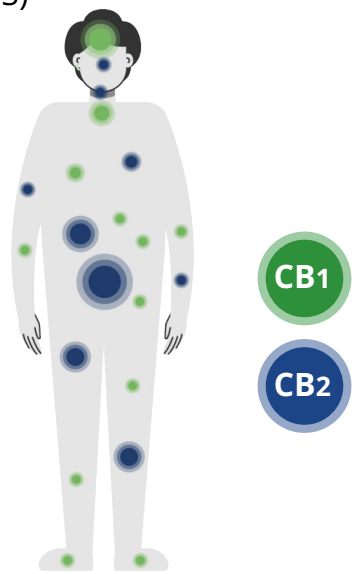
Factsheet: Cannabis legalization

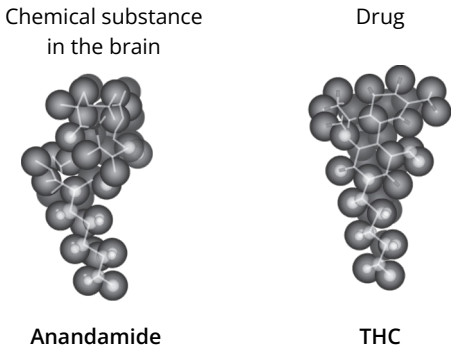
Cannabis use by adults

THC acts by binding to the receptors in the Endocannabinoid-System (ECS)



- The ECS is part of the human nervous system
- It is composed of cannabinoid receptors (CB1 and CB2) and endocannabinoids and enzymes (Lu & MacKie, 2016)
- The ECS is involved in vital processes such as (Fraguas-Sánchez & Torres-Suárez, 2018):
    - Energy balance
    - Appetite stimulation
    - Blood pressure
    - Pain modulation
    - Embryogenesis
    - Control of nausea and vomiting
    - Memory
    - Digestion
    - Learning
    - Immune response

- THC can partially bind to receptors (higher affinity for CB1) through its analog, three-dimensional structure to the endocannabinoid anandamide ("Ananda" Sanskrit for "bliss") (Fraguas-Sánchez & Torres-Suárez, 2018)
- Through this, THC has the ability to affect pain, spasticity, sedation, appetite and mood (Russo, 2011)
- Ongoing research is constantly expanding the constituents and functions of the ECS (such as adding more metabolizing enzymes and receptors)



Structure of THC compared to anandamide (after NIDA, 2020)

Why cannabis is used

Cannabis in "recreational use" can have an influence on, among other things:

- Relaxation
- Pain relief
- Mood
- Sociability
- Appetite
- Perceptions of color, time and space (de Melo Reis et al., 2021)

Cannabis use by adults

Short-term side effects due to imprecise action of THC in the ECS

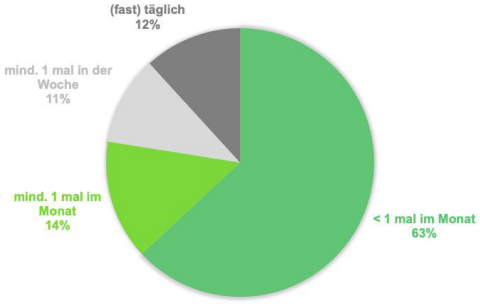
Possible short-term side effects of THC:

- Effect may be desirable in one case and undesirable in another, e.g., sedation, increased appetite, muscle relaxation
- Possible acute side effects mainly affect the psyche (euphoria, anxiety, fatigue, drowsiness, confusion) and psychomotor function (decreased psychomotor performance and traffic-related performance), as well as the heart and circulation (tachycardia, drop in blood pressure, dizziness, syncope) (Grotenhermen & Häussermann, 2017)
- For medicinal cannabis, THC side effects have been classified as mild to moderate (Fraguas-Sánchez & Torres-Suárez, 2018)

Intense cannabis use can cause long-term side effects

Repeated and prolonged cannabis use can:

- lead to cannabis use disorders (CUD) and dependence, which affects approximately ten percent of regular users (Rup et al., 2021)
- lead to tolerance development and reversible forms of cognitive impairment, particularly of attention and memory (Hall et al., 2001)
- be associated with increased risk of mental disorders when predisposed (Lev-Ran et al., 2014; Hines et al. 2020; National Academies, 2017)
- be associated with adverse respiratory effects when smoked (National Academies, 2017)
- significantly increase the risk of adverse effects with higher frequency of use and higher THC content (Anderson et al., 2019)
- but have no adverse effects on blood, liver, kidney, or hormone levels (Ware et al., 2015)



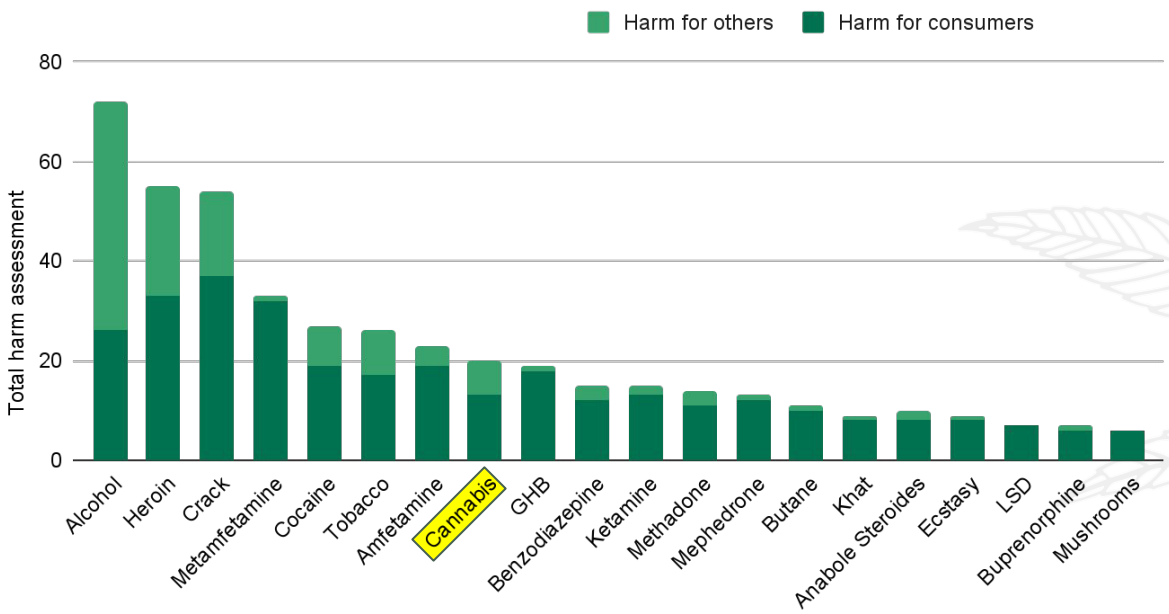
Consumption frequencies of the 12-month users (ESA, 2018)

Certain groups of people should not use cannabis

Cannabis should not be used (Likar et al., 2017):

- if there is a personal or family history of psychosis or schizophrenia
- in the presence of unstable coronary artery disease
- during pregnancy or lactation
- by minors

Cannabis use by adults



Drug-related harms in the United Kingdom (Nutt et al., 2010)

The potential for harm to users and others is lower for cannabis than for many other stimulants and drugs (Nutt et al., 2010)

Alcohol is more harmful than cannabis

Table: Comparison of health harms of cannabis and alcohol (nach Sellman, 2020)

*Evidence that ethanol is more harmful than Delta9-THC.
**Good evidence that ethanol is significantly more harmful than Delta9-THC.

	Cannabis (Delta9-THC)	Alcohol (Ethanol)
Risk of death from overdose	almost zero	relatively high**
Aggressiveness during intoxication	low	moderate/high**
Anxiety during intoxication	moderate	nearly zero
Risk of damage when driving while intoxicated	moderate/high	high*
Irritability during withdrawal	moderate	moderate
Risk of death during severe withdrawal	nearly zero	relatively high**
Brain damage during chronic heavy use	possible	definitely**
Risk of fetal brain damage	probably low	very high**
Risk of liver and other organ damage	low	high**
Risk of developing addiction	moderate	moderate
Triggering of psychotic states	yes, but very rarely	yes, but rarely
Causing severe depression	possible	definitely*
Causing cancer	no evidence for THC, but possible when smoking as a form of consumption	definitely carcinogenic**

Cannabis use by adults

Lower-risk, self-determined, non-medical cannabis use

Example Canada: "Guidelines for lower-risk cannabis use" (adapted from Fischer et al., 2017)

1. The only way to avoid the risks is to not use cannabis
2. The earlier use is initiated, the more severe the negative effects are likely to be
3. The higher the THC content of the product, the higher the risk for mental health problems
4. Do not consume synthetic cannabinoids
5. Prefer vaporizers or oral products to smoking
6. When smoking, do not inhale deeply and hold your breath (this increases the absorption of toxins)
7. Limit cannabis use as much as possible to minimize risks (e.g. 1x per week)
8. Do not drive a vehicle or operate machinery for at least six hours after consumption
9. Persons with predispositions to psychotic disorders as well as pregnant women should refrain from consumption altogether due to the precautionary principle
10. Do not use cannabis at the same time as alcohol or other drugs
11. The combination of the above-mentioned points increases the risk negative health consequences
12. When using cannabis, be aware of the risks and side effects, which depend on the characteristics of the user, consumption patterns and product properties

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