



## Scientific Facts on Psychoactive Drugs

### Tobacco, Alcohol, and Illicit Substances

**Source document:**  
WHO (2004)

**Summary & Details:**  
GreenFacts

**Context** - Psychoactive drugs such as tobacco, alcohol, cannabis, amphetamines, ecstasy, cocaine, and heroin can change consciousness, mood, and thoughts. The use of these drugs imposes a substantial health burden on society.

How do psychoactive drugs affect the brain? How does drug addiction develop and how can it be treated?

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This Digest is a faithful summary of the leading scientific consensus report produced in 2004 by the World Health Organization (WHO):  
*"Neuroscience of psychoactive substance use and dependence"*

The full Digest is available at: <https://www.greenfacts.org/en/psychoactive-drugs/>

**i** This PDF Document is the Level 1 of a GreenFacts Digest. GreenFacts Digests are published in several languages as questions and answers, in a copyrighted user-friendly Three-Level Structure of increasing detail:

- Each question is answered in Level 1 with a short summary.
- These answers are developed in more detail in Level 2.
- Level 3 consists of the Source document, the internationally recognised scientific consensus report which is faithfully summarised in Level 2 and further in Level 1.

*All GreenFacts Digests are available at: <http://www.greenfacts.org/>*

## 1. What are psychoactive drugs and how much are they used?

Psychoactive drugs are substances that can alter the consciousness, mood, and thoughts of those who use them. Examples include tobacco, alcohol, cannabis, amphetamines, ecstasy, cocaine, and heroin.



Alcohol and cocaine are examples of psychoactive drugs.  
Source: WHO

**1.1 Tobacco** smoking is spreading rapidly in developing countries and among women. The average consumption of cigarettes is particularly high in Asia and the Far East, with the Americas and Eastern Europe following closely behind.

**1.2** Whereas the consumption of **alcohol** is decreasing in developed countries, it is increasing in countries of the former Soviet Union and in developing countries, especially in the Western Pacific Region.

**1.3** Worldwide, about 200 million people use some type of **illicit drug**, most commonly cannabis, but also others such as amphetamines, opioids, and cocaine. The use of illicit drugs is more frequent among males and younger people. The number of people who inject drugs is also increasing, which contributes to spreading HIV

## 2. How do psychoactive drugs affect health?

**2.1** Psychoactive drugs impose a substantial health burden on society. Tobacco and alcohol in particular are major causes of death and disability in developed countries, and the impact of tobacco is expected to increase in other parts of the world.



See also GreenFacts' Alcohol Study [see <https://www.greenfacts.org/en/alcohol/index.htm>]

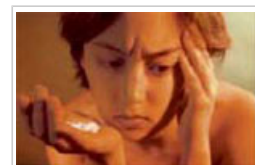
**2.2** Using psychoactive drugs, be it to find pleasure or to avoid pain, can harm health and cause social problems both in the short and longer term. Health effects can include diseases of the liver or the lungs, cancer, deaths and injuries caused by accidents, overdoses, suicide, and assaults. Examples of social effects include arrests, the breaking up of relationships, as well as neglect of work and family duties.



See also GreenFacts' Tobacco Study [see <https://www.greenfacts.org/en/tobacco/index.htm>]

## 3. How does drug addiction affect the functioning of the brain?

**3.1** Drug addiction, also referred to as drug dependence, is a disorder of the brain caused by the use of psychoactive drugs. A drug-dependent person may experience cravings for the drug and difficulty in controlling its consumption, suffer from withdrawal symptoms when use of the drug is reduced or discontinued, and need increasing doses of the drug to feel its effects (tolerance). The person may come to neglect other pleasures or interests, spend more and more time getting or using the drug or recovering from it, and persist in using the drug despite clear evidence that it is causing harm.



Psychoactive drugs affect the brain  
Source: WHO

**3.2** Psychoactive drugs affect communication between brain cells in certain regions of the brain. For instance, some drugs mimic and others block the effects of naturally occurring molecules that carry specific messages from one brain cell to another (neurotransmitters).

3.3 Based on the different ways in which they affect the brain, psychoactive drugs can be divided into four main groups: depressants (e.g., alcohol and sedatives), stimulants (e.g., nicotine and ecstasy), opioids (e.g., morphine and heroin), and hallucinogens (e.g., PCP and LSD). Despite their differences, all of them affect regions of the brain involved in motivation, which plays a role in drug dependence.

## 4. How does drug addiction develop?

4.1 The development of drug addiction can be seen as a learning process. A person takes a drug and experiences the psychoactive effect, which is highly rewarding or reinforcing, and which activates circuits in the brain that will make it more likely that the person will repeat this behaviour. The brain responds as if taking the drug was important for survival.



The development of drug addiction can be seen as a learning process  
Source: WHO

4.2 Studies show that the dependence on some drugs is significantly heritable and develops due to the interaction of several genes with other individual and environmental factors. Exposure to drugs could have a much greater effect on somebody who carries a genetic vulnerability to drug dependence than on someone who does not. Genetic differences may influence how pleasurable a drug is for an individual, to what extent it harms health, how strong the withdrawal symptoms and cravings are, and how the person develops tolerance.

## 5. Why do drug addiction and mental illness often coexist?

Drug addiction is more common among people with mental disorders than among the general population. For example, people with mental disorders are more likely to be alcohol dependent at some stage in their lives than people without a mental illness.

Conversely, drug-dependent people are more likely to suffer from mental disorders than non-dependent people. For instance, people who are dependent on alcohol, tobacco, or cocaine are more likely to suffer from depression than non-dependent people.



Individuals often suffer from drug problems in combination with depression  
Source: Patrick Jan Van Hove

This indicates either a common basis for both afflictions, or an interaction of effects at some level. Drug use may either bring about mental illness, or it may be a way of easing some of the symptoms of a mental disorder or the side effects of medication. Also, since many drugs produce effects typical of some mental illnesses, drug dependence and mental illness may have the same neurobiological causes.

## 6. How can addiction to psychoactive drugs be prevented and treated?

The most effective way to treat drug addiction seems to be a combination of medication and behavioural therapies which are a kind of psychotherapy. New and better treatments are currently being developed.

6.1 Some medications used for the treatment of drug addiction either block the effects of the drug or cause unpleasant reactions. Other substances can be used as substitutes for a drug, for instance methadone can replace heroin. Such substitutes act like the drug in some ways without inducing some of the more harmful effects.

6.2 Drug addiction can also be treated through various behavioural therapies that try to replace the motivation to use drugs with the motivation to engage in other behaviours. Such therapies aim to help people 'unlearn' their drug-taking behaviour, learn new ways to respond to cravings, and develop new skills to remain drug-free.

6.3 The rapid advances in our understanding of how the brain works brings with it a host of new ethical issues in both research and treatment of drug dependence. Biomedical research is guided by moral principles such as ensuring that the benefits to society are greater than the risks to those who consent to treatment or research participation. Ethical issues that need to be addressed include, for instance, equality of access to treatment, the potential treatment of persons without their consent, public funding for treatment of dependence, public credibility of clinical trials, and moral questions arising from animal experimentation and genetic screening.



Methadone is a medication used as a substitute for heroin  
Source: methadonetreatment.net

## 7. Conclusions

Drug use and addiction impose a substantial health burden on society. Recent advances in brain research may help to find ways to reduce that burden.

Aspects that should be taken into account to ensure effective actions include:

1. The health impact of drug use depends on the type of drug and the way it is used (amount, frequency, etc.).
2. The greater a person's drug use, the higher the risk of becoming dependent.
3. Effective public health programmes can reduce the overall health burden of drug use.
4. Dependence is caused by many factors and it is currently impossible to predict who will become drug dependent.
5. Drug dependence is a medical disorder that could affect anyone and that can be treated.
6. Drug dependence and mental illness often affect the same individuals.
7. Beyond stopping drug use, effective treatment requires changes in the behaviour of users and often the use of substitute drugs.
8. Treatment must be accessible to all in need.
9. Prejudice and discrimination against drug dependent people is one of the main barriers to their treatment.
10. Brain research should continue to help devise effective ways to reduce the harm caused by drug use and dependence.

Recent advances in the treatment of drug dependence raise difficult ethical issues that must be addressed.

## Partner for this publication

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