

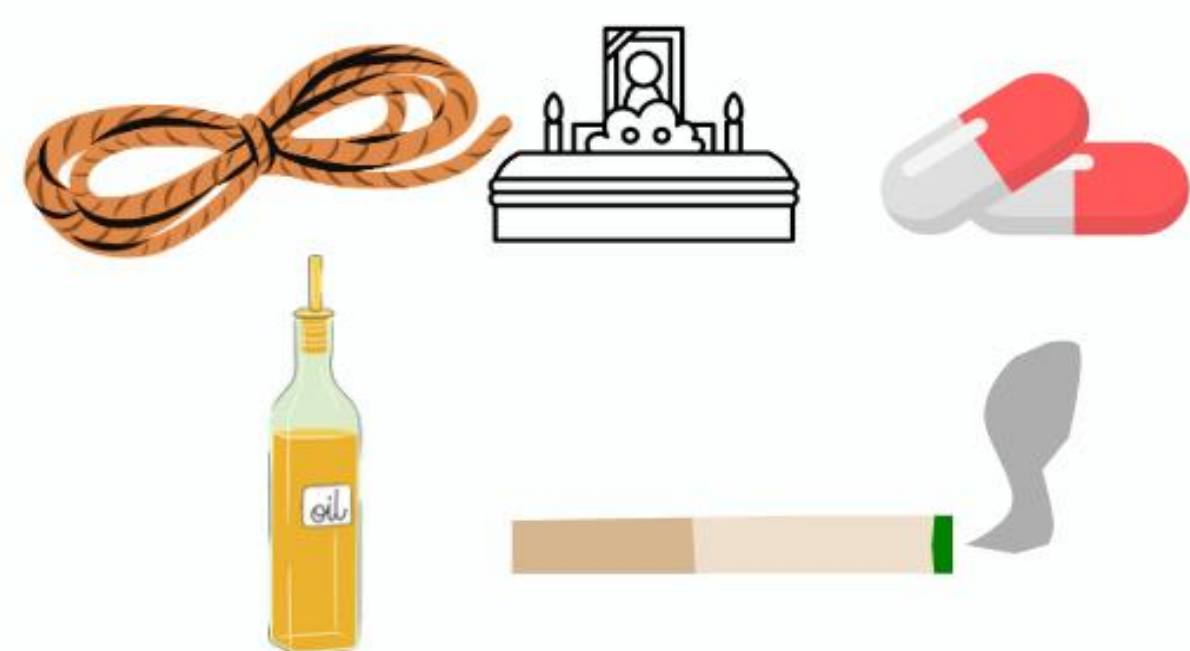
The Biological, Psychological, and Societal Implications of the Legalization of *Cannabis sativa* in Canada: Lessons and Outlook

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HISTORIC BACKGROUND

- Cannabis sativa* is composed of high-cellulose fibers used to create ropes and sailboats for centuries
- The seeds are consumed for protein and oil
- The *Atharva Veda* book of Hinduism lists *C. sativa* as sacred in the Hindu god Shiva's favourite drink, bhang
- During the Islamic Golden Age in 1000 CE, *C. sativa* became important in the treatment of chronic diseases such as malaria, asthma and anthrax
- At the second International Opium Convention, *C. sativa* was restricted to medicinal purposes or research only
- Currently, many countries including Canada, have regulated and decriminalized the recreational use of *C. sativa* at the federal level



QUESTION & OBJECTIVES

Q: What are the characteristics of *C. sativa*, its effects on psychological and biological addiction, risk of disease for various age groups, effects of prohibition and legalization, and does it act as a gateway drug?

- O:** (1) Evaluate Risk of Disease
 (2) Analyze trends and lessons learned from other countries that have legalized *C. sativa*
 (3) Discuss implications as a gateway drug

METHODS

Literature Review

NEUROLOGICAL EFFECTS

THC ↔ ANANDAMIDE

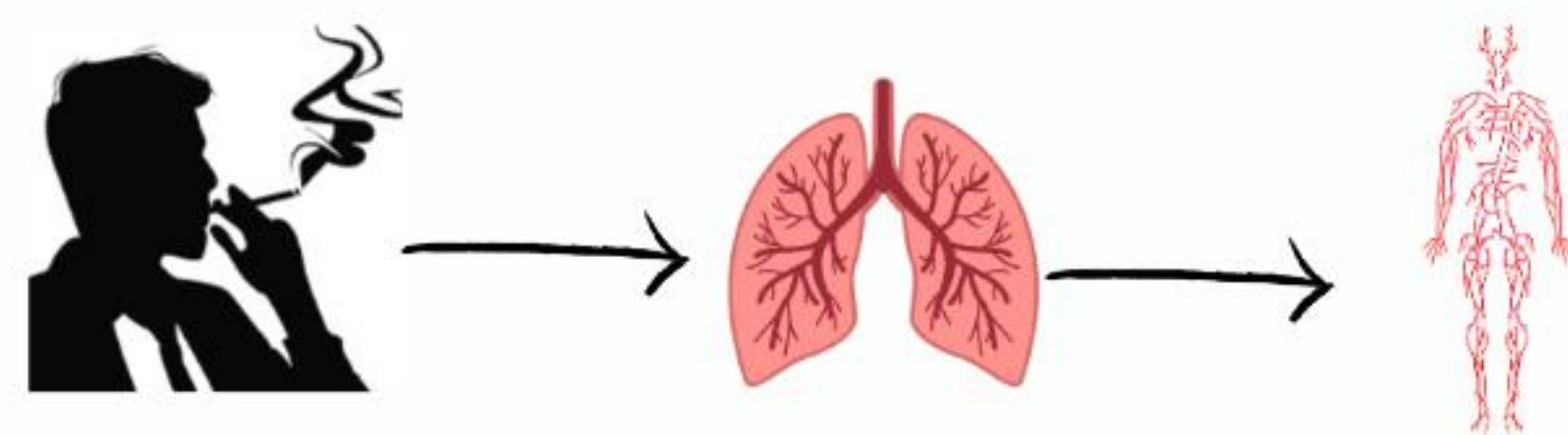


- THC binds CB1 for pain management/stimulating appetite
- THC binds CB2 to control automatic processes such as breathing

THC interferes with the hippocampus, orbitofrontal cortex, and cerebellum affecting ability to create new memories, redirect focus, and regulate balance respectively



PSYCHOLOGICAL & BIOLOGICAL ADDICTION



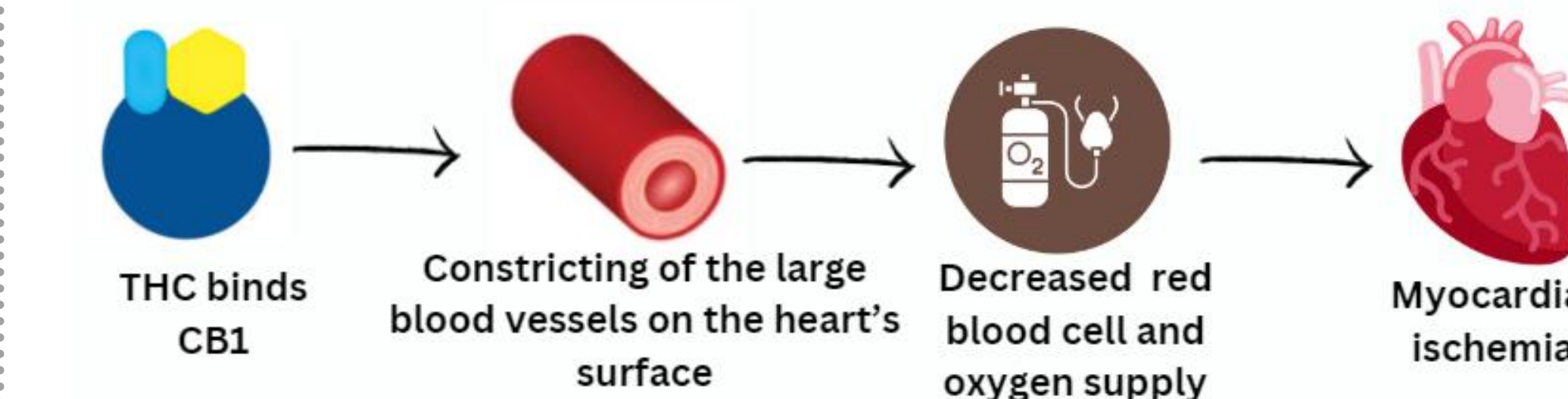
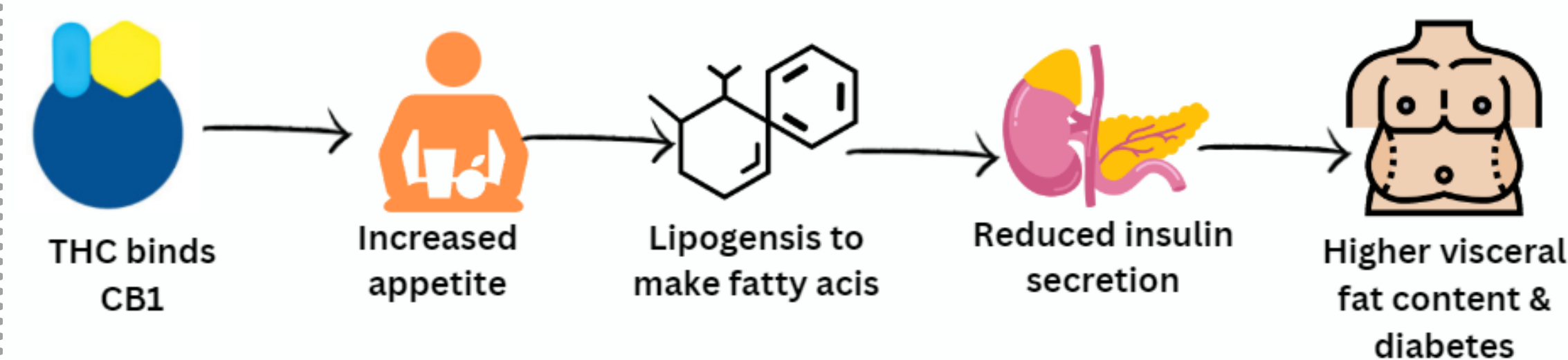
- In a survey on 1,000 users of *C. sativa* in New Zealand:**
- 15% reported psychotic symptoms (panic, derealization, depersonalization)
 - 35% of participants indicated that they cannot control their *C. sativa* consumption, despite wanting to stop

- In a study on 5,120 US soldiers serving in Germany who smoked *C. sativa* thrice a week:**
- 720 suffered from confusion, hostility, and dis-orientation
 - 20% of users indicated that restlessness was the most common symptom of withdrawal

Recommendation: When legalizing *C. sativa*, industries must follow government policies that regulate safe levels of THC.

RISK OF DISEASE

- In a study on 50,465 Swedish participants followed for 15 years:**
- Consumption of *C. sativa* by 18 increases likelihood of developing schizophrenia by 2.4 times
 - Those genetically predisposed showed more symptoms



- Comparing 22 daily users and 22 non-users of *C. sativa* for two years aged 23-25:**
- Decline in processing speed in users
 - Higher dose impaired attention, reaction time, learning, and recall accuracy

No conclusion could be drawn about the overall benefits in pain management or harm associated with use leading to Alzheimer's from a meta-analysis comparing 130 studies among the elderly



LESSON LEARNED FROM LEGALIZATION

✓ *C. sativa* was first approved in Canada in 2001 for health problem that could not be managed using standard therapies e.g. HIV/AIDS or chemotherapy-induced nausea.

Banned in 2004 due to concerns with the illicit market

- POST LEGALIZATION IN CANADA:**
- Consumption increased from 10.7% in 2017 to 16.3% in 2018
 - Canadian Cannabis Survey (2021) found a decrease in consumption among youth compared to 2020 from 31% to 21.1% for males and from 23% to 18.4% for females
 - 62.3% prevalence of *C. sativa* use amongst Indigenous youth, compared to 43.8% consumption among non-Indigenous youth
 - Decrease in injuries related to *Cannabis*-impaired driving in all provinces post-legalization, except for in British Columbia

It has been 22 years since Portugal decriminalized all drugs in 2001

- Portugal reported a chronic heroin addiction crisis & highest HIV infections rates in the European Union
- Legalization of all drugs was believed to prevent addiction by allowing the government to offer support in the form of rehabilitation and mental health resources

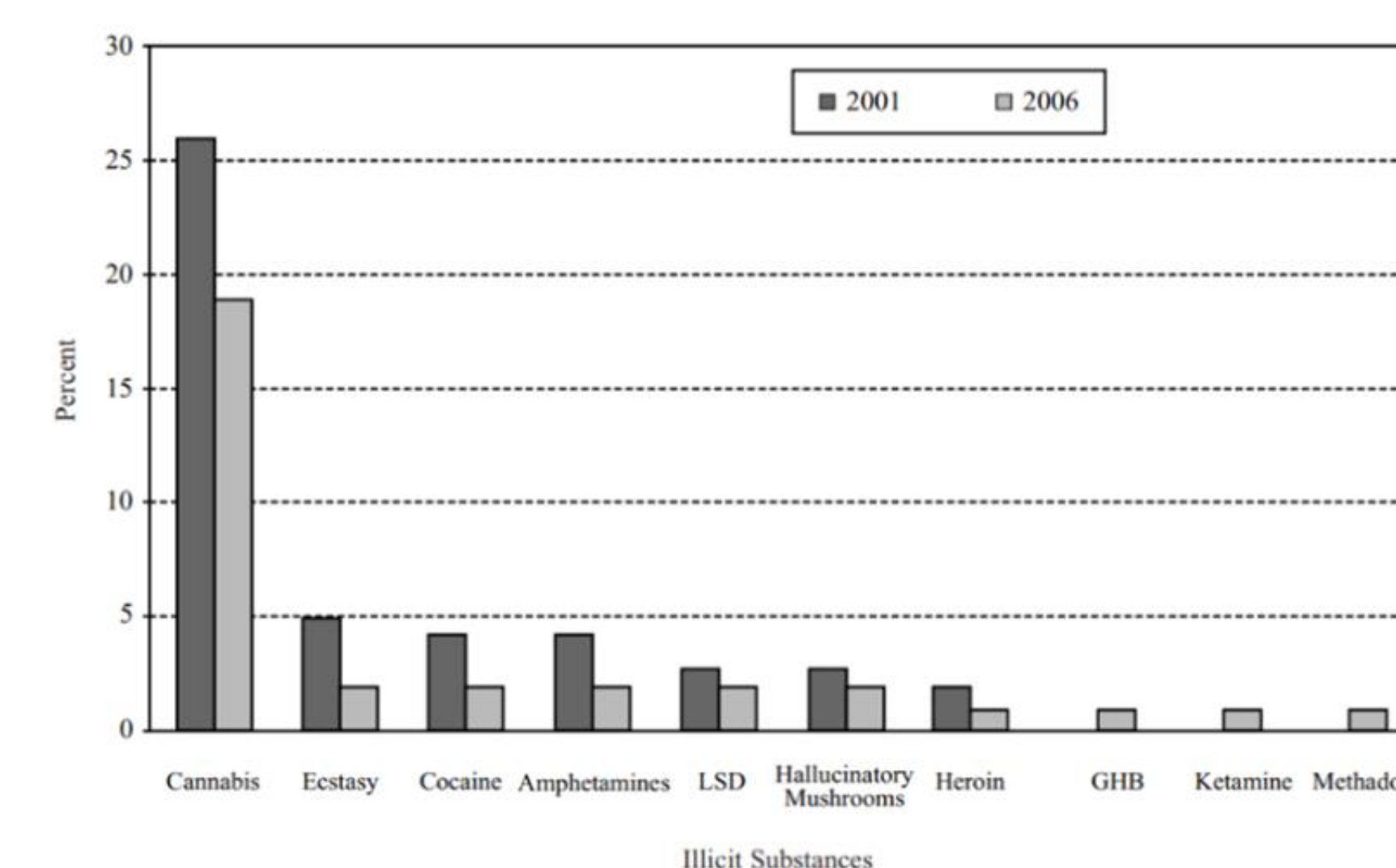


Figure 1: Prevalence of illicit substance use in 2001 and 2006 by the National Investigation in School Environment for ages 16-18 in Portugal (Greenwald, 2009).

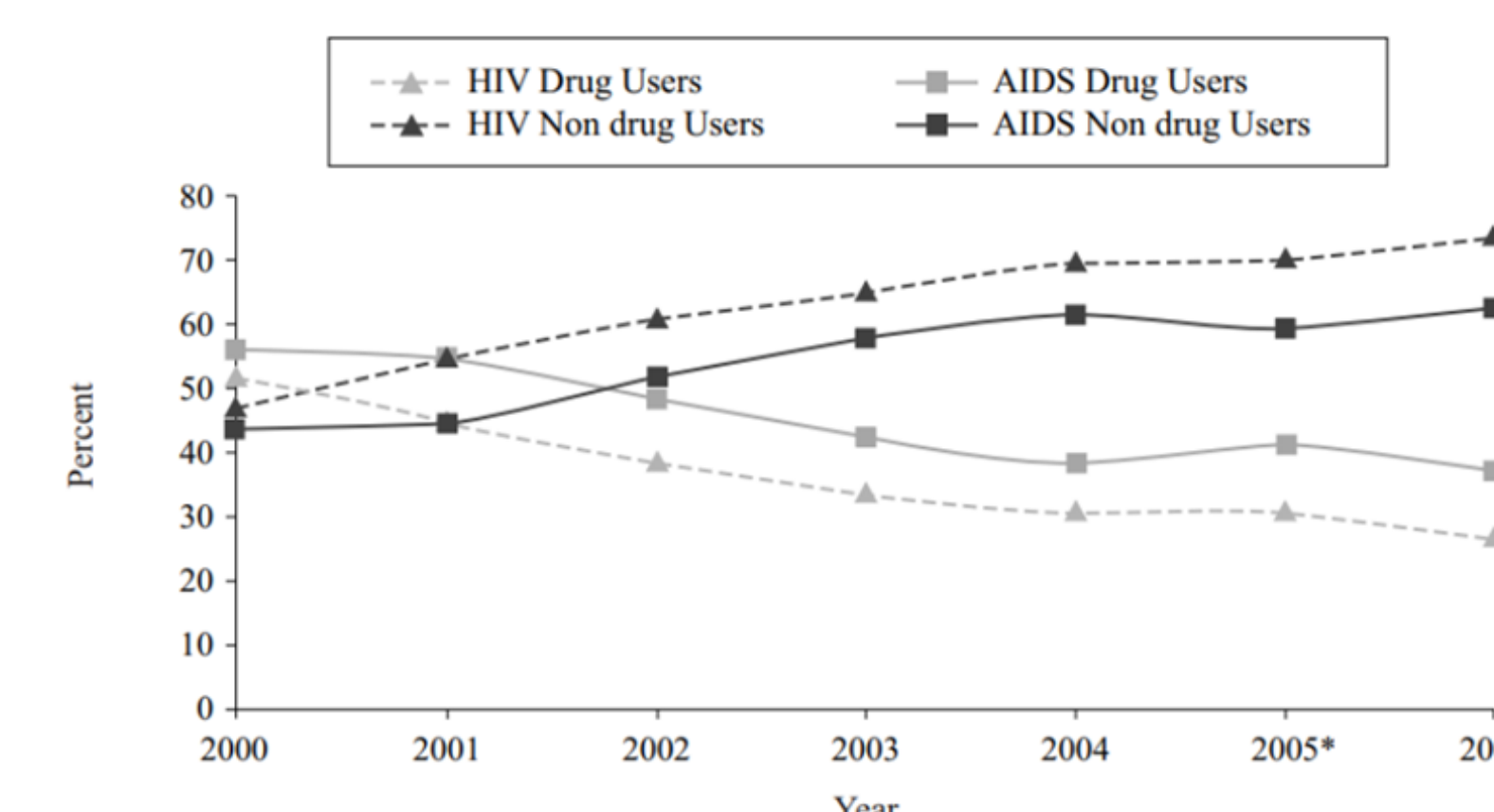


Figure 2: Percentage of drug users and nondrug users among newly diagnosed HIV/AIDS individuals from 2000-2006, in Portugal (Greenwald, 2009).

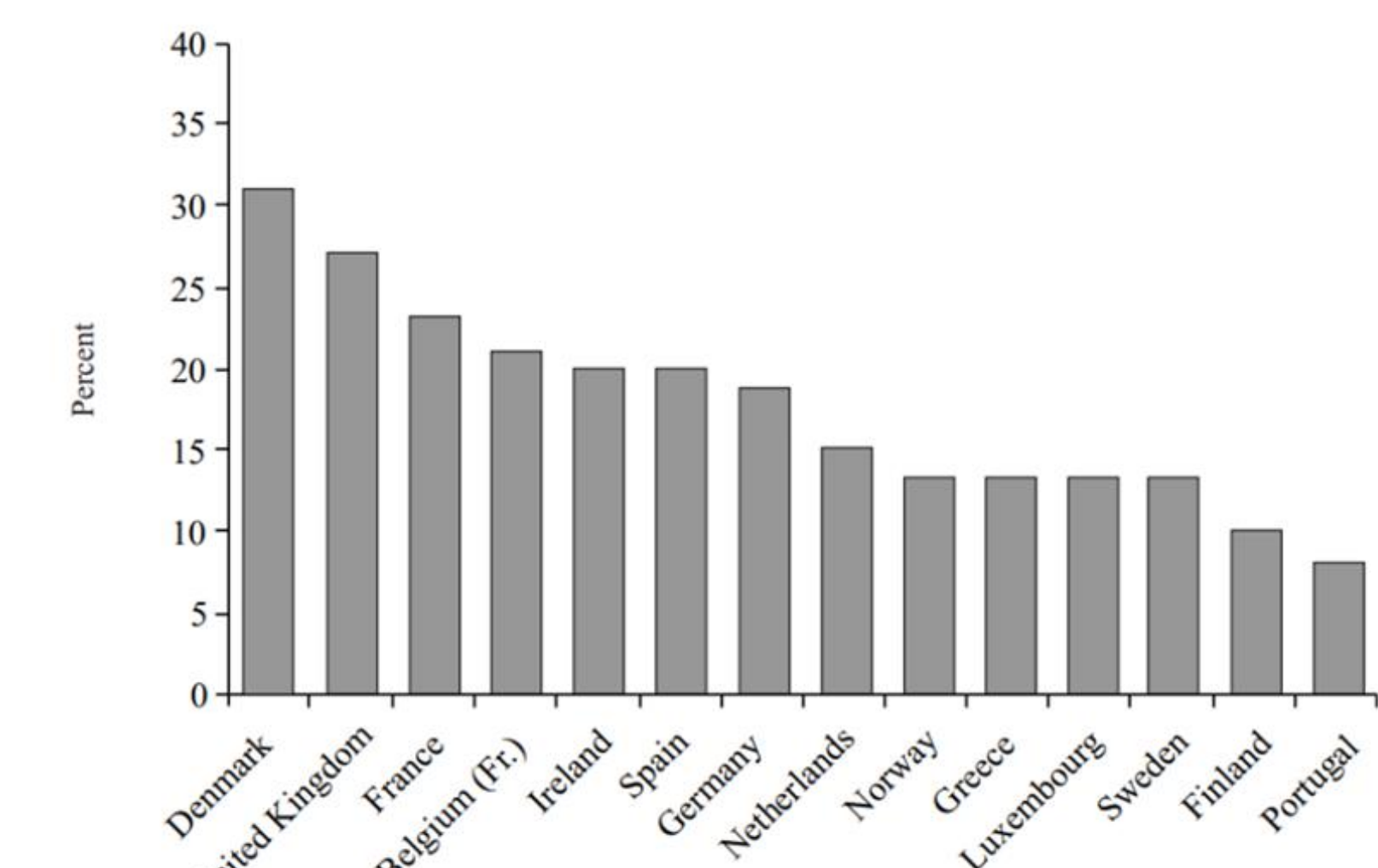


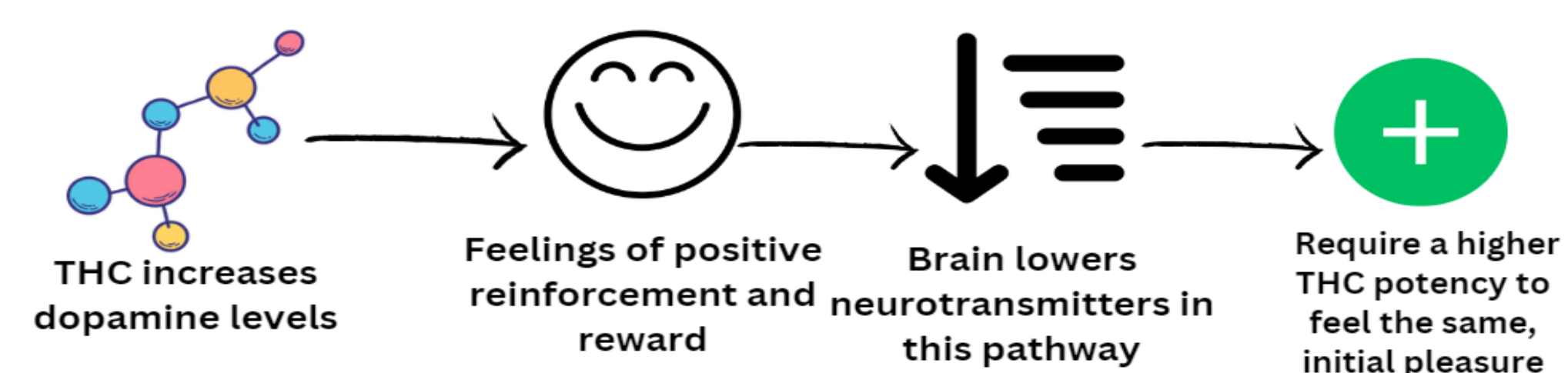
Figure 3: Cannabis prevalence among the European Union from 2001-2005 in the general population aged 15-64 (Greenwald, 2009).

POST LEGALIZATION IN 38 STATES IN THE UNITED STATES OF AMERICA



- Before legalization in 2008, there were 599.2 arrests per 100,000 population for Black individuals, and 210.9 arrests per 100,000 population for White individuals.
- Post legalization in 2019, incarceration rates decreased to 38.0 per 1000,000 population for Black individuals, and 15.9 per 100,000 population for White individuals

IMPLICATIONS AS A GATEWAY DRUG



The National Longitudinal Study of Adolescent to Adult Health (1994-2002) conducted 18 tests that matched propensity to *C. sativa* and hard drug use:

- Only three tests were statistically significant and meaningful showing a weak correlation
- Link could represent exposure to the illicit market when purchasing *C. sativa* in a country where it is criminalized
- Accounting for genetic differences, socioeconomic factors, gender, race, and environmental factors, the common-factor theory proposes drug use propensity causes an inclination towards both *C. sativa* and hard drug consumption



Not enough strong evidence to suggest that *C. sativa* indeed acts as a gateway drug

FUTURE DIRECTIONS

- Conduct longitudinal studies that follow participants/elderly across the next decade in Canada
- Create policies that educate about the harms associated with for adolescents consuming *C. sativa*
- For increased credibility, public health advertisements must take caution not to exaggerate effects e.g. follow alcohol regulations mentioning driving under influence and developmental risks for infants
- Place a legal cap on THC content for the safety of consumers
- Create social and mental health support therapies specific to Indigenous peoples and their culture

REFERENCES

