

Cannabis legalization and its impact on indigenous communities in Alberta

Dr. Ellina Lytvyak, MD, PhD
R2, Public Health and Preventive Medicine
University of Alberta



Disclosure



I declare no financial interest, affiliation or any other conflicts of interest with respect to the content of this presentation or any material I will discuss



I have received no support or commercial funding for this presentation, or for any products mentioned herein

Objectives



Review medical aspects of cannabis use:

- Discuss cannabis basics
- Outline the short- and long-term effects of cannabis
- Review the use of medical cannabis



Summarize information regarding cannabis use among indigenous people in Canada



Review legal considerations of cannabis use:

- Explain possession and use of cannabis regulations
- Discuss cannabis use by healthcare professionals



Provide information on reliable cannabis resources

History of cannabis use

2737 BC

PEN TS'AO CHING

World's oldest pharmacopoeia

Earliest record of cannabis as a medicinal drug.

Emperor Shen-Nung recognized its treatment properties for over 100 ailments such as gout, rheumatism, and malaria.

1025 AD

AVICENNA

Medieval Persian medical writer

Publishes "Avicenna's Canon of Medicine", stating cannabis as an effective treatment of gout, edema, infectious wounds, and severe headaches.

Avicenna's work was widely studied from 13th to 19th century, having a lasting impact on Western medicine.

1908

THE OPIUM ACT

Banned the use and sales of cannabis in Canada.

2000-2018

MAKING CANNABIS LEGAL



4000 BC

PAN-P'O VILLAGE

Cannabis cultivation

Cannabis was regarded among "five grains" and farmed as a major food crop.

Other major roles are the production of textiles, rope, paper, and oil.

2000-1000 BC

ATHARVA VEDA

Hindu religious texts

Cannabis is described as a "source of happiness", "joy-giver", and "bringer of freedom".

Cannabis was smoked at daily devotional services and religious rituals.

AYURVEDIC MEDICINE

Open religious use of cannabis allowed for exploration of medical benefits

Used to treat a plethora of ailments: epilepsy, rabies, anxiety, and bronchitis.

Ayurvedic medical traditions also combined cannabis with other herbs.

1900

MEDICAL CANNABIS

Medical cannabis is used to treat nausea, rheumatism, and labor pain

Available as over-the-counter medications: "Piso's cure" and "One day cough cure"

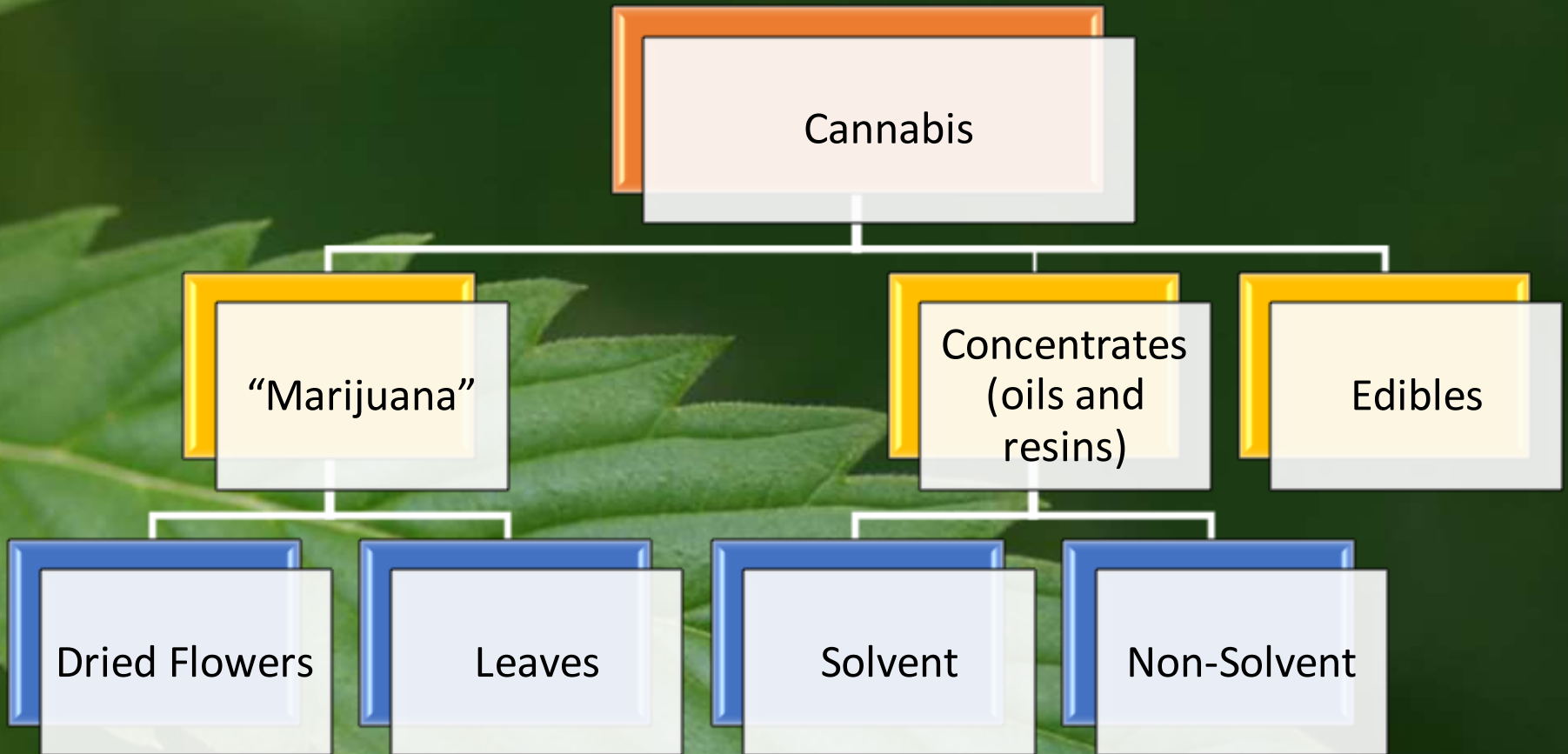
More than 100 papers published on its therapeutic uses.

1964

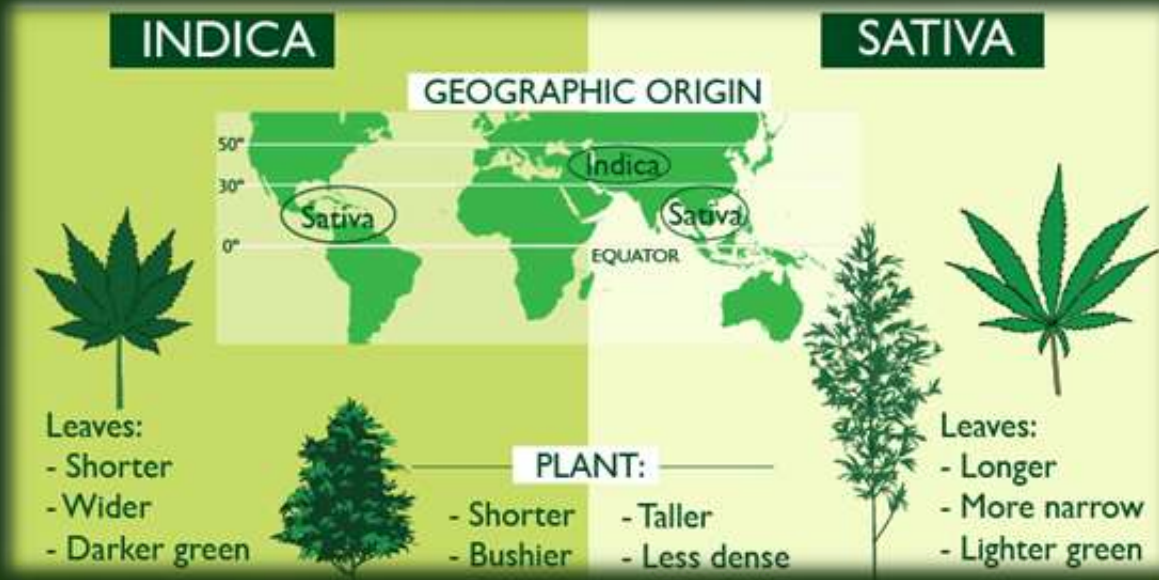
THC DISCOVERED

Molecular structure of THC, an active component of cannabis, is discovered and synthesized by Israeli chemist Dr. Raphael Mechoulam.

Terminology



Terminology



ruderalis



- low in THC
- rarely grown for consumption
- grows well in cold climates
- autoflowering
- up to 5 harvests per year



Terminology

> 100 cannabinoids



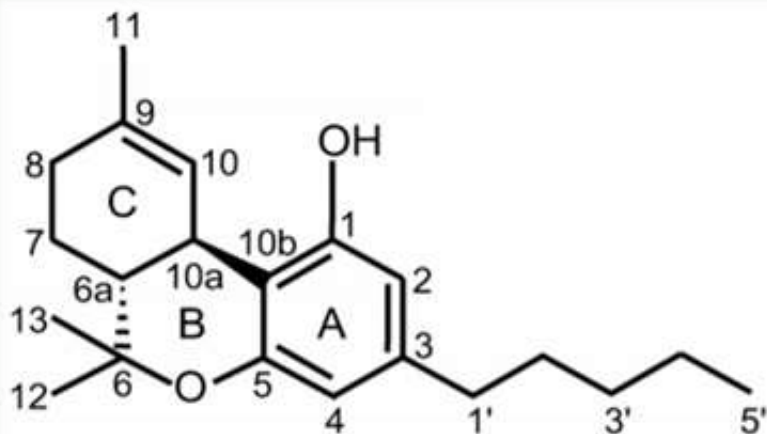
THC

- gives the feeling of being 'high'
- some may feel anxious or paranoid

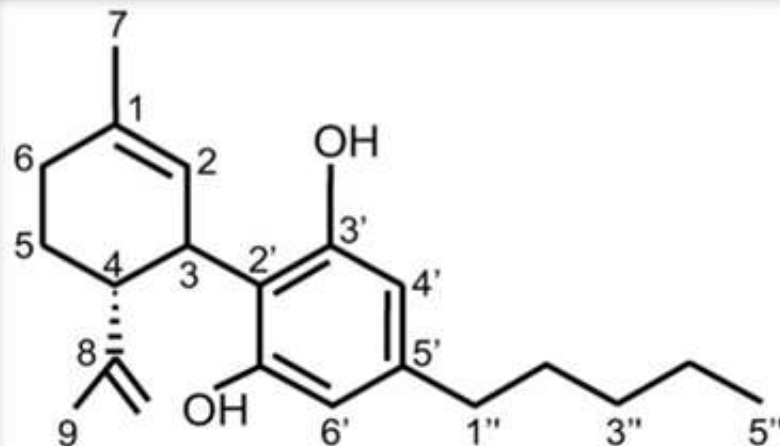


CBD

- may reduce feelings of anxiety
- being studied for medical purposes



Δ 9-tetrahydrocannabinol



cannabidiol;

How is THC metabolized?



Inhalation



10-35% bioavailability after inhaling
Highly variable THC blood levels
50-70% higher bioavailability in regular users

Ingestion

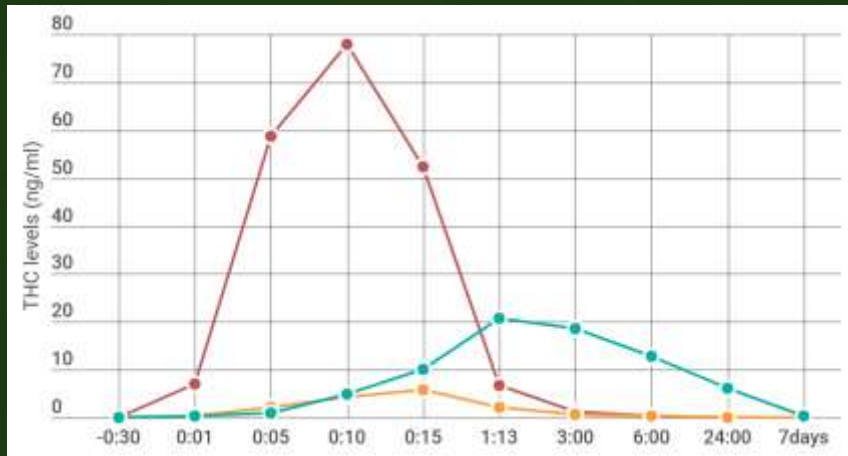


4-12% bioavailability after oral consumption
First-pass effect: stomach absorbs >90% of THC, but the liver eliminates the most even before it gets to the bloodstream
Long time lags in peak concentration between users

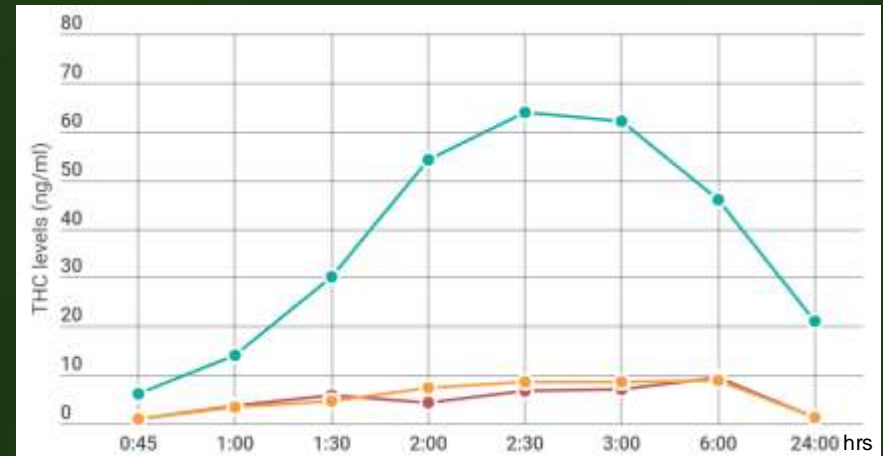
THC effect



Inhalation



Ingestion



● delta-9-THC ● 11-OH-THC ● 11-COOH-THC

THC levels in blood serum after smoking 15.8 mg (1 joint) vs ingesting 20 mg (1 cookie) of delta-9-THC



Quick peak with subsequent fall



Regardless of lower delta-9-THC levels, ingestion produces an intense and long lasting psychological high



Metabolites detectable for at least several days



Delta-9-THC and 1-OH-THC plateau for several hours in the bloodstream

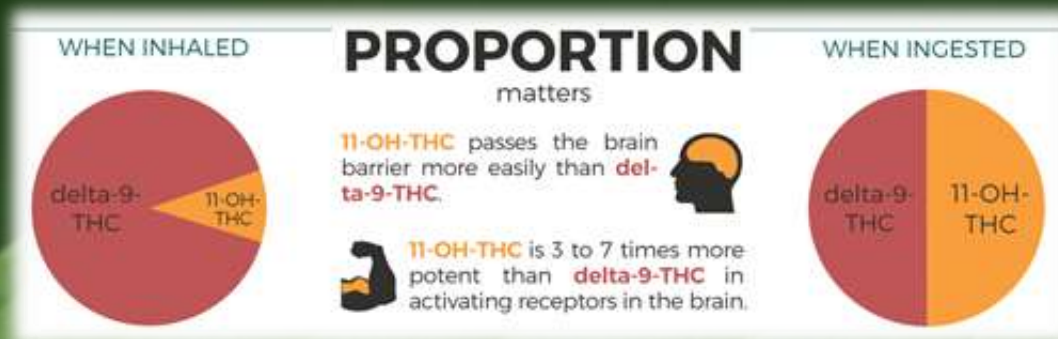
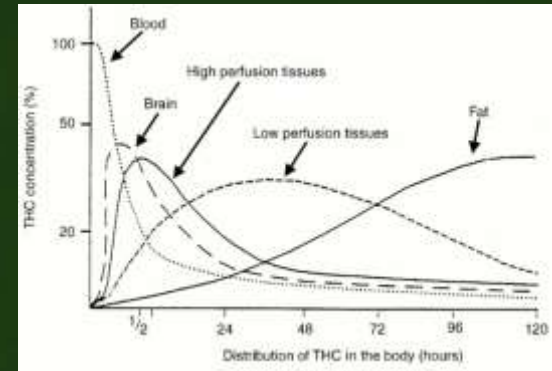
How to measure THC effect?

THC blood levels are not the best indicator for the magnitude of a psychological high:

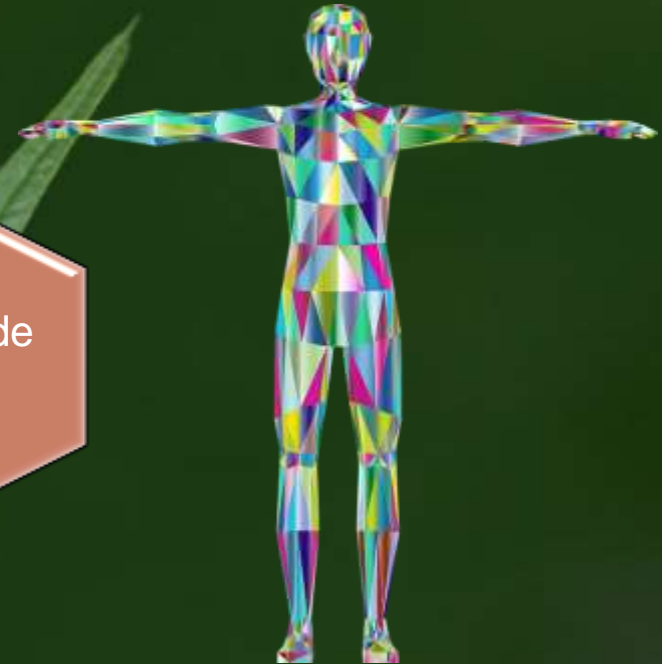
Psychoactive THC binds to CB1 receptors in the brain

THC is highly fat-soluble. It accumulates in fatty tissues and is slowly released into the bloodstream from days to weeks

Depends what metabolite is measured. Studies suggest 11-OH-THC is a primary driver of psychological “high”, despite its smaller quantity



Evidence-Based Adverse Health Effects of Cannabis



Cannabis

short-term effects



Impaired short-term memory, making it difficult to learn and to retain information



Impaired motor coordination, interfering with driving skills and increasing the risk of injuries



Impaired decision-making



Altered judgment, increasing the risk of sexual behaviors that facilitate the transmission of sexually transmitted diseases



In high doses, paranoia and psychosis



Cannabis effect – users feelings

Euphoria

Relaxation

Time-distortion

↑ Appetite and heart rate

Intensification of ordinary experiences

Followed by depressant period

May experience anxiety or paranoia

Bodily effects of Cannabis

Eyes:

- Reddening
- Decreased intra-ocular pressure

Mouth:

- Dryness

Skin:

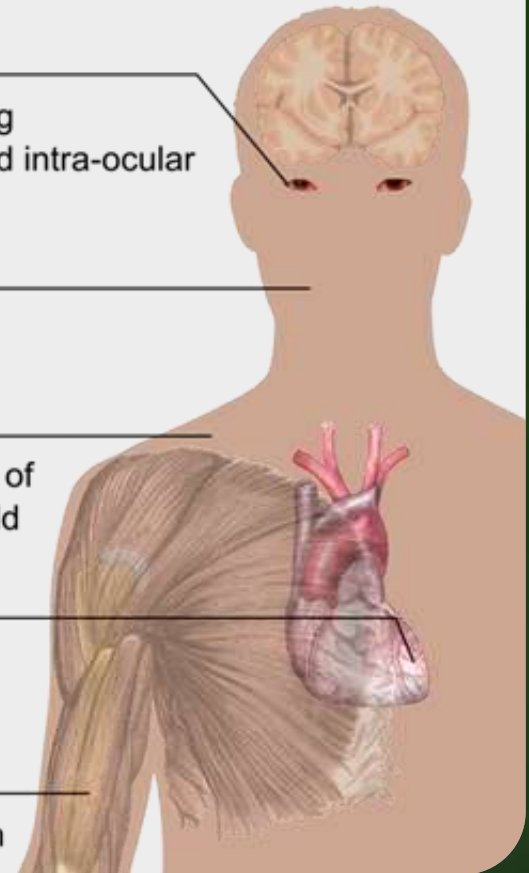
- Sensation of heat or cold

Heart:

- Increased heart rate

Muscles:

- Relaxation



Cannabis

long-term or heavy use effects

Brain health and Mental health



Altered brain development *



Poor educational outcome, with increased likelihood of dropping out of school *



Cognitive impairment, with lower IQ among those who were frequent users during adolescence *



Diminished life satisfaction and achievement (determined on the basis of subjective and objective measures as compared with such ratings in the general population) *



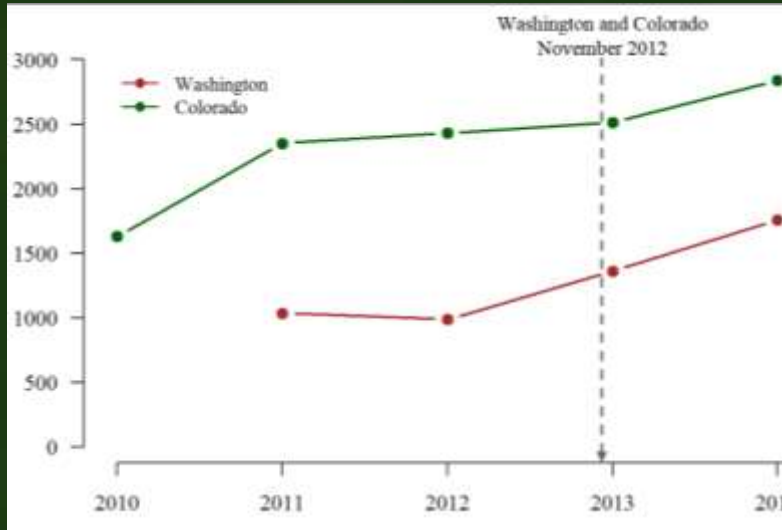
Increased risk of chronic psychosis disorders (including schizophrenia) in persons with a predisposition to such disorders

* The effect is strongly associated with initial marijuana use early in adolescence

Cannabis

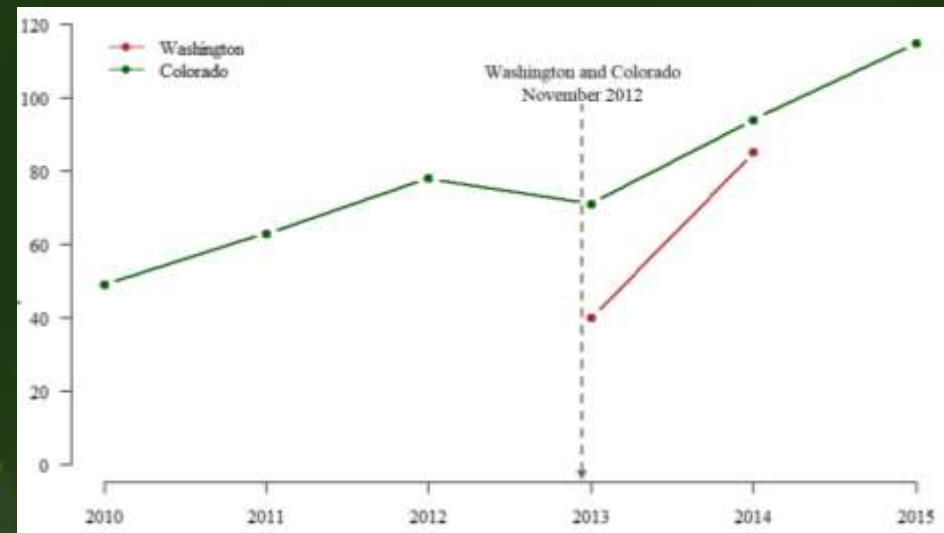
long-term or heavy use effects

Driving



Number of drivers who test positive for THC levels greater than 2ng/mL

The presence of cannabis results in an increased risk of road traffic accidents, likely more than doubling the crash risk

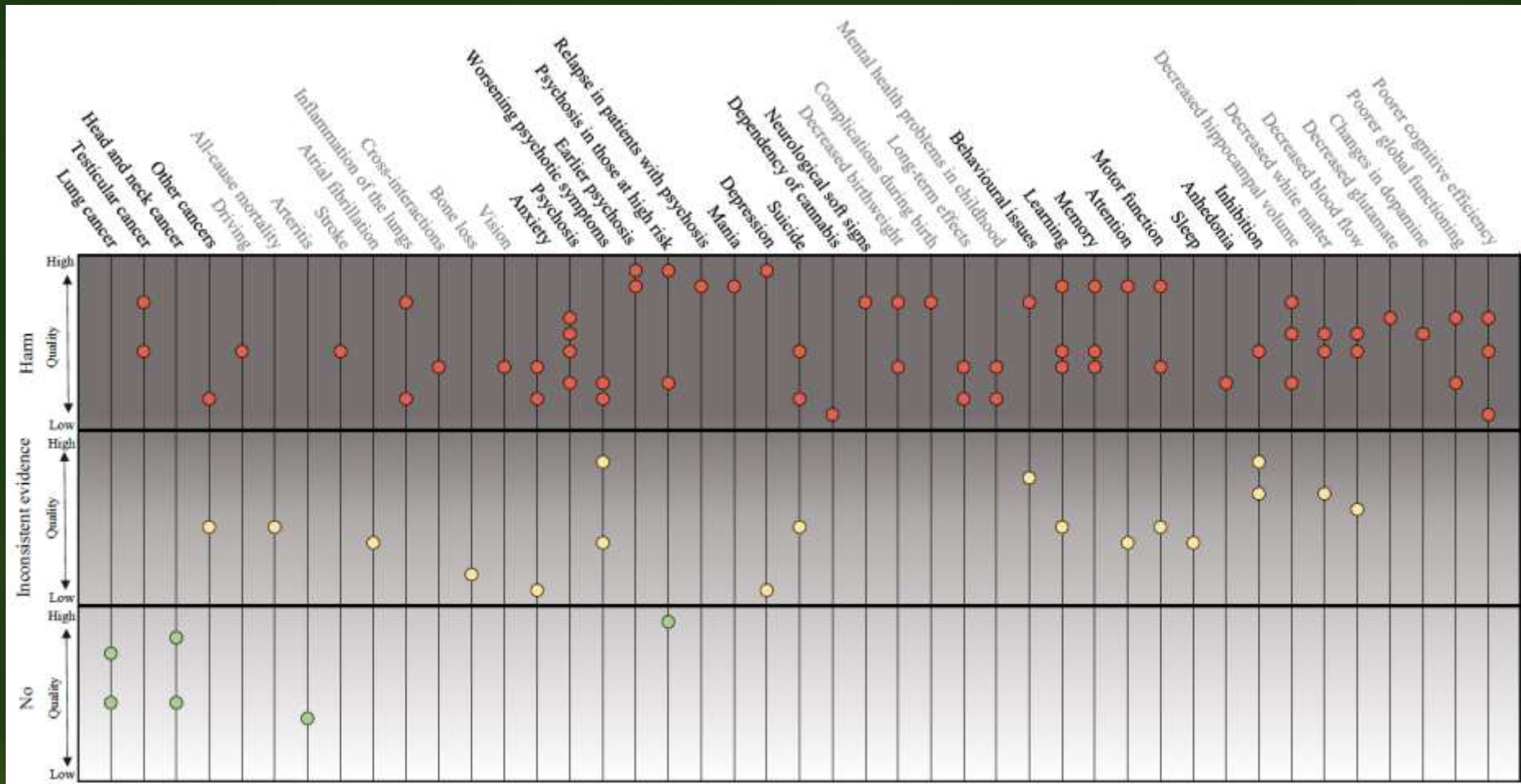


Fatalities with drivers who test positive for THC

Cannabis

long-term or heavy use effects

Summary



Cannabis overdose

Consuming too much cannabis can cause toxic effects

Combining cannabis with other drugs can increase this risk

Signs of cannabis poisoning/toxicity include:

- Changes in heart rate
- Extreme nausea/vomiting
- Anxiety
- Panic attacks or paranoia
- Extreme confusion
- Seizures



Cannabis Hyperemesis Syndrome



Severe and sudden nausea and vomiting



Can lead to dehydration and kidney failure



Associated with frequent, long term use



Can mask surgical emergencies and post-operative complications



Most effective treatment is to stop cannabis use



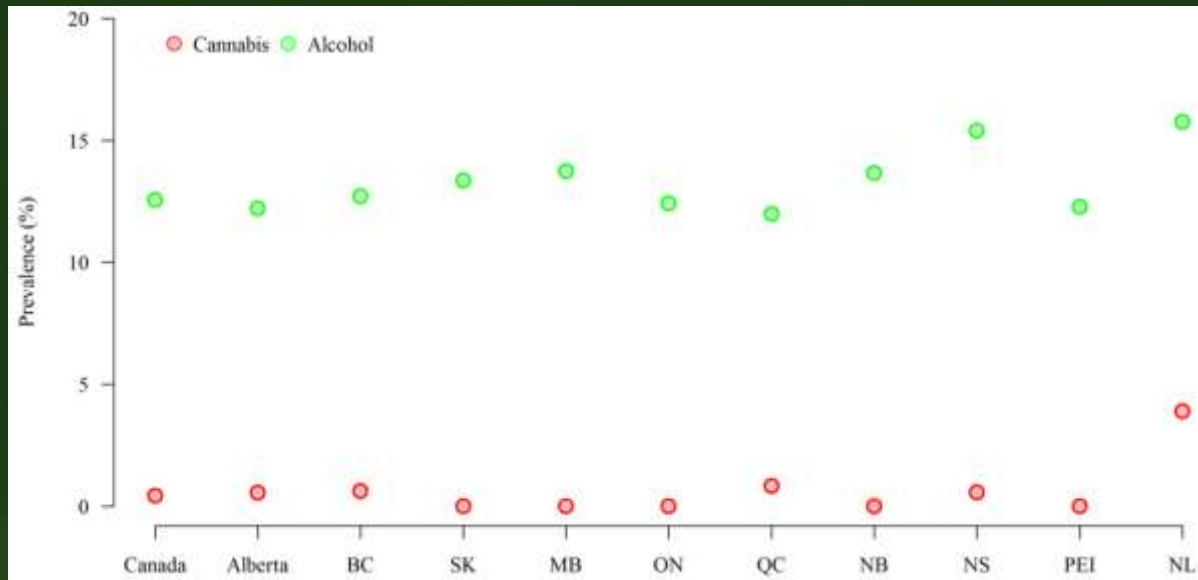
Cannabis dependence

9% of users overall



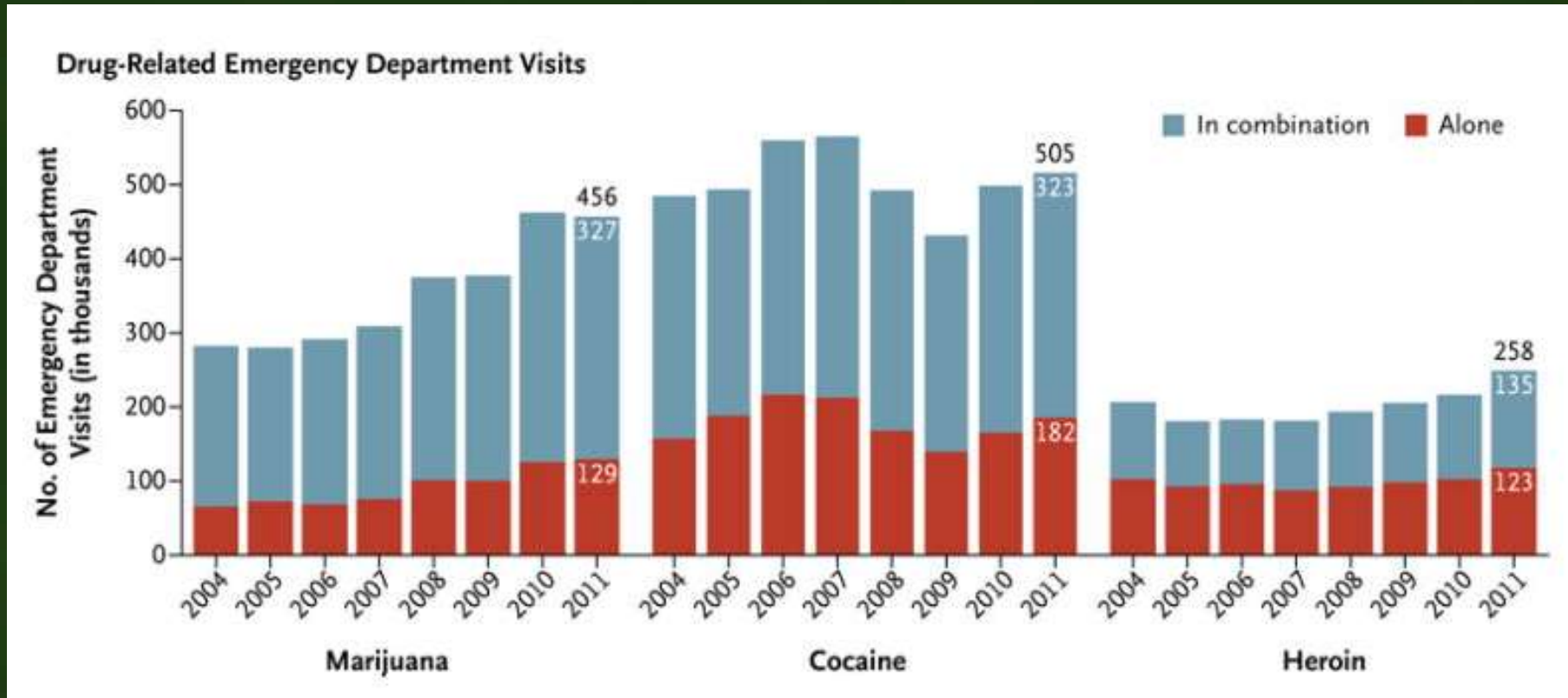
17% of those who begin use in adolescence

25 – 50% of those who are daily users



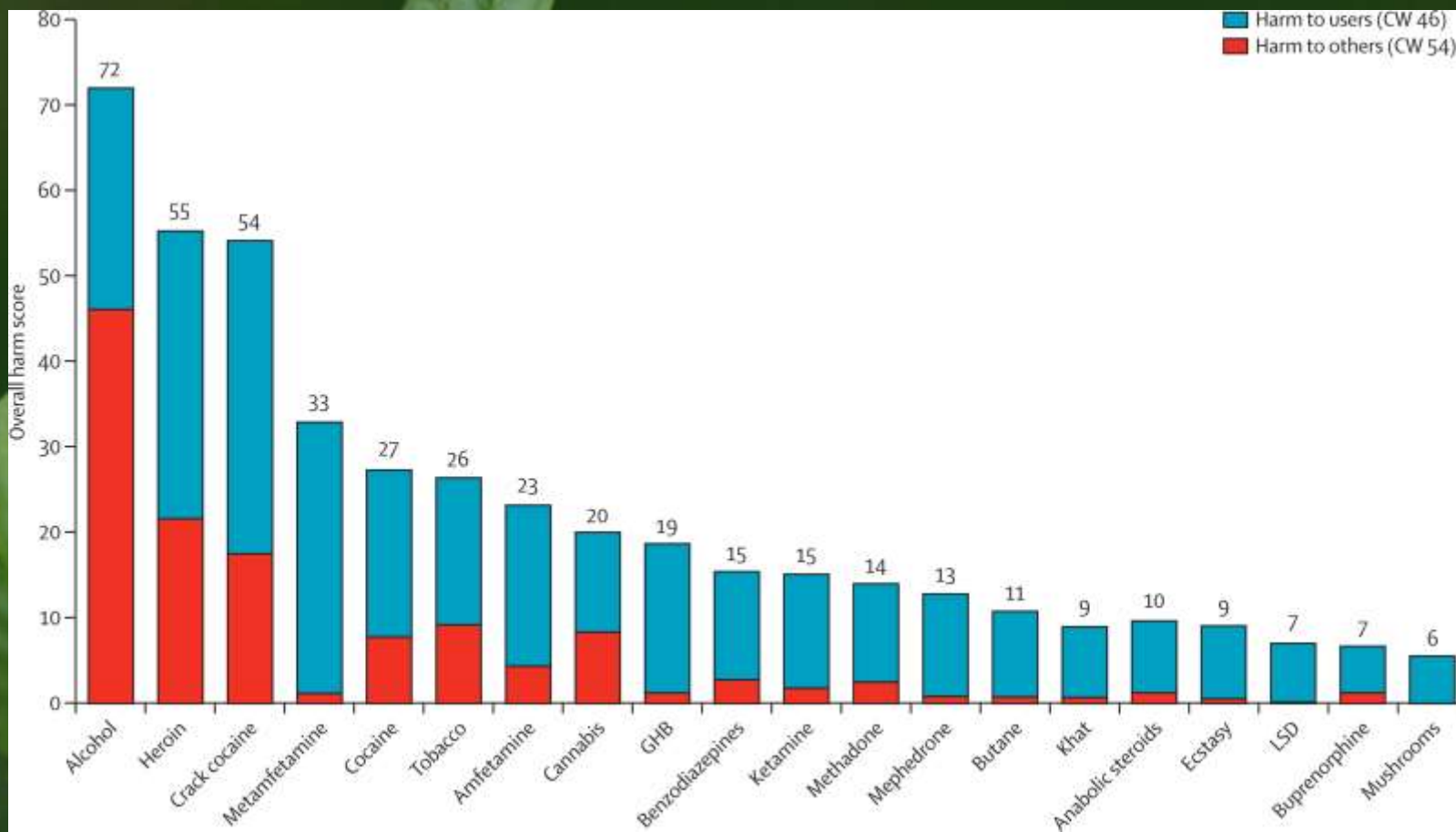
Risk of cannabis or alcohol dependence amongst those who have used in the past 12 months

Cannabis and emergency department use



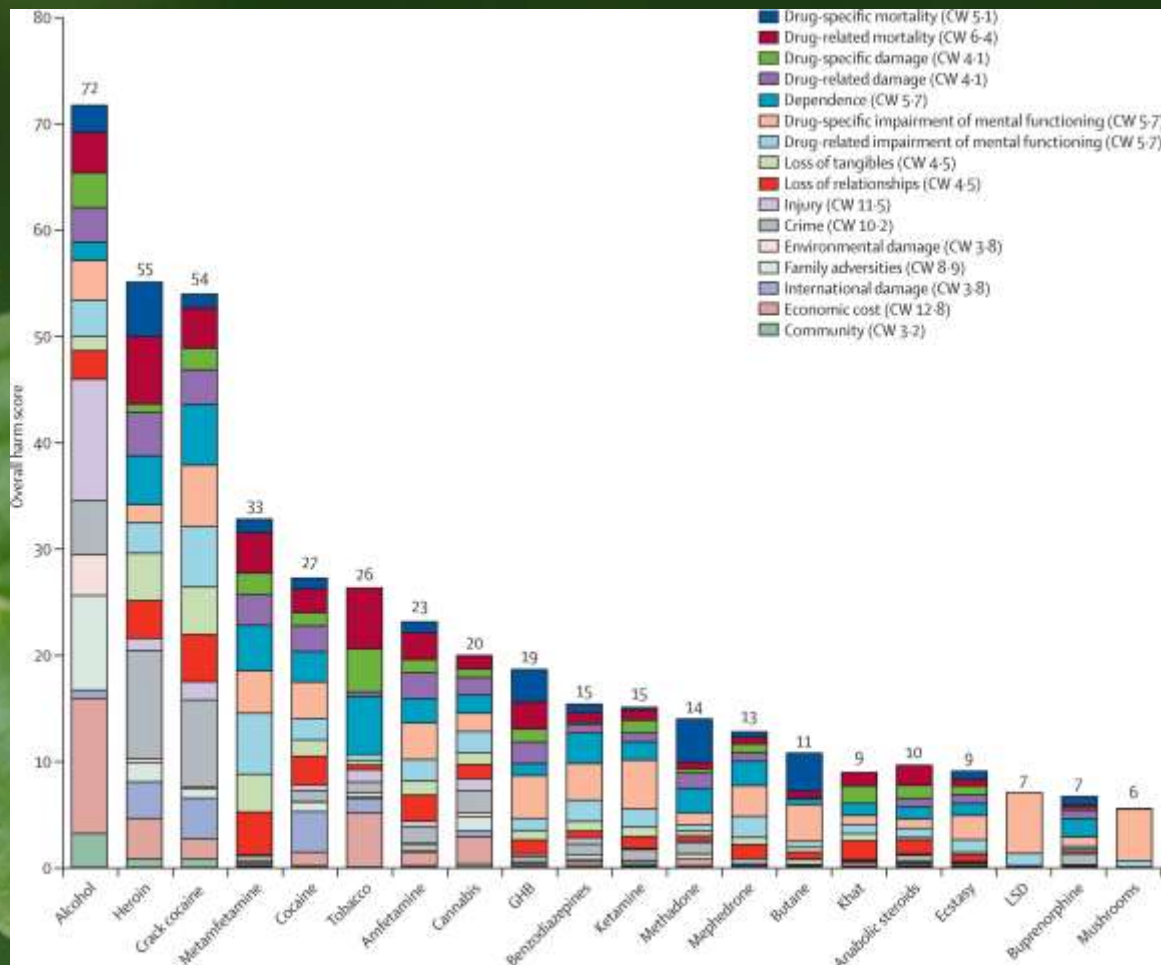
Number of Emergency Department Visits Involving Marijuana, Cocaine, or Heroin, 2004 – 2011, USA

Harm scores for cannabis vs other substances



Drugs ordered by their overall harm scores, showing the separate contributions to the overall scores of harms to users and harm to others, USA

Harm scores for cannabis vs other substances



Overall weighted harm scores for each of the drugs, USA

How is cannabis used?



Inhalation



Oral or Ingestion



Topical

How is cannabis used?

Inhalation

Handheld pipe



Rolling papers



Handheld vaporizer



Water pipe (bong)



Hookah



Vaporizer



How is cannabis used?

Oral or Ingestion

Soda



Candies



Oil



Chocolate



Hard Candy



Tincture



How is cannabis used?

Topical

Body cream



Bath soak



Pleasure oil



Night cream



Salve



Shampoo



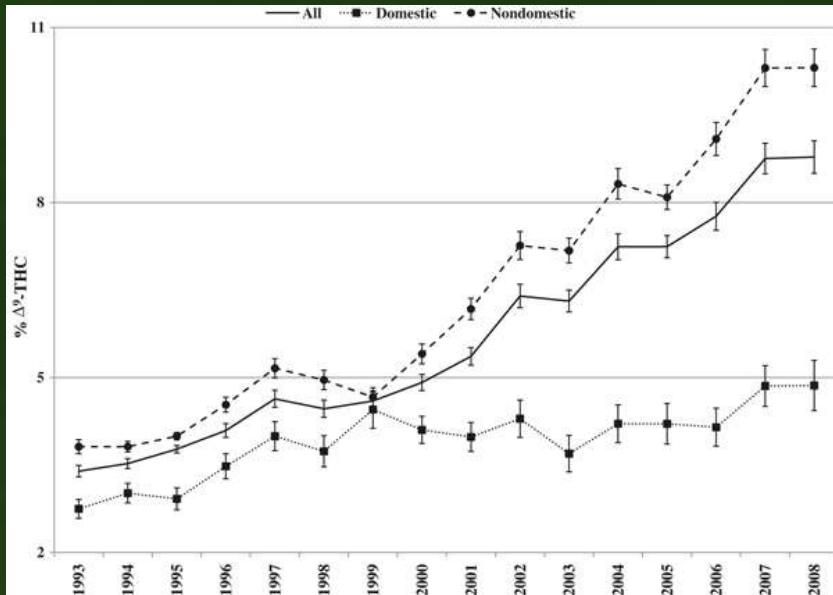
THC potency

Potency is primarily measured by THC content

Potency of cannabis is much greater today than it was 20 y ago

Daily THC consumption in the US has increased by 60x, when compared to 20 y ago

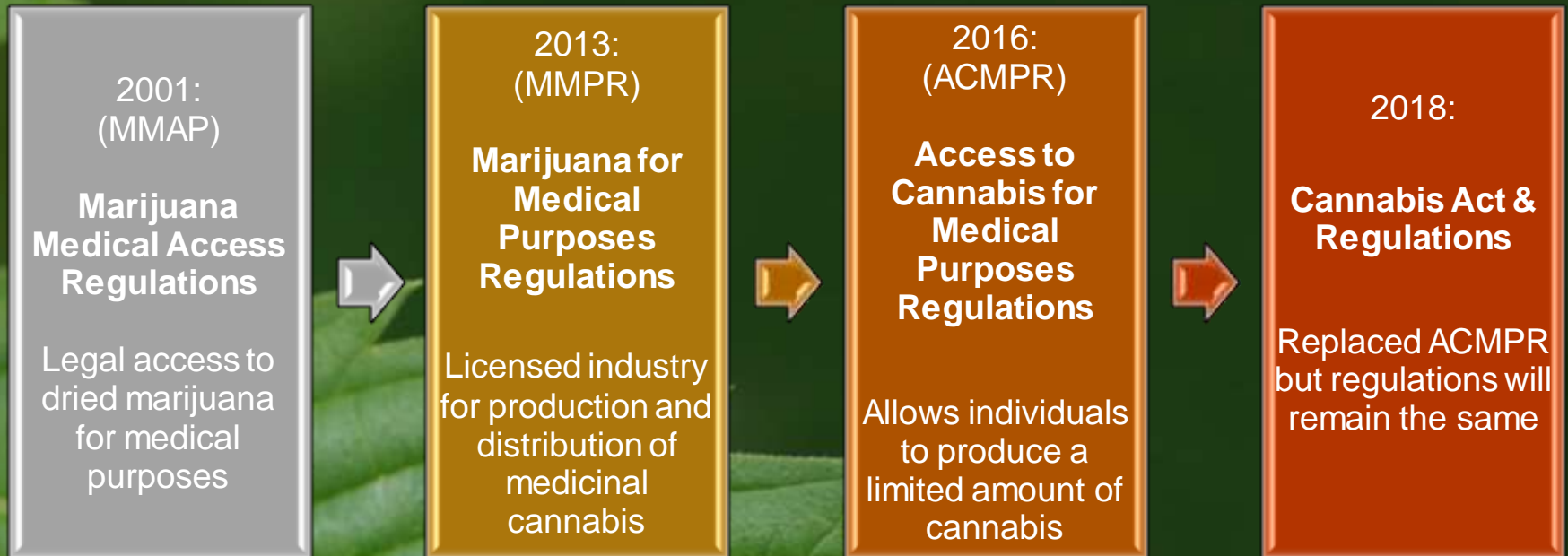
Products containing THC levels higher than 30% (30g THC per mL of oil) are not available in the legally regulated market



Potency trends of $\Delta 9$ -THC
in Confiscated Cannabis Preparations
from 1993 to 2008

Medical cannabis in Canada

Regulations



- Currently, cannabis is not a Health Canada approved therapeutic product
- Does not have Drug Identification Number (DIN)
- However, courts in Canada have ruled that the federal government must provide reasonable access to a legal source of marijuana for medical purposes
- Pharmaceuticals containing cannabinoids (e.g. Sativex and Cesamet) have been approved for specific indications by Health Canada

Medical cannabis in Canada

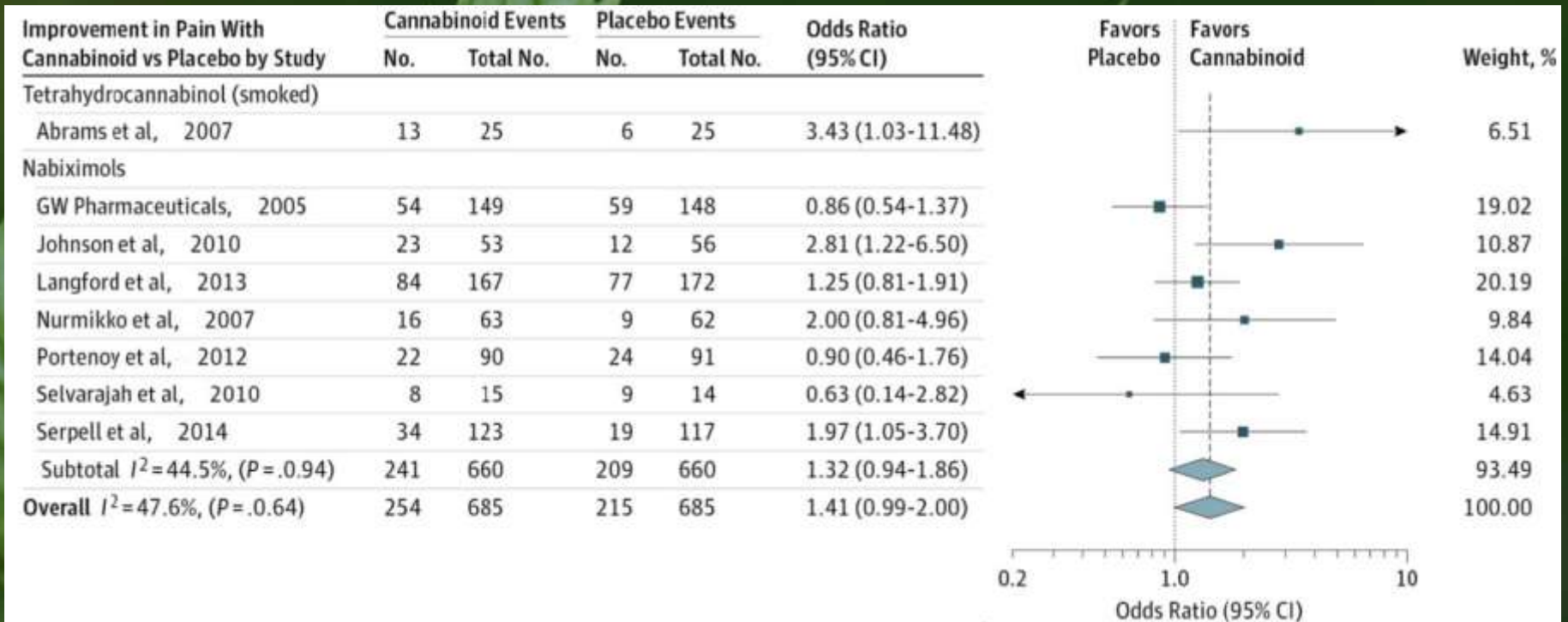
Evidence of benefit and harm

Evidence of Harm	Inconclusive	Evidence of Benefit
<ul style="list-style-type: none">• Depression (high dose THC)	<ul style="list-style-type: none">• Appetite stimulation in HIV/AIDS infection• Anxiety disorders• Glaucoma	<ul style="list-style-type: none">• Nausea and vomiting due to chemotherapy• Chronic Pain• Spasticity due to multiple sclerosis or paraplegia• Sleep disorder• Tourette syndrome

only moderate to very low-quality quality evidence

Medical cannabis in Canada

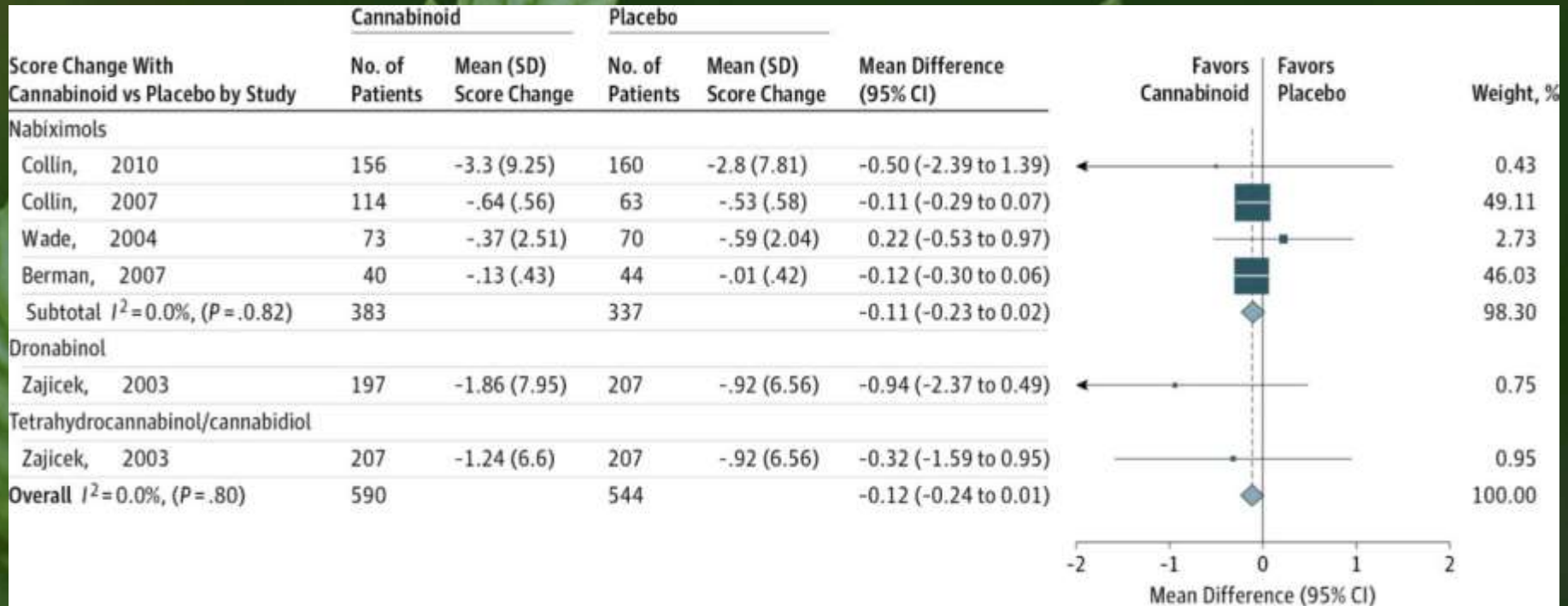
Chronic pain



Chronic pain forest plot comparing cannabinoids versus placebo

Medical cannabis in Canada

Spasticity



Spasticity forest plot comparing cannabinoids versus placebo

Medical cannabis in Canada

Canadian Medical Association Statement



CMA acknowledges suffering of patients in whom conventional therapies are not effective



Concern over serious lack of:

- Clinical trials
- Guidance
- Regulatory oversight




Insufficient information regarding

- Indications for its use
- Therapeutic and toxic dosages
- Knowledge of interactions with medications

Medical cannabis in Canada


Accessibility



Nation-wide, 3% of Canadians report use of cannabis prescribed by a doctor, with most using it once daily



7 clinics in Calgary, 1 in Edmonton and 1 in Medicine Hat



In Alberta, there are 295 physicians authorized to prescribe medical cannabis



There are 5950 patients registered in Alberta



Medical cannabis in Canada

Obtaining

prescription from a HCP (physician or authorized NP)



HCP completes a document outlining the dosage, length of time for which cannabis is needed, and contact information for the HCP and patient



certificate is provided to the patient, who can then submit this to a licensed producer to obtain cannabis plants or seeds



patient must register as a client of a licensed producer and supply medical documentation to that producer



patient can register with Health Canada to grow their own cannabis or designate another person to do so



registration expires when the medical document or registration certificate expires

Medical cannabis

Non-Insured Health Benefits



The NIHB Program has processes and requirements in place before medications are added to the formulary or drug benefit list (DBL)



Medical marijuana does not meet the vast majority of these requirements and there are continuing concerns with the quality of scientific evidence

Requirements

- A drug must be approved by HC under the *Food and Drugs Regulations*, with a NOC and a DIN
- A drug must be prescribed by a licensed practitioner and must be dispensed by a pharmacist
- A drug must be reviewed by CADTH's Common Drug Review process and/or NIHB's expert committee, DTAC
- Monitoring system in place

Cannabis


- There is an authorization process in place to allow individuals to access medical marijuana, but no DIN, NOC
- While there are authorized prescribers, medical marijuana is not dispensed by a pharmacist
- Neither CADTH or DTAC would review because of the lack of high quality evidence and its regulatory status
- No monitoring system exist

Medical cannabis


Private and Public Plans




No provincial or territorial public drug plans provide coverage for medical cannabis



Canadian law allows patients to buy medical cannabis with money from health-care spending accounts (not Drug/Pharmacy Benefits), which are financed by employers, but insurance companies make their own decisions on coverage



Some private plans are considering limited coverage for certain medical conditions. Insurers have adopted a general position that it's not “medical marijuana for any purpose,” but for “specific conditions and symptoms where the evidence is clear that medical cannabis has enough value to outweigh risks”



Insurers are imposing limits in terms of price caps and medical conditions

Who was using cannabis before its legalization?



44.5% – consumption of Canadians 15+ years lifetime



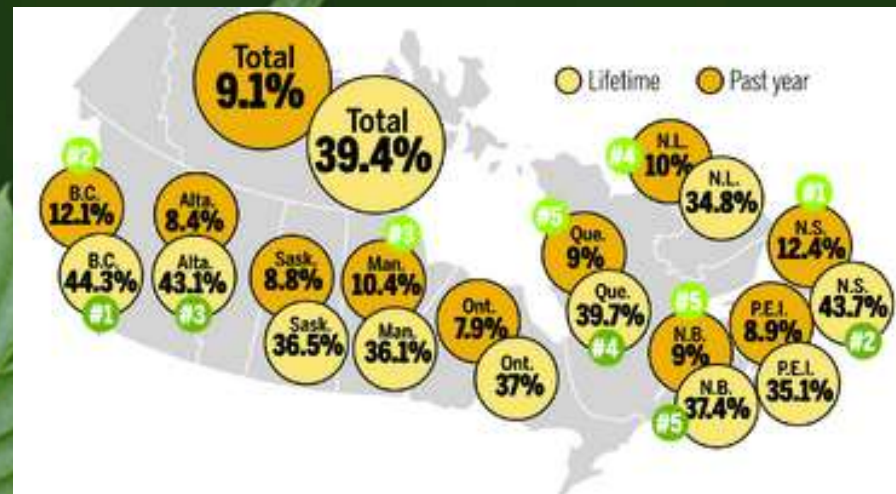
12% – consumption of Canadians 15+ years in the past year



33% – daily or almost daily consumption in the past year



24% – consumption for medical purposes in the past year



Prevalence of cannabis use, 2015

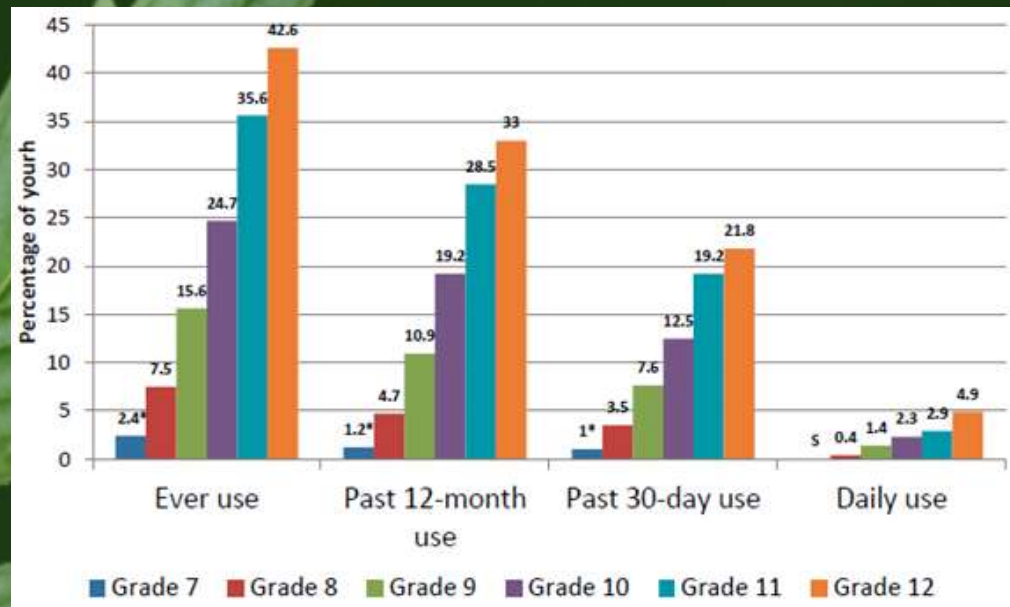
Who was using cannabis before its legalization?



21% – use by 15-19 year olds in the past year

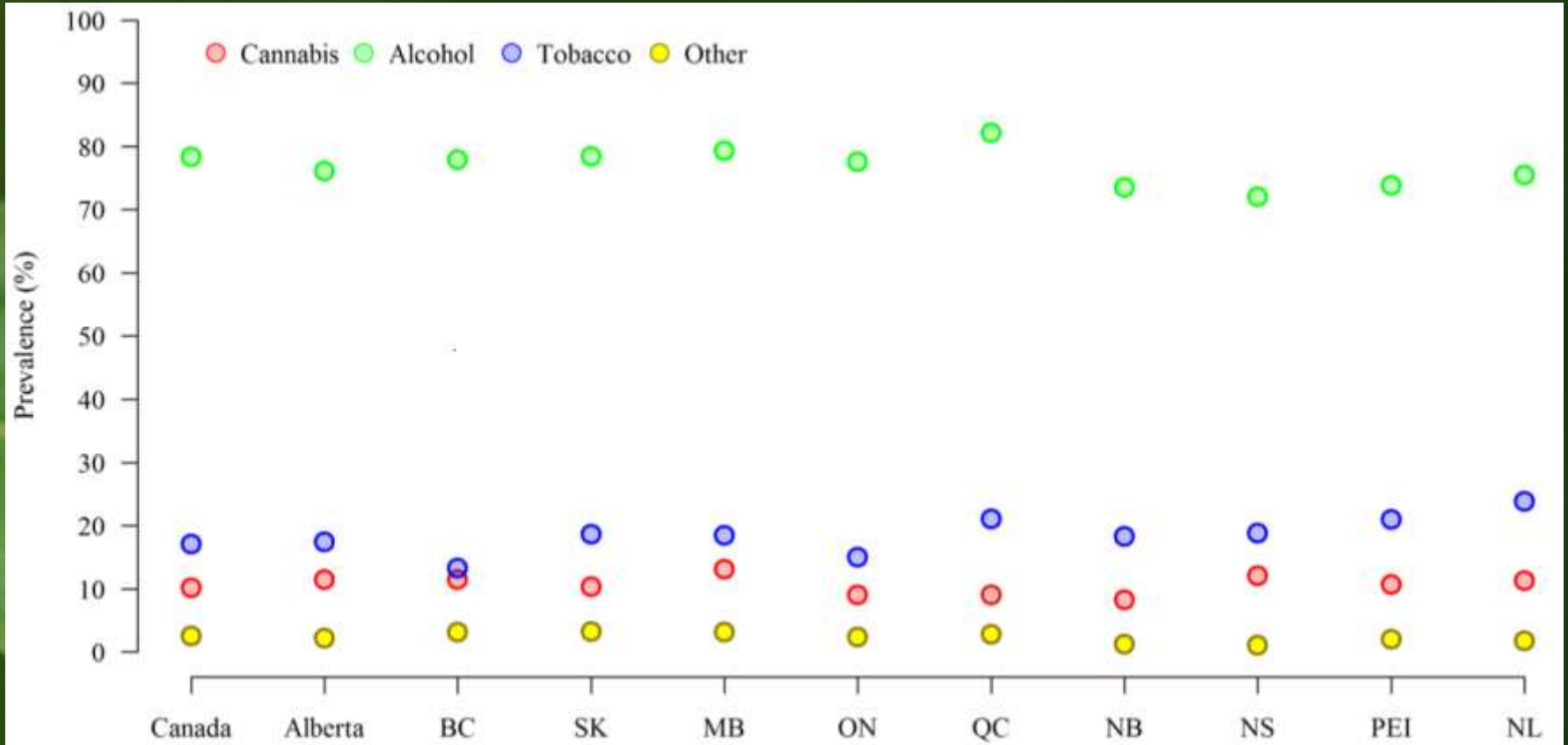


30% – use by 20-24 year olds in the past year



Prevalence of cannabis use – Canadian youth, 2014-2015

Cannabis use vs other substances



Cannabis Use Compared to Other Substances within the past 12 Months, 2012



Cannabis use



Indigenous aspect

Some Elders across Canada from various linguistic cultures of Indigenous peoples have said that cannabis has been used historically in two specific ways:



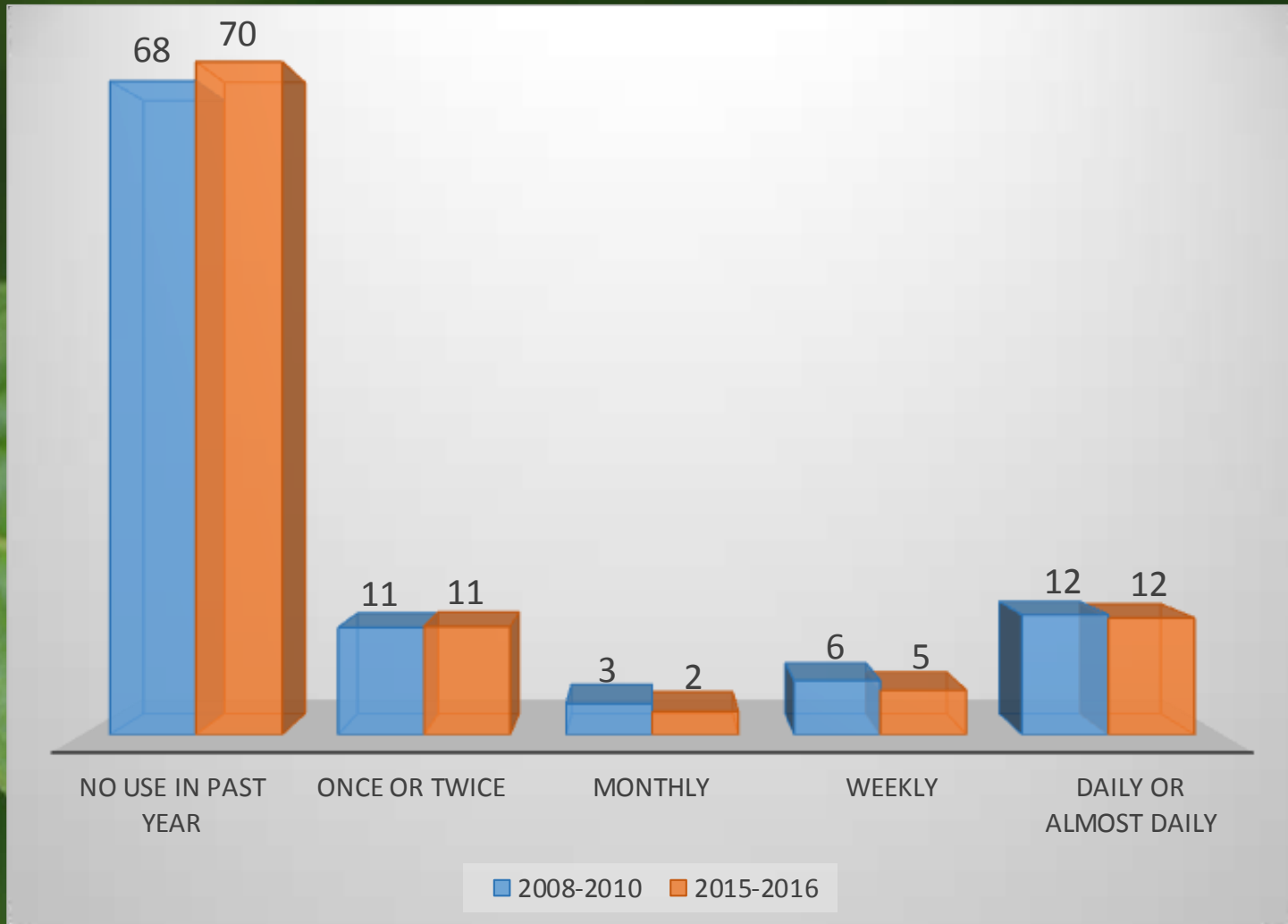
The cannabis was prepared in a culturally appropriate way to create a topical solution to treat pain, such as arthritis. However, it was not ingested or smoked



The cannabis was prepared in a culturally appropriate way and within ceremony to lessen symptoms of psychosis (undiagnosed), such as schizophrenia




Cannabis use amongst First Nations adults before its legalization, %



Cannabis possession

Medical




The maximum amount that an adult is authorized to possess in a public place, for their own medical purposes, is an amount that is equivalent to the lesser of:

(a) 30 times the daily quantity of dried cannabis indicated in their registration document or,

(b) 150 g of dried cannabis

Valid authorization to possess cannabis for medical purposes from Health Canada is required

Recreational



The maximum amount that an adult is authorized to possess in a public place, for recreational purposes, is an amount that is equivalent to the lesser of:

(a) 30 g of dried cannabis



Cannabis and safety-sensitive work

Health care professionals

Use of cannabis can lead to impairment, which may adversely impact the performance of individuals at work

Timing and duration of cannabis impairment is variable

It is not advisable to engage in safety-sensitive tasks for **24 hours** following cannabis consumption, or for longer if impairment persists



Cannabis – reliable resources



Health Canada:

- **Cannabis info**

<https://www.canada.ca/en/services/health/campaigns/cannabis.html>



The Centre for Addiction and Mental Health (CAMH):

- **Canada's Lower-Risk Cannabis Use Guidelines (LRCUG)**

<https://www.camh.ca/-/media/files/pdfs---reports-and-books---research/canadas-lower-risk-guidelines-cannabis-pdf.pdf>

- **Lower-Risk Cannabis Use Guidelines (LRCUG) for Youth**

https://www.camh.ca/-/media/images/all-other-images/research-lrcug-for-youth/lrcug_for_youth-eng-pdf.pdf?la=en&hash=15D9E4FBB8DBA73B665C3267E64FE233F937A298



AHS:

- **Cannabis info**

<https://www.albertahealthservices.ca/info/Page15989.aspx>

Future trends

Oct 2019 – edible cannabis products will be legalized for sale



Canadians are expected to increase their consumption of the drug by up to 35% and spend as much as \$7 billion on legal and illegal sales in 2019



Acknowledgments

- Dr. Wadieh Yacoub, First Nations and Inuit Health
- Dr. Chris Sarin, First Nations and Inuit Health
- Jack Kennedy, First Nations and Inuit Health
- Dr. Christopher Sikora, AHS
- Dr. Jason Cabaj, AHS
- Dr. Sebastian Straube, University of Alberta

References

1. History of medical cannabis. <https://www.visualcapitalist.com/wp-content/uploads/2018/06/history-of-medical-cannabis.html>
2. Cannabis facts and FAQs: A guide to legalization (2018). University of Calgary FAQ e-book, p.19.
3. What is Indica and Sativa? www.spiffseeds.nl/what-is-indica-and-what-is-sativa.html
4. Government of Alberta (2016). Cannabis Evidence Series An Evidence Synthesis The Health Technology Assessment Unit, University of Calgary February 2, 2017
5. Health Canada (2013). Information for Health Professionals: Cannabis and the cannabinoids .
6. Hill, M. (2017). Cannabinoids 101. Presentation at 'Cannabis Legalization in Canada: Implications for Public Health in Alberta'. O'Brien Institute for Public Health, Calgary AB.
7. Health Canada (2013). Information for Health Professionals: Cannabis and the cannabinoids .
8. Caulkins, J., Kilmer, B., & Kleiman, M. (2016). Marijuana legalization: what everyone needs to know. 2nd ed. New York, NY: Oxford University Press.
9. University of Calgary (2018). Cannabis facts and FAQs: A guide to legalization.
10. Government of Alberta (2016). Cannabis Evidence Series An Evidence Synthesis The Health Technology Assessment Unit, University of Calgary February 2, 2017
11. Mehmedic, Z., Chandra, S., Slade, D., Denham, H., Foster, S., Patel, A. S., Ross, S. A., Khan, I. A. and ElSohly, M. A. (2010), Potency Trends of Δ^9 -THC and Other Cannabinoids in Confiscated Cannabis Preparations from 1993 to 2008*. Journal of Forensic Sciences, 55: 1209-1217. doi:10.1111/j.1556-4029.2010.01441.x
12. Canadian Tobacco, Alcohol and Drugs Survey (CTADS); Statistics Canada: 2015 . <https://www.canada.ca/en/health-canada/services/canadian-tobacco-alcohol-drugs-survey/2015-summary.html>
13. Cannabis Evidence Series An Evidence Synthesis The Health Technology Assessment Unit, University of Calgary February 2, 2017. Government of Alberta (2016).
14. Whiting PF, Wolff RF, Deshpande S, et al. Cannabinoids for medical use: a systematic review and meta-analysis. Jama. 2015;313(24):2456-2473.
15. First Nations Information Governance Centre, National Report of the First Nations Regional Health Survey Phase 3: Volume One, (Ottawa: 2018). 200 pages. Published in March 2018. Available at: https://fnigc.ca/sites/default/files/docs/fnigc_rhs_phase_3_national_report_vol_1_en_final_web.pdf
16. Volkow ND, Baler RD, Compton WM, Weiss SR. Adverse health effects of marijuana use. N Engl J Med. 2014;370(23):2219-27.
17. Nutt D., King LA., Phillips LD. Drug harms in the UK: a multicriteria decision analysis. The Lancet, Volume 376, Issue 9752, 2010, p. 1558-1565, ISSN 0140-6736, [https://doi.org/10.1016/S0140-6736\(10\)61462-6](https://doi.org/10.1016/S0140-6736(10)61462-6).
18. Rodriguez D. Washington State Marijuana Impact Report. March 2016 2016
19. <https://sapiensoup.com/human-metabolism-thc>
20. Huestis MA, Henningfield JE, Cone EJ. Blood cannabinoids. I. Absorption of THC and formation of 11-OH-THC and THCCOOH during and after smoking marijuana. J Anal Toxicol. 1992 Sep-Oct;16(5):276-82 PubMed PMID: 1338215.
21. Agenda, C. O., & Board on Popular National Academies of Sciences, E. a. (2017). The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research. Washington, DC: The National Academies Press.
22. Wall ME, Perez-Reyes M. The metabolism of delta 9-tetrahydrocannabinol and related cannabinoids in man. J Clin Pharmacol. 1981 Aug-Sep;21(8-9 Suppl):178S-189S. PubMed PMID: 6271823.
23. Nahas GG. Marijuana: toxicity and tolerance. In Medical Aspects of Drug Abuse. 1975. Republished in Ashton CH. Pharmacology and effects of cannabis: a brief review. Br J Psychiatry. 2001 Feb;178:101-6. Review. PubMed PMID: 11157422.
24. Grotenhermen F. Pharmacokinetics and pharmacodynamics of cannabinoids. Clin Pharmacokinet. 2003;42(4):327-60. Review. PubMed PMID: 12648025.
25. Lindgren JE, Ohlsson A, Agurell S, et al. Clinical effects and plasma levels of delta 9-tetrahydrocannabinol (delta 9-THC) in heavy and light users of cannabis. Psychopharmacology (Berl). 1981;74(3):208-12. PubMed PMID: 672648.
26. Bombay, A., Matheson, K., & Anisman, H. (2014) The intergenerational effects of Indian Residential Schools: Implications for the concept of historical trauma. Transcultural Psychiatry, 51(3), 320 – 338
27. Canadian Medical Association: CMA Statement Authorizing Marijuana for Medical Purpose (Update 2015) <http://policybase.cma.ca/dbtw-wpd/Policypdf/PD15-04.pdf>. Retrieved (June 2016).
28. Rocky Mountain High Intensity Drug Trafficking Area Support Center. Legalization of Marijuana in Colorado: The Impact Volume 4. 2016
29. Position statement on the implications of cannabis use for safety-sensitive work, 2018
30. Whiting PF, Wolff RF, Deshpande S, et al. Cannabinoids for medical use: a systematic review and meta-analysis. Jama. 2015;313(24):2456-2473.
31. Minister of Justice. Access to Cannabis for Medical Purposes Regulations. 2016; <http://laws-lois.justice.gc.ca/PDF/SOR-2016-230.pdf>. Accessed September 7, 2016.
32. Cannabis Act. <https://laws-lois.justice.gc.ca/PDF/C-24.5.pdf>
33. Cannabis Regulations. <https://laws-lois.justice.gc.ca/PDF/SOR-2018-144.pdf>
34. Position Statement Cannabis in the Workplace. AHS, 2018. <https://inside.albertahealthservices.ca/media/assets/ba/ahs-hr-ahs-cannabis-position-statement.pdf>
35. Cannabis for Medical Purposes Guidelines. AHS, 2018.

Thank you for your attention!
Questions

