Social, and Economic Outcomes in Young Adulthood**

*Presented by: Bonnie Leadbeater, University of Victoria*

Dr. Leadbeater discussed patterns of cannabis use among Canadian adolescents between 2003 and 2013, who are among the youngest and most frequent users of cannabis in the developed world. Her study found that 28% of youth between 11–15 years old had used cannabis in the last year. Youth who first used cannabis at age 13 had a strong association with problems later in life.

She identified five different patterns of use from adolescence to young adulthood: *Increasers* (start low and increase rapidly to more than one time/week and then slowly decline), *Decreasers* (use heavily in adolescence and then steadily decrease over time), *Occasional users* (a few times a year to a few times a month), *Chronic users* (start early and use often; more than once a week at all ages), *Abstainers* (no use). *Increasers* and *chronic users* were more likely to be male, had an average first age of use of 13, had symptoms of addiction, physical health and externalizing problems, sleeping problems, poorer education/work/ relationships and poor eating habits.

Dr. Leadbeater also looked at patterns of co-use of cannabis and alcohol. Most individuals who use cannabis started before age 18, 99% of individuals who use cannabis also used alcohol, and 41% of those that used both cannabis and alcohol, used them within one hour of each other (simultaneous use). Simultaneous use was associated with higher risks than one substance on its own.

Finally, it was noted that working in a traditionally male-dominated occupation was predictive of substance use.

### **Impact of Cannabis Legalization on Cannabis Use and Outcomes in Patients with Opioid Use Disorder: A Canadian Prospective Cohort Study**

*Presented by: Lehana Thabane, McMaster University*

On behalf of his team (Zainab Samaan, Tea Rosic, Nitika Sanger, David Marsh, James MacKillop, Lehana Thabane, Alannah Hillmer, Jackie Hudson), Dr. Thabane presented their study looking at the association between cannabis use and illicit opioid use among patients undergoing treatment for opioid use disorder pre- and post-legalization.

Individuals with psychiatric disorders, including substance use disorder, use cannabis more frequently than the general population. They also have higher prevalence of cannabis use disorder, which impacts their prognosis and treatment outcomes. Everyday cannabis use seemed to increase after legalization, but not by much, and a large number of people were still buying cannabis on the street rather than from a legal retailer. Approximately 50% of individuals using cannabis did not know the brand or strain that they were using.

With respect to patients with opioid use disorder, opioid use pre- and post- cannabis legalization was comparable, but there are still many unknowns. Some differences were noted in the frequency of use, source, and method of consumption.

Future analyses will look at sex and gender effects pre- and post-legalization, as well as associations with other substances, associations with illicit drug use and patterns with urine drug screens. The researchers noted that surveillance of individuals with opioid use disorder is needed in the context of cannabis legalization (harms/benefits).

### Knowledge User's Perspective and Panel Discussion

In this section, knowledge users presented their perspectives on the five research projects that were presented in Session Two. Meeting participants were then invited to ask questions and a group discussion followed.

The panel was moderated by Kira London-Nadeau, from the Canadian Students for Sensible Drug Policy. Ms. London-Nadeau opened the panel by stressing the importance of youth involvement in cannabis research, knowledge translation and knowledge dissemination.

#### Helen Hsu, Brockville General Hospital

Dr. Hsu emphasized the value of clinical perspectives to identify knowledge gaps. For example, in her practice, women are consulting the internet for advice on how cannabis can be used to treat pregnancy-related nausea. This is a clear gap where evidence-based messaging is needed to inform women about the risks of cannabis use during pregnancy. Data on outcomes related to prenatal cannabis use is needed to educate both patients and clinicians and to counter misleading messaging that is not being informed by research.

#### Richard Stanwick, Island Health

Dr. Stanwick spoke about the accessibility and prevalence of cannabis use among youth in BC, stating that more youth have experimented with cannabis than tobacco. While progress is being made on collecting and disseminating data on youth drug use, it must be available faster. Working upstream is needed in order to identify youth at risk before dependency, particularly by using interventions in schools before students graduate and become less accessible.

Dr. Stanwick cautioned that policy makers and researchers could be underestimating the impact of edible cannabis if industry will be allowed to roll out various products without sufficient oversight.

#### Jasmine Fournier, Thunderbird Partnership Foundation

Ms. Fournier brought an Indigenous perspective to the discussion and encouraged workshop participants to think about how they can improve relationships with Indigenous groups. There are 133 First Nations in Ontario alone; engagement activities must be community-specific rather than one-size-fits-all. In addition, more work needs to be done to identify communities' needs and to empower communities, and the focus should be on mental wellness (strengths rather than deficits), particularly among youth.

### Frank Crichlow, Canadian Association of People who use Drugs

Mr. Crichlow spoke on behalf of people with living experience and reminded participants that the consequences of criminalization disproportionately impact marginalized groups, especially black, Indigenous and other racialized groups. Although cannabis is now legal, many people remain incarcerated for cannabis offences and pardons are needed and overdue for these individuals.

### Question and Answer Period (all participants)

Following the knowledge user presentations, meeting participants were invited to approach the panel with specific questions. A summary of the resulting discussion follows below.

Working with Indigenous youth and Indigenous communities needs to be viewed more broadly, not simply in terms of marginalization. There is a bi-directional process for working with Indigenous communities (for reference see work published by Christopher Mushquash, Lakehead University). It is important that data measures work for the community, the context is captured appropriately, a whole-community approach is followed, and intervention materials are adapted as necessary. This process requires time and care in order to result in better-informed products and outcomes.

Finding quality, evidence-informed information related to cannabis is currently difficult, and harmful misinformation is easily available. Canadians want authoritative information related to cannabis and if healthcare providers are not speaking to their patients about cannabis, patients are likely to seek advice elsewhere. New, evidence-informed messaging is crucial and is urgently needed. Caution is required to avoid stigmatization, especially among vulnerable populations. For example, pregnant women are highly stigmatized and public health advertising regarding cannabis use in pregnancy could increase this stigma.

## Session 3: Impairment

---

This session included three research presentations and a knowledge user panel discussion related to cannabis impairment.

### Perceptions and Characteristics of Individuals who Drive Under the Influence of Cannabis

*Presented by: Jorge Flores Aranda, Université de Sherbrooke*

On behalf of Principal Investigator Dr. Christophe Huynh, Dr. Flores Aranda presented their study highlighting concerns about higher rates of driving under the influence of cannabis following legalization. Cannabis is known to reduce cognitive and psychomotor abilities and the presence of THC is associated with a high risk of road accidents. This study surveyed Canadians 17 to 35 years old who have a driver's licence and have used cannabis in the past 12 months to determine the factors that influence young Canadians to drive under the influence.

Preliminary analyses found that 54% of participants have driven under the influence of cannabis, 9% under the influence of cannabis and alcohol, and 3% under the influence of alcohol only. Of those who reported driving under the influence, 66% were males, 90% used cannabis at least once a week and more than 50% met criteria for cannabis use disorder.

This sub-population had a number of other characteristics including: They were regular drivers, were more likely to be impulsive or to display risky driving behaviour such as speeding, had negative perceptions of public transportation, had less knowledge about the legal repercussions of driving under the influence, were less likely to believe that cannabis impairment could be detected and they perceived driving under the influence of cannabis as a low-risk activity.

Prevention messages are needed to reduce risks associated with driving under the influence of cannabis. In particular, messaging related to the legal repercussions, safety risks, promotion of alternative transportation options and to question one's subjective perception of intoxication.

### Towards Monitoring of Driving while Impaired by Cannabis and/or Other Drugs

*Presented by: Marie Claude Ouimet, Université de Sherbrooke*

Dr. Ouimet discussed the issue of driving while impaired by cannabis. In order to achieve a good understanding of the situation, there is a need to monitor negative consequences associated with impaired driving by cannabis such as crashes, arrests and convictions, as well as other variables that might help explain changes in these consequences (e.g., successful prosecution). Although some of these data are already contained in established data platforms, there are likely additional variables that are not being collected.

With 23 organizations currently recruited, this study will identify data indicators that are needed, and processes by which they can be collected in order to inform the development of a monitoring strategy for cannabis-impaired driving.

## Taking 9 to 5? Clearing the Haze on Cannabis Consumption in the Canadian Workplace

*Presented by: Nancy Carnide, Institute for Work and Health*

Dr. Carnide described the findings of a pre-legalization survey study of Canadian workers aimed at understanding patterns of cannabis use, as well as perceptions and knowledge gaps related to cannabis use in the workplace. She noted that workers are a population subgroup to consider with respect to understanding the potential impact of cannabis legalization on workplaces and the need for educational programs in order to mitigate occupational risk.

This study found that 30% of workers surveyed used cannabis in the past year, for a mix of non-medical (relaxation, feeling good, special occasions) and medical (sleep, pain, stress, anxiety) purposes. Some reported their reasons for cannabis use were specifically related to their work (e.g., managing stress, pain relief). Among workers who reported using cannabis in the past year, approximately a quarter reported using it before/during work. Most workers felt that consuming cannabis at work was risky, although they felt that cannabis use two hours prior to work was less risky. Some workers reported that they felt cannabis helped them at work.

Dr. Carnide identified knowledge gaps with respect to understanding substance use policies in workplaces, the timing of effects after cannabis consumption (particularly for edible cannabis), and the THC content of cannabis being consumed. There is a need for guidance to inform both employers and employees on cannabis use in the workplace.

### Knowledge User's Perspective and Panel Discussion

In this section, knowledge users presented their perspectives on the three research projects that were presented in Session Three. Meeting participants were then invited to ask questions and a group discussion followed.

The panel was moderated by Karen Koundakjian from Public Safety Canada. Dr. Koundakjian opened the panel by highlighting the importance of having baseline data in order to measure the impact of policies and programs. She also noted that observing US jurisdictions may be useful to inform sound data and results.

#### Alain Jacques, CIUSSS du Centre-Sud-Ile-de-Montréal

Mr. Jacques spoke about how cannabis legalization might impact impaired driving and the importance of using evidence-informed criteria to measure impairment. Furthermore, data is needed to support impaired driving convictions, as well as to inform criteria for drivers to regain their licence.

Appropriate education tools are also needed for service providers and drivers, who need to understand the effects of cannabis (including CBD) on cognitive functioning (including subjective versus objective experiences of driving), detection of cannabis (e.g. saliva test and criminal implications) and how impairment can change when cannabis is used with alcohol or other substances.

### Daniel Sansfaçon, Public Safety Canada

Dr. Sansfaçon highlighted concerns with drug impaired driving data. Bill C-46 made reforms to alcohol- and drug-impaired driving, giving police new tools to detect and charge drivers, and providing funds to support activities such as enhanced law enforcement training and data collection, with the expectation that data will be collated and used to report on national standardized indicators of drug-impaired driving. Unfortunately, there is a disconnect between the new reporting requirements and currently available data. There are significant gaps in the coverage, completeness and reliability of drug-impaired driving data at the national and jurisdictional levels, which is a multi-faceted problem with changes needed at many levels. Collaboration between all jurisdictions, including Statistics Canada and research consortiums, is needed to further develop the set of available data through enhanced law enforcement data collection and implementing new data collection tools.

### Kim Slade, Public Services Health & Safety Association

Ms. Slade spoke about impairment in the workplace and concerns associated with cannabis use in safety sensitive work positions. Employers were not prepared for legalization, may be unsure of their responsibilities with respect to cannabis use in the workplace (including edible cannabis and delayed impairment) and lack tools and information to educate their employees. Employers need help developing policies and procedures relating to cannabis in the workplace.

### Question and Answer Period (all participants)

Following the knowledge user presentations, meeting participants were invited to approach the panel with specific questions. A summary of the resulting discussion follows below.

There is a need to develop an evidence base, and national standards with respect to driving while impaired by cannabis, and to inform processes for individuals regaining their licences (e.g. following up with people who are in this situation). Similar things have been done with respect to professional licences, for example physicians who have lost their licence due to drug use.

Youth are being exposed to alcohol and/or cannabis as passengers in vehicles. Individuals who use cannabis heavily or frequently often believe they have developed a tolerance and are not impaired, however the correlation between self-perceived impairment and cannabis content in the blood is still unclear. There is a need for more evidence about perceptions of impairment and a need to address perceptions of risk as it relates to cannabis use and driving.

Given the evidence on cannabis use in the workplace, it is clear that interventions are needed to address perceptions of workplace safety among individuals that use cannabis.



## Session 4: Stakeholders and Researchers Needs

---

This session featured two presentations providing unique stakeholder perspectives: Cannabis use from the point of view of people who use drugs, and strategies for engaging youth in cannabis research.

A plenary discussion followed in which advice and strategies were provided from the experts in the room in order to highlight current priorities, knowledge gaps and best practices.

### Cannabis Use Disorder and Recovery – An Inside View

*Presented by: Rand Teed, Drug Class Program*

Mr. Teed spoke about cannabis use disorder and recovery. Addressing stigma from both the clinician and patient perspectives is a challenge. Clinicians may have a generalized stigma that relates to all substance use and negates patients' needs, while individuals who use cannabis may feel shame or embarrassment, or they may feel that cannabis use is not a serious problem. Reducing stigma on both sides may encourage individuals who use cannabis to seek help.

Early intervention is key with cannabis use disorder, although drug use often is not addressed until patients hit rock bottom. It is important to view substance use as a spectrum and watch for early signs and symptoms. People with substance use disorders need to know that their recovery is supported and encouraged. Additionally, treatment for substance use disorders should be considered critically necessary for the health of the individual, similar to treatment for any other disease. Mr. Teed noted that in many cases, individuals are using a substance to compensate for a basic need that is not being met elsewhere. He suggested viewing substance use not necessarily as a problem, but as a symptom – patients may be using cannabis because it eases a hurt or concern.

Clinicians need more training and tools to support people with substance use disorders. Some important elements of recovery that were highlighted included: regaining social connections, addressing underlying issues that may have led to substance use in the first place, preparing patients for withdrawal symptoms (including emotional responses such as feelings of vulnerability), meditation, nutrition, exercise, therapy, and reconnecting patients with activities that they once enjoyed.

## Youth Engagement in Research Planning, Design and Evaluation

*Presented by: Lisa D. Hawke & Jacqueline Relihan, Centre for Addiction and Mental Health*

Dr. Hawke and Ms. Relihan spoke about the benefits of including youth in research planning, design and evaluation, as well as strategies for involving youth in meaningful ways. Often overlooked, youth can contribute to research questions, encourage other youth to participate in research, help develop recruitment strategies, support data collection and interpretation, and assist with knowledge translation to other youth by making messaging more youth friendly and relevant. In return, youth benefit from this engagement and report their involvement in research is empowering, helps them develop a variety of skills and provides mentorship opportunities, compensation, social engagement and long-term citizenship.

Workshop participants were urged to think about how they could engage youth through different types of participation. Some examples included: focus groups, surveys, advisory groups, providing feedback, or contributing to decision making and project development.

As with any stakeholder group, youth engagement takes time. If done properly, incorporating principles of reciprocity and collaboration, engaging youth in research can contribute substantially to a better process and final product. Some tips for youth engagement include: provide compensation, explain how they will benefit from participation, provide pre- and post-meeting briefs, use youth-friendly language (avoiding jargon and acronyms they may not understand) and remain flexible and open-minded.

Participants were also encouraged to think about the existing body of evidence and how it may be adapted to different audiences and contexts through relevant engagement. The Lower-Risk Use Cannabis Guidelines, an evidence-based public health intervention tool was used as an example of how youth engagement was able to translate research evidence into a youth-friendly resource. The guidelines were made into a colourful, pocket-sized resource (“The Blunt Truth”) that used youth-friendly language to educate and promote informed decision making with respect to cannabis use. This resource was the most purchased item on the CAMH website. A free PDF can be downloaded at: [http://www.camh.ca/-/media/images/all-other-images/research-lrcug-for-youth/lrcug\\_for\\_youth-eng-pdf](http://www.camh.ca/-/media/images/all-other-images/research-lrcug-for-youth/lrcug_for_youth-eng-pdf)

The Youth Engagement Guidebook for Researchers can be downloaded at:

<https://is.gd/INNOVATEResearchGuidebook>

### Plenary Discussion

Dr. Samuel Weiss facilitated a final plenary discussion, summarizing key findings and knowledge gaps that were presented throughout the day. Meeting participants were encouraged to share their thoughts. A summary of the discussion, organized around topical subheadings follows below.

#### Cannabis and Youth

Not only is there great value in engaging youth in research, but researchers, government and other stakeholders also have an obligation to ensure that scientific evidence is disseminated in a way that is accessible to youth populations. While involving youth in research projects can be more challenging and time consuming, their involvement enriches the project and enhances knowledge translation and dissemination.

Many psychiatric disorders have their roots in adolescence, and the risks of adolescent cannabis use need to be appropriately communicated to youth. When it comes to this vulnerable population, prevention is important, but effective prevention methods are not well understood. Previous work on alcohol and tobacco has shown that school-based prevention programs are ineffective, demonstrating a need for targeted new approaches relating to cannabis use.

### Cannabis Consumption Behaviours

There is a need for new research to address how cannabis legalization has changed consumption behaviours in Canada. Cannabis is being substituted for other substances (e.g. alcohol), and cannabis is being used together with other substances. This is likely to become further amplified with the introduction of edible cannabis to the legal market. Public health messaging is incredibly important to inform a potentially naïve population.

There are risks associated with cannabis use during pregnancy and lactation, however there is a lack of accurate, authoritative information to inform pregnant and breastfeeding mothers. Evidence-based health information needs to be communicated to the public from reliable and trustworthy sources.

### Cannabis and Perceived Risk

The impact of cannabis impairment as it relates to driving and use in the workplace is very important. Early research shows that some individuals who use cannabis do not feel that driving or working under the influence of cannabis is risky. There is a need for data regarding the sensory effects of cannabis use, as well as tailored messaging to appropriately communicate risks to individuals who use cannabis as well as employers.

### Potential Biases in Baseline Cannabis Use Data

There may be an inherent bias with respect to baseline information for cannabis use pre- and post-legalization. Self-report surveys may under-represent cannabis use pre-legalization. It is likely that survey data post-legalization is more reflective of actual consumption because individuals who use cannabis are more likely to be honest when filling out surveys, and reporting to poison control centres and health care providers is also likely to be higher post-legalization. Looking at changes in consumption two years post-legalization compared to four years post-legalization may be a more effective method of gathering baseline data.

## Conclusion

---

Following the presentations of the 14 funded catalyst projects and subsequent knowledge user panels and group discussions, it is clear that more research is needed to allow Canadians to make informed decisions on cannabis throughout their lives. In particular, there is an urgent need for data on the risks of cannabis use and driving, use in the workplace, use during pregnancy and breastfeeding, and cannabis use in youth populations, particularly those at risk of mental illness.

It is important to consider Canada's diversity and to include knowledge users and people with lived and living experience in research projects. This includes appropriate consideration of cultural and social diversity, sex and gender, and including Indigenous and racialized communities in cannabis research. There are equity issues that need to be addressed, as some groups may be disproportionately affected by aspects of legalization and regulation.

Finally, evidence-informed policies and reliable, trustworthy messaging related to cannabis use are needed for all Canadians. Community-based dissemination strategies may be more effective than federal top-down approaches to ensure that knowledge gets to the people who need it.

# Appendices

---

Please contact the [CIHR Contact Centre](#) to review the full workshop meeting book.