

# Alcohol

## Introduction

Ethyl alcohol, or ethanol, is produced by the fermentation of yeast, sugars and starches, and is the intoxicating ingredient of beer, wine and spirits. It is a central nervous system depressant that is rapidly absorbed into the bloodstream from the stomach and small intestine. Alcohol is metabolised in the liver by enzymes but the liver can metabolise only a small amount of alcohol at a time, leaving the excess alcohol to circulate throughout the body. The blood alcohol concentration depends on the amount of alcohol consumed and the body weight, particularly the percentage of body weight that is water.

The intensity of the effect of alcohol on the body is directly related to the amount consumed, although this can vary from person to person.

People have been consuming alcohol in one form or another for centuries. Alcohol can initiate a general feeling of well-being and can help people feel relaxed. When the quantity of alcohol consumed increases, however, these effects become counterbalanced by other effects, including loss of motor skills, slower reaction times and drowsiness. Studies have claimed that there are health benefits to drinking alcohol but more recent evidence states that some of the benefits have tended to be overestimated.

## Health effects of alcohol

### Short-term effects

The brain is the first organ to be affected by alcohol. Alcohol dampens the brain's arousal, motor and sensory centres, and affects coordination, speech, cognition and the senses. The first effects are the impairment of fine motor skills (the skills needed for writing, weaving, wood carving etc.) and the weakening of inhibitions.



Alcohol also affects the pituitary gland at the base of the brain, which in turn suppresses the production of the hormone that keeps the body's fluid reserves in balance. When a person drinks too much alcohol, their kidneys are unable to reabsorb an adequate amount of water, and their body excretes more water than it takes in, leaving that person dehydrated and with a headache.

### Long-term effects

Those who drink regularly may acquire a degree of tolerance towards alcohol because the liver becomes more efficient at breaking down alcohol. Despite this tolerance, the long-term effects remain damaging and a number of diseases and disorders are associated with alcohol consumption.

Alcohol affects many organs in the body, most notably the liver, causing cirrhosis (scarring which



damages liver function), the digestive tract and pancreas (causing inflammation and diarrhoea), and the heart and circulatory system.

**The heart, circulatory system and alcohol.** The relationship between alcohol consumption and the heart and circulatory system is complex. Low levels of alcohol intake raise high-density lipoprotein (good) cholesterol and reduce plaque accumulation in arteries. Alcohol also has a mild anti-coagulating effect on the blood, keeping platelets from clumping together to form clots and thus potentially reducing the risk of heart attack and ischaemic stroke (when an artery carrying blood to the brain is blocked). However, at higher levels of intake, alcohol raises blood pressure and may increase the risk of arrhythmias (irregular heartbeat), shortness of breath, cardiac failure, haemorrhagic stroke (when a blood vessel ruptures and bleeds into the brain) and other circulatory problems.

**Cancer and alcohol.** Alcohol is associated with an increased risk of cancer overall, and is a direct cause of cancer of the mouth, throat, larynx and oesophagus. Alcohol is also a risk factor for other cancers, such as cancer of the stomach, breast, liver and pancreas, and has been associated with bowel cancer.

**Mental health and alcohol.** Although a small amount of alcohol may bring short-term relief from stress, sustained drinking increases anxiety levels, and may lead to dependence when stress is ongoing. Alcohol consumption increases the risk of mental illness (e.g. depression) in people who are already prone to these conditions.

**Other effects.** While this is not an inclusive list, other effects include poor quality sleep, a range of sexual problems (particularly male impotence), and eye problems (including cataracts and age-related macular degeneration). Alcohol adds energy intake (kilojoules) to the normal diet and may also further increase energy intake and fat storage by increasing the appetite and displacing fat and carbohydrate oxidation.

## Social harms of alcohol

### Aggression and violence

Alcohol consumption increases the likelihood and extent of aggressive behaviours, thereby increasing the risk of injury and trauma. Impaired cognitive or verbal capacity reduces a person's ability to resolve conflict, making physical violence a likely outcome. Violence between partners is positively associated with heavy drinking. Some estimates indicate that,





in at least half of all domestic, physical and sexual violence cases, the perpetrator had been drinking before the violence occurred. Alcohol is also associated with child abuse.

## Risk-taking

The relationship between alcohol consumption and risk-taking is well established, but complex. Research with young people consistently shows a strong dose-response relationship between binge drinking and risky behaviours, including riding in a car with an intoxicated driver and using illicit drugs. The likelihood of road accidents, falls, drownings, burns and firearm injuries increases as alcohol consumption rises.

Alcohol consumption is also associated with sexual promiscuity. Observational studies have shown that: a) alcohol intoxication increases the likelihood that people will engage in unprotected sex; and b) intoxicated individuals are less likely to discriminate between low-risk and high-risk partners when choosing to have unprotected sex.

## Self-harm and suicide

Alcohol use is significantly associated with episodes of deliberate self-harm. A recent multi-centre study found that alcohol was involved in more than half of all self-harm cases at emergency departments in the United Kingdom (Kapur, Murphy & Cooper et al. 2008). Heavy drinking is a major risk factor for suicide and suicidal behaviour in both men and women in the general population, and is strongly associated with enhanced risk in people with psychiatric illnesses.

In middle age, there appears to be a 'u-shaped' relationship between alcohol use and suicide, with non-drinkers and regular heavy drinkers at the greatest risk, and occasional drinkers at the lowest risk of suicide (Akechi, Iwasaki & Yosuke et al. 2006).

## What is a standard drink?

The definition of a standard drink, or unit, varies from country to country. The Australian alcohol guidelines define a standard drink as one that contains 10 g of alcohol (equivalent to 12.5 ml of pure alcohol). In the UK, a standard drink is 8 g (or 10 ml of pure alcohol), whereas in Japan a standard drink is 19.75 g (25 ml of pure alcohol). In the USA a standard drink is equal to 13.7 g (or 0.6 ounces of pure alcohol).

The term standard drink should not be confused with a serving of alcohol, which is often larger. For example, a standard drink of wine corresponds to 100 ml, whereas a typical serving may be more like 130 ml because glass sizes vary. In many countries, all bottles, cans and casks containing alcoholic beverages are required by law to state on the label the approximate number of standard drinks contained therein.

## Weekly and daily limits

Some countries have established daily and/or weekly drinking limits. In cases where weekly limits are suggested, daily intake may be higher than one-seventh of the weekly limit and some days may be 'alcohol free' days.

Daily limits vary widely from country to country.

### For men:

In Australia in 2009, the daily maximum was set at two standard drinks (i.e. 20 g of alcohol) or fourteen drinks a week (140 g of alcohol). Some European countries have set their daily limit higher: Austria and the Czech Republic at 24 g/day, Portugal at 37 g/day and Italy at 40 g/day. Most countries are somewhere between 20 g/day and 40 g/day. For weekly maximums, similar variations are evident. Limits typically range from 14–21 units a week (168–210 g). A few countries have opted for a 28-unit weekly maximum.





## For women:

In Australia, the daily maximum has been set at two standard drinks (i.e. 20 g) or fourteen drinks a week (140 g). Other countries have different daily limits for women. For example, Italy has a 30 g/day limit, whereas Austria has a 16 g/day limit. Generally, the limits range from 16–30 g/day. Common weekly maximums for women range from around 98–140 g of alcohol per week, which is significantly less than for men.

Daily limits are often preferred to weekly limits. In the case of the UK, the advice has been that men should drink no more than 21 units per week, and women no more than 14 units. This recommendation was changed because a government study showed that many people were saving up their units and using them at the end of the week (i.e. they were binge drinking). The recommendation from the UK now reads 'Regularly drinking above the recommended daily limits for lower risk drinking of 2–3 units for women and 3–4 units for men, significantly increases the risk of ill health'.

In the absence of specific guidelines for the Pacific, SPC currently recommends a daily maximum of two standard drinks (i.e. 20 g of alcohol) or fourteen drinks a week (140 g of alcohol) for both men and women.

## Pregnancy, breastfeeding and alcohol

### Pregnancy

Alcohol can enter the bloodstream of an unborn child, and excessive drinking during pregnancy is the cause of foetal alcohol syndrome (mental and physical defects that can develop in a foetus when a pregnant woman drinks alcohol, especially in the first eight to twelve weeks of pregnancy).

Heavy drinking episodes and occasional peak blood alcohol levels can also increase the risk of miscarriage, low birth weight, cognitive defects and congenital malformations. Given that there is no known safe level of alcohol consumption at any stage during pregnancy, most countries advise women to refrain completely from drinking alcohol during pregnancy or if planning a pregnancy.



Photo: Chris Paethorpe

### Breastfeeding

Alcohol has been found in the breast milk of mothers who drink alcohol, and this has been associated with an increase in sudden infant death syndrome (SIDS). Alcohol is passed to the baby in small amounts in breast milk and can alter its taste. Although there is little research about the wider effects of alcohol in breast milk, it may – even at low levels of consumption – reduce the amount of milk available, cause irritability, disrupt feeding and cause sleep disturbance in the infant. Generally, women are advised to abstain from drinking alcohol when they are breastfeeding because there is no safe consumption level.

### Alcohol and minors

Countries have different laws concerning the purchase of alcohol by minors and the administration of alcohol to minors by adults. In the UK, for example, children under the age of 15 must never be given alcohol, even in small quantities, and children aged 15–17 years must not be given alcohol on more than one day a week — and even then, only under supervision from care-givers or parents.

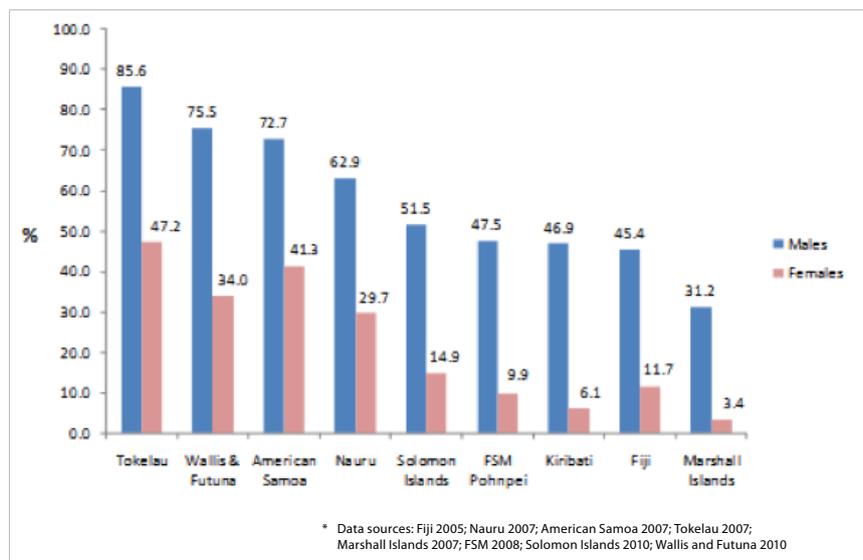




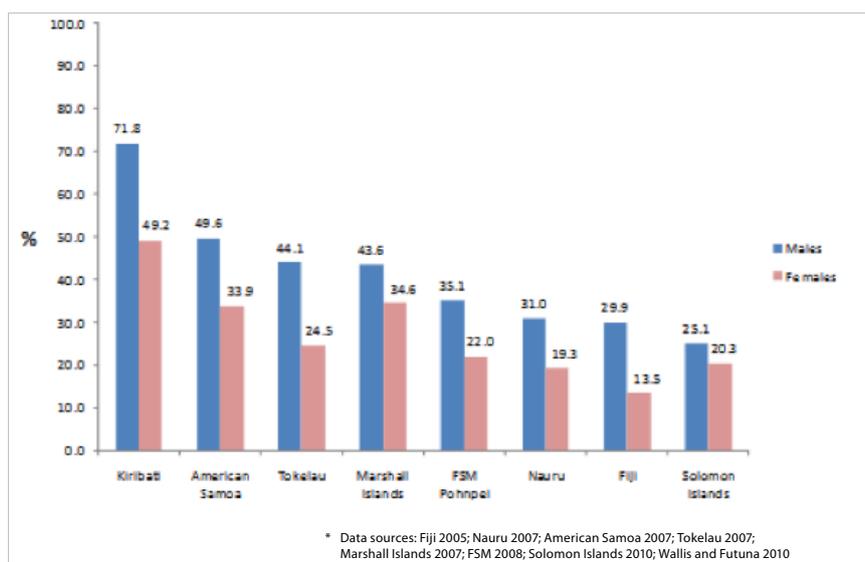
## Pacific alcohol data

Data on alcohol consumption in the Pacific region are limited. The World Health Organization's STEPwise approach to surveillance is one source of data on drinking and binge drinking in the Pacific, and Tables 1 and 2 provide an indication of the situation in selected Pacific Island countries and territories (PICTs) where data are available. The data show why drinking, particularly excessive or binge drinking, is of concern in the western Pacific region; and drinking by young people is on the increase, with the age of initiation occurring at younger and younger ages. Binge drinking among young people is also a matter of grave concern.

**Table 1: Percentage of the population aged 25–64 years who drink alcohol in selected PICTs**



**Table 2: Percentage of the population aged 25–64 years who binge drink in selected PICTs**





## Glossary of key terms

### Alcohol dependence

Alcohol is an addictive drug and regular use can result in alcohol dependence. Alcohol dependence is complex. In brief, it refers to situations where a person feels a strong need to drink so that drinking is given priority over other behaviours that the person had previously found more important. Dependence ranges from mild to severe. People with severe alcohol dependence regularly drink above guideline levels, often find it hard to limit how much they drink, and generally have marked tolerance to the effects of alcohol. If they stop drinking for a few hours, they feel shaky and anxious.

### Binge drinking

The term binge drinking is commonly used but can be confusing. It was formerly used to refer to an extended period (usually more than a day) devoted to drinking alcohol at levels leading to intoxication. However, more recently, the term has been used to describe single-occasion drinking of a substantial amount of alcohol, particularly by adolescents and young adults.

According to the US National Institute on Alcohol Abuse and Alcoholism website, binge drinking is defined as a pattern of alcohol consumption that brings the blood alcohol concentration (BAC) level to 0.08% or above. This pattern of drinking usually corresponds to five or more drinks on a single occasion for men, or four or more drinks on a single occasion for women, generally within a period of about two hours.

### Blood alcohol limit or blood alcohol content/concentration

For purposes of law enforcement, BAC is used to define intoxication and provide a measure of

impairment. BAC is the concentration of alcohol in a person's blood, and is the most commonly used measure of intoxication for legal and medical purposes. It is usually expressed in terms of volume of alcohol per volume of blood in the body (usually expressed as a fractional percentage, such as 0.82%). The number of drinks consumed is an unreliable measure of BAC, largely because of variations in the weight, sex and body fat of consumers.

The alcohol level at which a person is considered to be legally impaired varies from country to country. Many countries typically have BAC limits for operating a vehicle, and these limits also vary. The BAC limit for drivers in most of Australia is 0.05% but 0.00% (zero tolerance) for learner drivers. In OECD (Organization for Economic Cooperation and Development) and European Union countries, there is a limit of 0.025% for learner drivers. In the UK, the BAC limit is 0.02% for operators of fixed wing aircraft, and in the USA it is 0.01% for operators of common carriers such as buses, and 0.019% for pilots.

Establishing BAC limits is recommended for the Pacific region. Some PICTs have set the limit at 0.08 g/100 ml (0.08%) although a lower level of 0.05 g or less has been recommended elsewhere.

### Breath alcohol content

Breath alcohol content (BrAC) is different from blood alcohol content. BrAC is the volume of alcohol per volume of exhaled breath (e.g. 0.08 ml/l). In the UK, for example, the BrAC limit is 35 micrograms of alcohol per 100 ml of breath.

### Zero tolerance

A zero tolerance law makes it illegal to have any alcohol in your blood when driving a vehicle or operating machinery.





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