

What are Drugs?

The term drug is originally found in french (“drogue”: *spice, chemical, pharmaceutical substance*) and in german it is nowadays mostly used to describe illicit, psychoactive substances, a development that started in the 20th century

Pharmacology vs Politics

Whether a substance is commonly classified as an illicit "**drug**" or a harmless "everyday **stimulant**" is not a medical or scientific decision. Rather, it is the result of political processes and societal norms.

In modern science, all of these compounds are classified as psychoactive substances. They share the ability to cross the blood-brain barrier—a biological filter designed to shield the brain from harmful toxins. Once across, these molecules interfere directly with synaptic signaling, **altering the release and uptake of neurotransmitters**.

The result is a temporary, profound shift in human perception, cognition, emotion, and behavior. The immediate risks of this altered state range **from minor symptoms** like dry mouth to **fatal overdose**. In the long term, repeated use can lead to the development of dependence and **addiction**.

Key mechanisms of Action

1. Depressants (sedatives): These substances slow down the activity of the central nervous system. They have strong anxiolytic (anti-anxiety), **calming**, and muscle-relaxing effects, significantly **detaching** the user **from physical pain**.

Examples: Alcohol, heroin, opioids, benzodiazepines

2. Stimulants: Stimulants trigger a massive release or block the reuptake of the body's natural stress hormones (neurotransmitters). **Fatigue** and hunger are **suppressed**, while self-esteem and alertness increase. The high is typically followed by a profound state of exhaustion (the "**crash**").

from

Examples: Nicotine, caffeine, cocaine, amphetamines

3. Hallucinogens: These compounds primarily bind to serotonin receptors and alter the brain's fundamental sensory filtering mechanisms. As sensory input is processed unfiltered, users may experience synesthesia ("hearing colors, seeing sounds"), visual **hallucinations**, and a profoundly **altered perception of space and time**. Their potential for addiction is generally very low.

Examples: Cannabis, LSD, Psilocybin (magic mushrooms)

*This often-debated and complex topic of intoxicants is only briefly touched upon here and deliberately presented in a simplified form. For a deeper exploration, we recommend the exhibition's primary sources: *Drugs and the Future: Brain Science, Addiction and Society* by David Nutt et al. (Academic Press), “Enzyklopädie der psychoaktiven Pflanzen” from Christian Rätsch (AT Verlag)*

„All substances are poisons; there is none which is not a poison. The right dose differentiates a poison from a remedy.“ - Paracelsus, 1538

How drugs affect the brain

The brain is protected from toxins by the blood-brain barrier—a highly selective biological filter. Psychoactive substances, however, are able to cross this barrier. Once inside the central nervous system, they interfere directly with neural signaling. By mimicking, blocking, or amplifying the body's own neurotransmitters, they alter fundamental cognitive and emotional processes.

Conscious thought

On the outer left half of the model, you can see the cerebral cortex—the seat of conscious thought, rational decision-making, and sensory processing. Psychoactive substances modify these processes by activating or inhibiting specific neural networks.

Sensory and Motor Cortex

The blue area (labeled "Sensory Cortex") processes our sensory perceptions, while the red area ("Motor Cortex") controls our movements. **Psychedelics** (such as LSD or psilocybin) interact strongly with sensory areas, leading to hyperconnectivity and profound visual or auditory hallucinations. **Sedatives** (such as alcohol), on the other hand, disrupt signal transmission in the motor cortex, resulting in delayed reaction times and a loss of motor coordination (ataxia).

The frontal Lobe

The front section of the brain (the prefrontal cortex) is responsible for executive functions such as impulse control, risk assessment, and **forward planning**. Substances such as **alcohol** have a strong inhibitory effect on this region. This **impairs critical judgment** and leads to noticeable disinhibition, as essential regulatory control mechanisms are temporarily suppressed.

Instinctual Drives and Autonomic Functions

The right cross-section of the brain reveals deeper, evolutionarily older structures such as the diencephalon (interbrain) and the brainstem. In these deep regions, psychoactive substances do not target rational thought, but instead **stimulate survival instincts** or depress unconscious bodily functions.

The Diencephalon

This region (comprising the thalamus and hypothalamus) regulates **fundamental drives** and the body's **internal reward system**. Stimulants (such as cocaine or amphetamines) trigger an abnormally large surge of the neurotransmitter dopamine here. The brain falsely equates substance use with a **critical survival** benefit, creating a pathological, conditioned urge known as **craving**.

The Brainstem

Connecting the brain to the spinal cord, the brainstem controls **essential autonomic functions** such as heart rate and respiration. Potent sedatives (such as heroin and other opioids) bind to receptors in this area, significantly suppressing its baseline activity. In the event of an overdose, this can cause the **respiratory reflex to shut down** entirely (respiratory depression)—the primary cause of fatal opioid overdoses.

Why do humans use drugs?

The consumption of psychoactive substances is neither a modern phenomenon nor a mere fringe occurrence. Across all eras and cultures, humans have used substances to alter their perception and emotional state. To understand problematic use, one cannot look solely at the pharmacological effects of a substance. Science identifies four motives for consumption, which are often deeply rooted in the human psyche.

Inner Mindset

Hedonism and Curiosity: The pursuit of pleasure (hedonism) and euphoria is the most common motivation for substance use. People consume substances to **intensify positive experiences**, celebrate festivities, or deepen the sensory perception of music and art. Another aspect is curiosity: particularly with psychedelics, the primary motivation is often the desire to **expand consciousness**, break rigid thought patterns, and gain new spiritual or psychological perspectives. This pattern of consumption is typically episodic and functional.

Self-Medication and Coping: This is the most critical motive and the most frequent starting point for addiction. Here, substances are deliberately used as a **coping strategy to numb** psychological or physical **pain**. Individuals with unresolved trauma, chronic stress, anxiety disorders, depression, or neurodivergent conditions (such as ADHD) rely on the pharmacological effects to regulate a baseline state they perceive as unbearable. In these cases, the substance serves as an attempt at a chemical solution for a deeper, often systemic problem.

External World and Society

Self-Optimization: In hyper-competitive, achievement-oriented societies, the functional aspect of substance use takes center stage. Substances are consumed to **keep up** with the steadily **rising demands** of work, academia, or daily life. The targeted use of stimulants (such as amphetamines, cocaine, or high doses of caffeine) serves to suppress fatigue, boost cognitive performance, or maintain an **artificial sense of self-confidence**. The substance thus becomes a tool for self-optimization and for adapting to a dysfunctional performance-driven system.

Social Integration: Humans are social creatures, and substance use is deeply tied to group dynamics. Particularly during adolescence and young adulthood, the consumption of mind-altering substances serves as a way to individuate from one's parents and **establish personal identity**. At the same time, shared intoxication fosters social cohesion. Those who partake conform to the norms of their peer group. This dynamic is most evident with culturally entrenched alcohol consumption, where paradoxically it is not the drinker, but the **abstinent individual who is expected to justify their choice**.

Why are drugs risky?

The historic advertising sign from the Berliner Kindl brewery is no anomaly; rather, it reflects our everyday cultural conditioning: a lethal substance became so normalized that associating it with childhood and cozy family warmth was considered harmless and commercially advantageous. This irrational divide between an accepted "everyday stimulant" and an illicit drug is not based on the actual harm of the substances.

Local culture

The societal risk assessment of psychoactive substances is not determined by medical professionals, but shaped by tradition and lobbying. In Germany, **alcohol and tobacco** enjoy protected status as "**cultural assets**." Their ubiquity—from supermarket checkout lanes to professional sports—suggests safety, even though they rank among the **most harmful** recreational substances of all.

A look at other cultures exposes the arbitrariness of this relationship. Across large parts of East Africa and the Arabian Peninsula, for instance, chewing the stimulant plant **khat** is a deeply rooted, everyday, and fully accepted social tradition. Conversely, alcohol consumption there is not only deeply condemned on moral grounds, but at times penalized with draconian prison sentences. The same holds true for the traditional use of **coca leaves** in the Andean regions of South America or **betel nut** across parts of Asia.

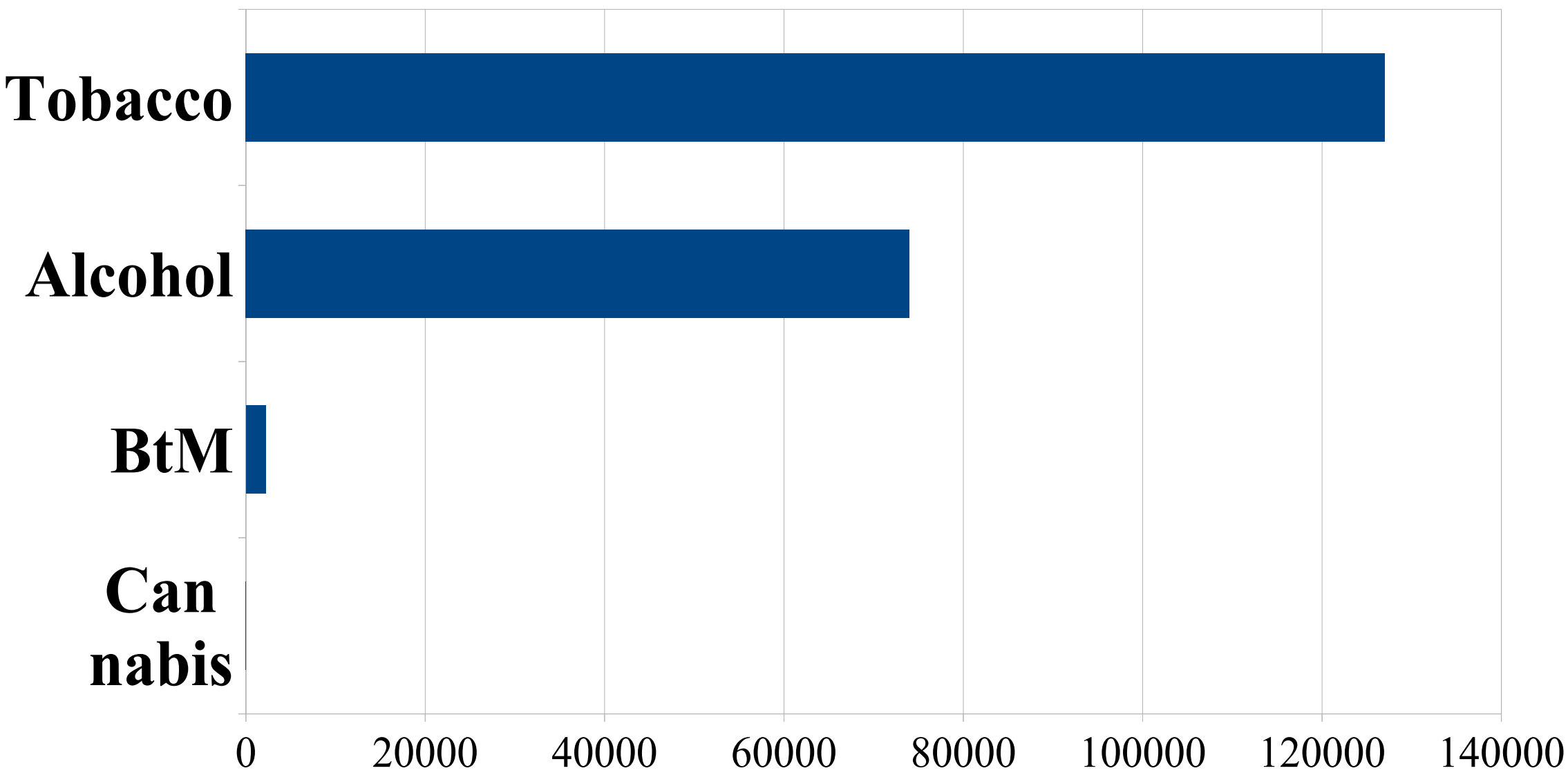
Substances that are not part of our own Western history were heavily stigmatized in the wake of global prohibition policies. The boundary between "legal enjoyment" and a "criminal offense" is therefore by no means drawn along toxicological facts; rather, it merely reflects the geographical and historical conditioning of a given society.

The scientific evidence

To assess substances objectively, a British research team led by pharmacologist Prof. David Nutt developed a comparative model based on 16 criteria, categorized into **harm to users** (such as mortality, dependence, and cognitive impairment) and **harm to others** (such as crime, family breakdown, and economic costs).

Alcohol ranks by a wide margin as the most harmful substance overall (with a **score of 72**). Ethanol is unmatched, particularly in its harm to others, as it causes severe disinhibition and plays a major role in violent crime and traffic fatalities. **Heroin (55 points)** and **cocaine (27 points)** follow in second and third place, where harm to the user predominates. **Tobacco (26 points)** causes immense long-term health damage and ties up vast healthcare resources.

In contrast, **cannabis (20 points)** and psychedelics such as **LSD (7 points)** or psilocybin (6 points)—the active compound in magic mushrooms—exhibit a substantially lower potential for physical and social harm, despite their classification as illicit controlled substances.



On the right: Comparison of drug deaths in Germany, statistics from the “Bundeskriminalamt”, BtM is a german legal Term for illicit drugs

Why do some people get addicted?

Millions of people worldwide consume psychoactive substances, yet only a fraction of them develop an addiction. Addiction is a complex disease that arises when three fundamental dimensions of human life fall out of balance.

Biology

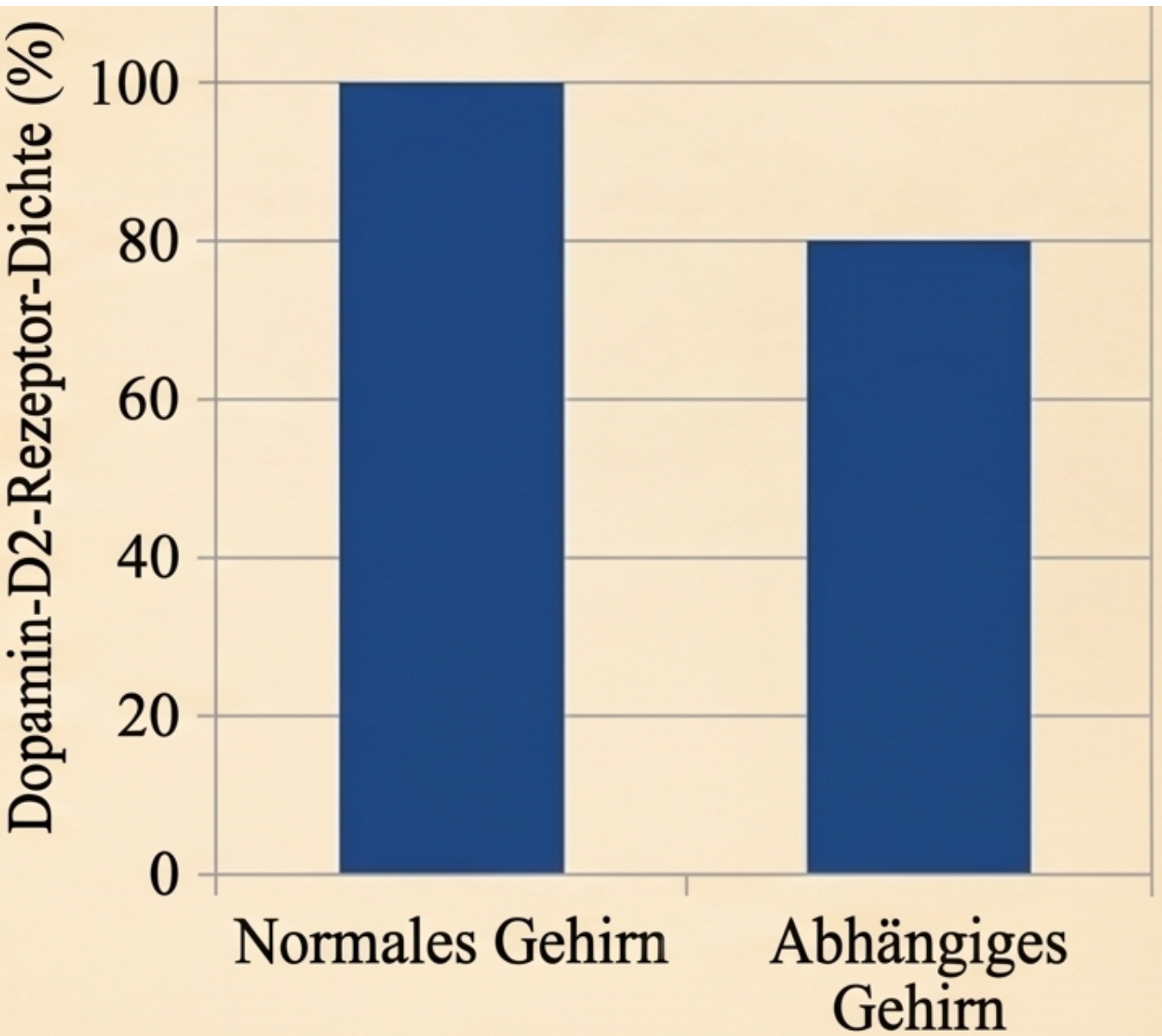
Scientific research shows that **genetics** accounts for nearly **half** of the **risk** of developing an **addiction**. In some individuals, the brain's reward system is naturally more sensitive. When these individuals consume drugs, their brains react much more intensely than that of the average person. They experience a profound internal equilibrium through the substance that others never feel as strongly. Furthermore, **genes regulate our metabolism**: in some people, it is structured in a way that leads to rapid tolerance development. This innate difference explains why some develop physical dependence after only a few uses, while others can stop at any time.

Psychology

Addiction usually arises as an attempt to **alleviate inner distress**. The root causes can include childhood trauma, chronic stress, or anxiety. When individuals lack psychological coping tools to **manage emotional pain** or everyday challenges, the substance assumes that role. In the short term, it acts like a chemical bandage for a psychological problem. People with undiagnosed conditions such as ADHD are especially prone to seeking this balance unconsciously. While they initially experience an illusion of control, the brain quickly unlearns how to navigate crises independently. In the long run, this form of self-medication steadily erodes emotional resilience.

Sociology

Human beings need stable relationships, a secure environment, and a meaningful perspective on life. Where this foundation is lacking—due to poverty, isolation, or difficult family circumstances—the risk of problematic substance use increases significantly. Additional factors include **peer pressure** during adolescence or easy availability within one's living environment. Genuine recovery therefore often requires more than just detoxification; it demands building an entirely **new social circle** and living environment. Furthermore, national drug policy plays a decisive role. Countries that rely primarily on strict criminal prosecution often push users into social isolation and obstruct access to support services. In contrast, nations that prioritize decriminalization and public health make medical and social reintegration considerably easier for those affected.



left: Prof. Dr. Nora Volkow discovered that drugs cause dopamine levels in the brain to spike 5 to 10 times higher than natural rewards do. In response, the brain reduces its binding sites (dopamine D2 receptors) as a protective mechanism. In individuals with substance dependence, an average of 20% of these receptors are permanently depleted.

The Chart was made with help from AI, data source: “Volkow ND, et al.. Dopamine in drug abuse and addiction: results from imaging studies and treatment implications. doi: 10.1038/sj.mp.4001507”

Two sides of Drug Policy

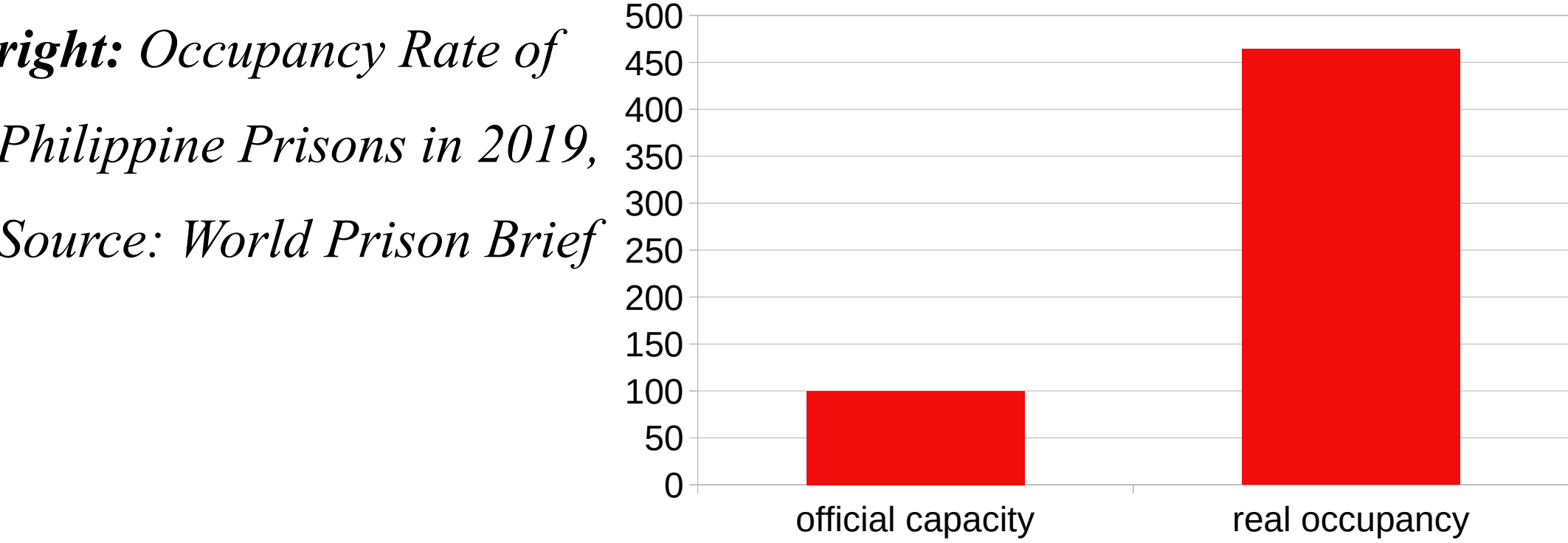
Societies worldwide face the challenge of regulating psychoactive substances. Over the past few decades, two opposing political paradigms have emerged: the "War on Drugs," aimed at the total eradication of substance use through maximum state enforcement—and the approach of decriminalization, which treats addiction primarily as a public health issue.

The Philippines: State-Led Warfare

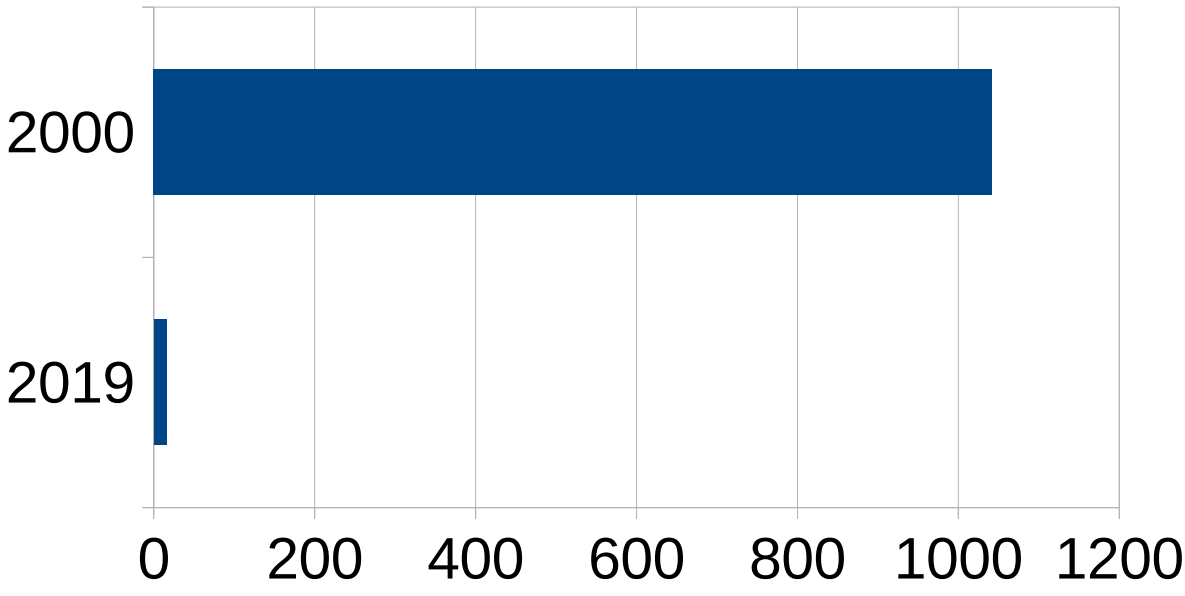
Background: In 2016, the Philippine government under President Rodrigo Duterte launched an unprecedented, radical "War on Drugs." The objective: the total physical eradication of the illicit drug market through maximum state repression and militarized force.

Measures: Users and low-level dealers were publicly branded as enemies of the state. Police and paramilitary units were granted sweeping authority to carry out extrajudicial killings without due process, evidentiary proceedings, or trials. Anyone suspected of possessing or using substances faced acute life-threatening danger.

Results: Human rights organizations estimate the death toll in the tens of thousands, predominantly from the poorest sectors of society. Philippine prisons are drastically overcrowded, and the regular justice system has locally collapsed. Despite this unprecedented brutality and profound societal trauma, the drug trade was not eradicated. Instead, the illicit market was driven further underground, while corruption within law enforcement agencies rose significantly.



right: HIV Transmissions attributed to drug Injections in Portugal, before (2000) and after decriminalization (2019), Source: SICAD Portugal



Portugal: the Public Health Reform

Background: In the late 1990s, Portugal faced Europe's most severe heroin crisis. Approximately one percent of the population was dependent, and HIV transmission rates were soaring. In 2001, the country chose a paradigm shift: the decriminalization of all illicit drugs for personal use.

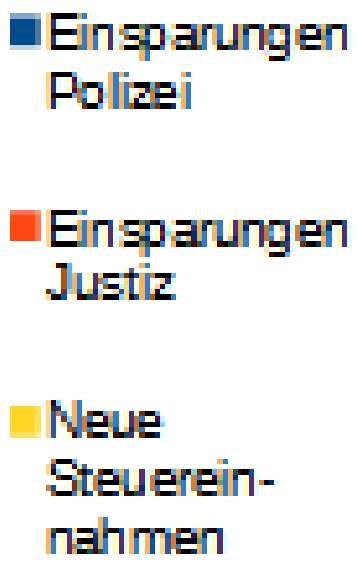
Measures: Today, anyone caught in Portugal with quantities designated for personal consumption is not sent to prison. Instead, they are summoned before a "Commission for the Dissuasion of Drug Addiction," composed of medical professionals, psychologists, and social workers. The substantial public funds previously spent on policing and courts were systematically redirected toward prevention, treatment facilities, and safe substitution therapies.

Results: The surge in consumption feared by critics never materialized; in fact, the rate of drug use among adolescents declined. Drug-induced deaths and new HIV infections linked to contaminated needles dropped to some of the lowest levels in the entire EU. Law enforcement and the judiciary were significantly relieved of administrative burden, enabling them to refocus resources on combating organized crime.

Semi-Legalization in Germany 2024

left: in 2021 economist Prof.

Haucap calculated 4,7 Billion Euro in possible tax increases due to a cannabuis legalization. source: Uni Düsseldorf, "Dice Studie"



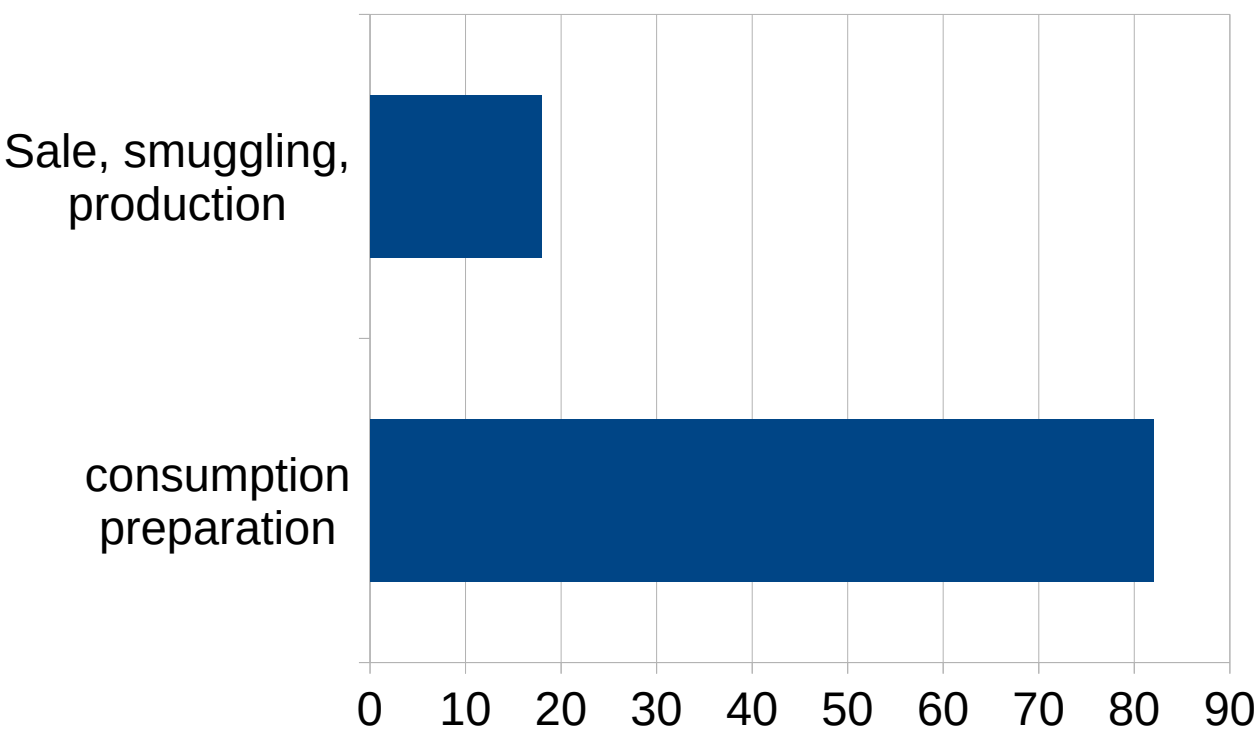
Background and Objectives

For decades, Germany pursued a repressive drug policy. Yet **reality outpaced criminal law**: despite strict prohibitions, consumption rates rose steadily. Millions of citizens were penalized for possessing minor quantities, while the **illicit black market flourished**. In April 2024, the governing coalition—comprising the SPD, the Green Party, and the FDP—responded to this systemic failure. The objective behind partial legalization was to regain state control over an unregulated market, deprive organized crime networks of their financial base, and implement genuine harm reduction.

Relieving the Judiciary

One of the reform's primary objectives was to put an **end** to the **waste of taxpayer money**. Prior to the legislative change, prosecuting simple consumers tied up enormous personnel and financial resources. Although petty offenses—such as the possession of minor quantities—were typically dropped due to insignificance, they still generated billions in administrative costs. By decriminalizing the possession of amounts intended for personal use, **law enforcement** agencies now **regain** valuable **operational capacity**.

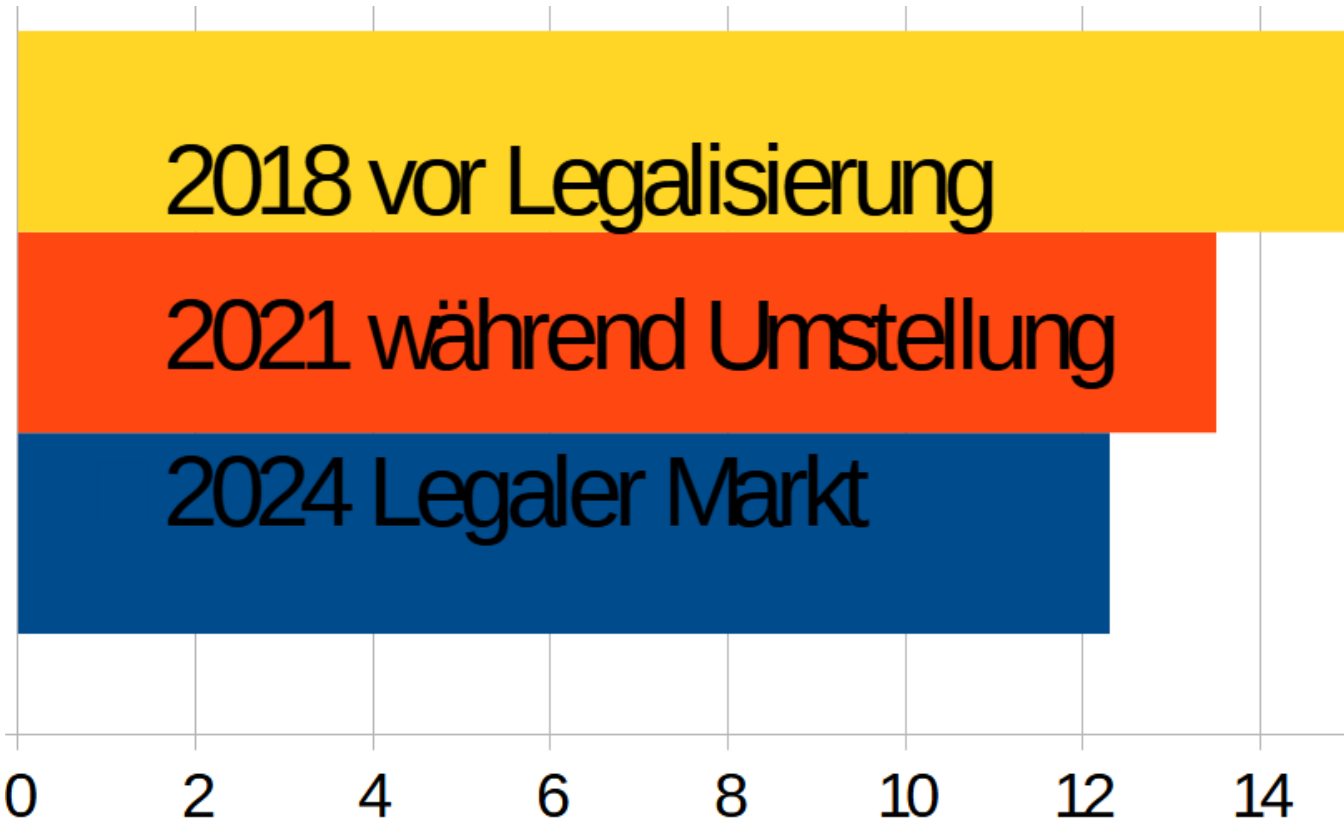
right: share of consume-related cannabis crimes in germany before the semi-legalization, source: Bundeslagebild Rauschgiftkriminalität



Consumer Protection

Prohibition did not eliminate cannabis from society; it merely relegated it to the unregulated black market, where **neither youth protection** nor quality control exists. Buds were frequently sprayed with highly dangerous synthetic cannabinoids or artificially weighed down with cutting agents. For consumers, this led to acute poisoning, psychosis, and substantial **follow-up costs for the healthcare system**. Legally regulated home cultivation and strictly monitored, non-profit Cannabis Social Clubs guarantee—for the first time—**access to clean**, uncontaminated **products** with predictable effects.

right: sinking share of Cannabis consumption among minors in Canada since 2018s full cannabis legalization Cannadian Cannabis Survey



The Black Market

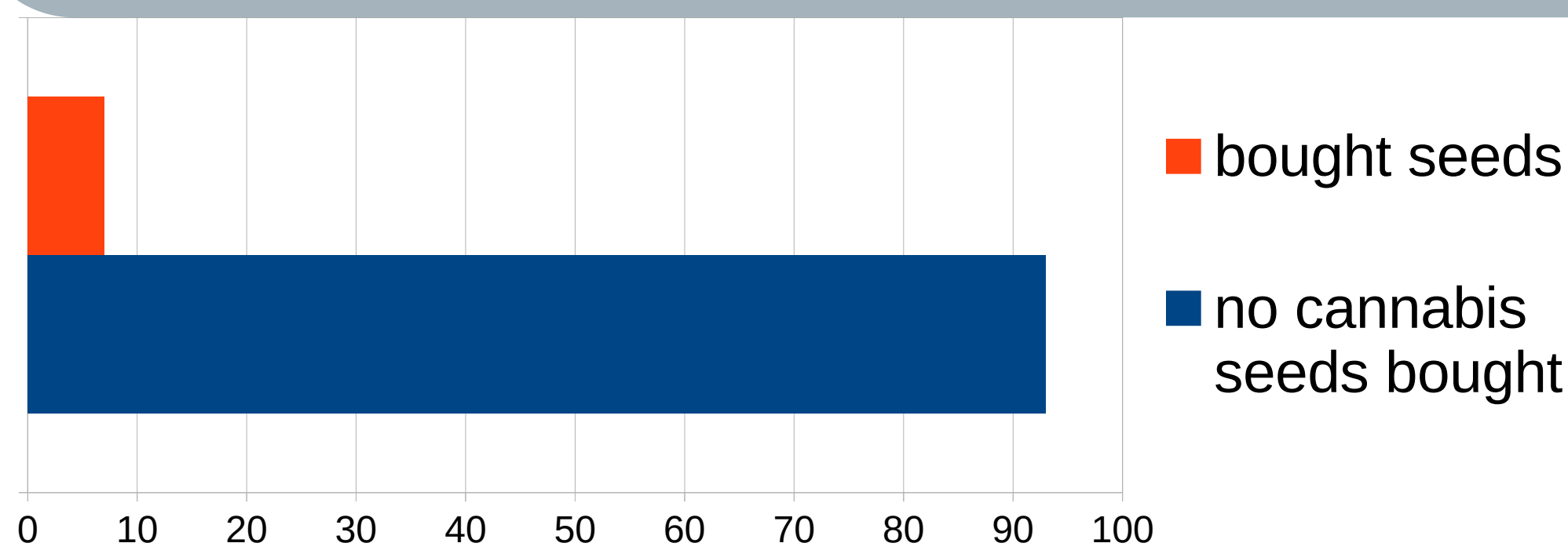
A critical mechanism in combating drug-related crime is the concept of **market separation**. When consumers are forced to purchase cannabis from illicit dealers, they are almost inevitably **exposed** to **other**, highly **addictive substances**. Conversely, sourcing cannabis transparently through a licensed, legal club or cultivating it at home completely detaches consumers from this criminal environment.

As a result, **illicit dealers lose a substantial share** of their financial foundation, physically severing the dangerous point of contact between casual cannabis users and the broader illicit drug scene.

What went wrong?

Compromise and Overregulation

The path to **partial** legalization was defined by compromise. Intended as progressive legislation to protect youth and public health, it **clashed** with **international law** and **domestic opposition**. Instead of a new start, an intricate framework emerged, marked by legal gray areas and contradictions. Criminal penalties were eased, only to be replaced by a dense web of **administrative hurdles** and micro-regulations. Ultimately, this red tape risks defeating the reform’s core goal: eliminating the illicit market.

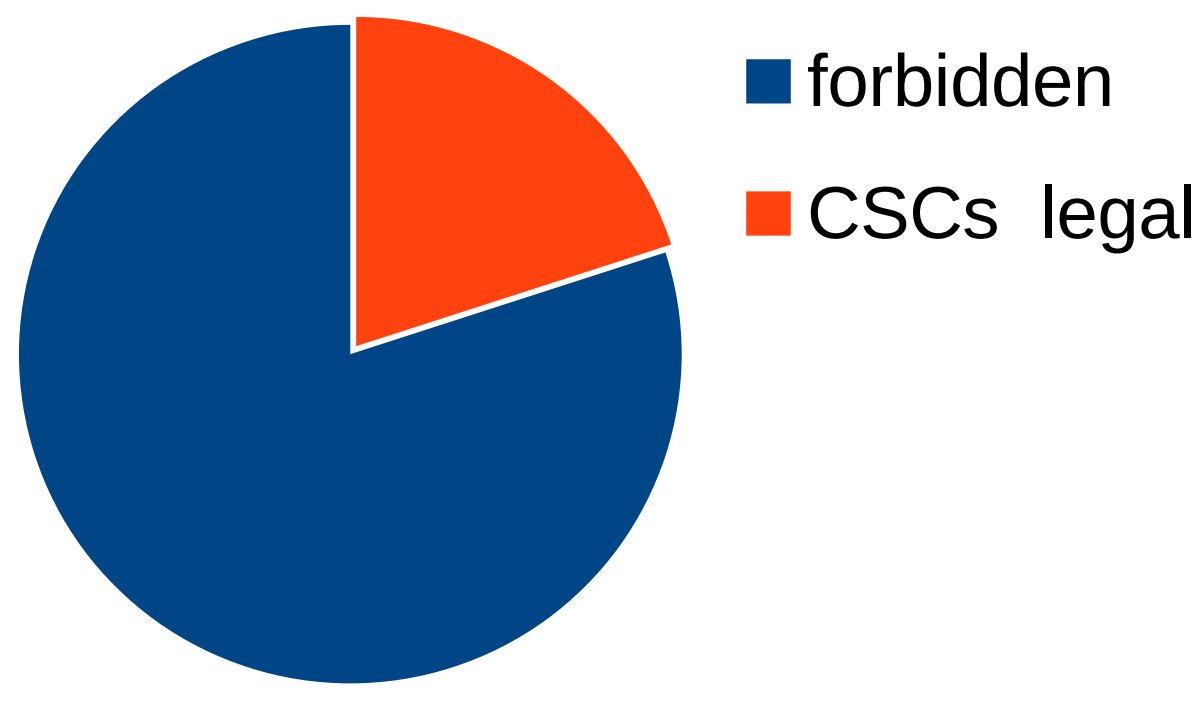


above: only 7% of survey participants bought seeds source: YouGov

Obstacles for Cultivation Associations

Cannabis Social Clubs—officially termed cultivation associations—were meant to be the cornerstone of supply. Instead, they face **crippling state requirements**. Volunteer board members must handle administrative burdens typical of specialized corporations. Strict security mandates, paired with **meticulous logging** of every gram and every member, drastically drive up costs and deter founders. At the same time, privacy concerns keep many consumers from joining in the first place.

right: in city centers like Berlin-Mitte, *only* 20% of the areas could house CSCs source: CannaZen



The Buffer Zone Patchwork

Consuming cannabis in public is forbidden within "**visual range**"—defined as a 100-meter radius around entrances to **schools, daycares, playgrounds**, and sports venues. While intended as a pragmatic safeguard for youth, enforcing this in dense urban areas has proved nearly impossible. The law created a fragmented patchwork of permitted and restricted zones, navigable only with the help of mapping apps. For police and municipal authorities, it created an unintended paradox: **rather than seeing their workload reduced**, officers must now pace out distances across parks and city centers.

Lack of licensed cannabis stores

The reform’s central flaw was sidelining commercial retail stores, originally promised in a follow-up bill that vanished when the **coalition government collapsed**. This failure leaves a major demographic behind. Occasional users and anyone reluctant to commit to formal club membership still **lack a legal retail** pathway. With home cultivation requiring considerable effort and social clubs bound by high barriers to entry, the black market continues to fill the void.

right: share of the illicit cannabis market in Canada; 2018: 100%, 2020:65%, 2023:27% source: StatisticsCanada

