

# Alcohol

## A major preventable cause of cancer

International Agency for Research on Cancer



IARC Evidence Summary Brief No. 6

### Introduction

Alcohol consumption is a major public health concern, in part due to its well-established role in increasing cancer risk. In 1988, the *IARC Monographs* programme classified alcoholic beverages as carcinogenic to humans (Group 1).

Alcohol consumption has increased over the past 20 years in several world regions, including the Americas, the Western Pacific, Africa, and South-East Asia, and is currently highest in Europe. Yet, despite the known health risks of alcohol consumption, less than half of the population in Europe is aware of the link between alcohol and cancer.

Drinking alcohol increases the risk of cancers of the mouth, pharynx, larynx, oesophagus, liver, colorectum, and female breast. All types of alcoholic beverages – beer, wine, and spirits – can

cause cancer. Alcohol causes cancer through mechanisms such as genotoxicity caused by acetaldehyde, the first metabolite of ethanol; DNA damage due to oxidative stress; increased levels of sex hormones; and altered microbiome composition and intestinal permeability. Alcohol also acts

as a solvent, facilitating the absorption of other carcinogens.

This Evidence Summary Brief brings together prominent findings from IARC-led research on the global burden of cancer due to alcohol, its economic impact, and effective interventions to reduce this burden.

### Key evidence messages

- Drinking alcohol increases the risk of at least seven cancer types and causes an estimated 4% of all new cancers globally per year.
- Even low levels of drinking increase cancer risk.
- Deaths from cancer attributable to alcohol cost about €4.6 billion in lost productivity in the European Union per year.
- Reducing or quitting alcohol consumption reduces the risk of alcohol-related cancer.
- Policies that increase taxes or prices, decrease availability, or restrict marketing of alcoholic beverages are effective in lowering alcohol consumption if they are properly implemented and enforced.

## Call to action



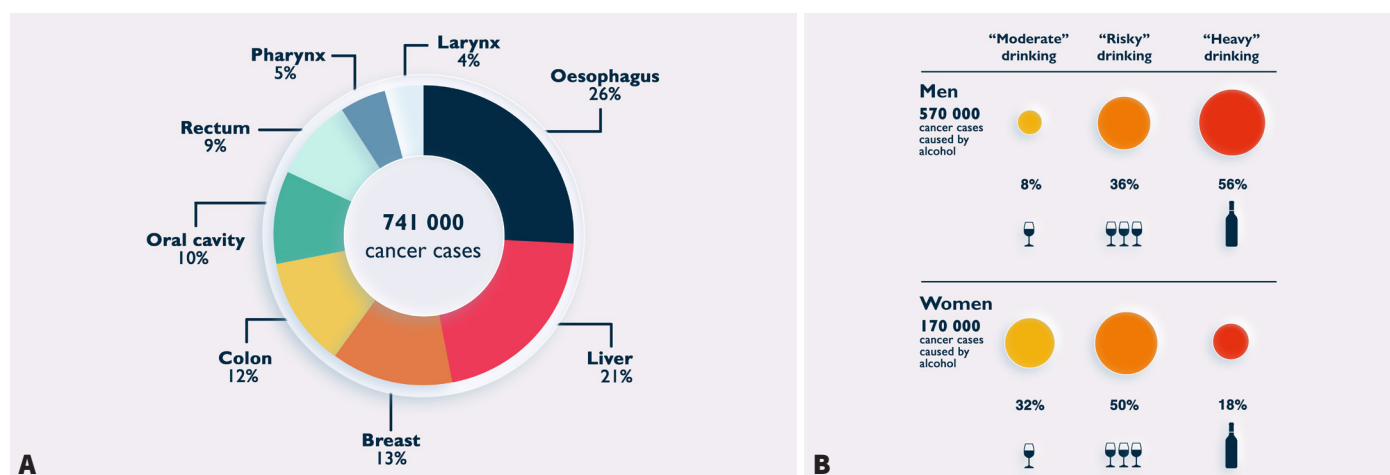
**Governments must prioritize implementation of effective policies to reduce alcohol consumption.**



**Scientific communities must engage with advocacy groups and the media to increase awareness about the link between alcohol and cancer and emphasize that there is no safe level of drinking.**



**Everyone must play a role in changing the currently accepted norms and values in relation to alcohol drinking, including governments, policy-makers, health professionals, nongovernmental organizations, and advocacy groups.**



**Fig. 1** Estimates of the global burden of cancer attributable to alcohol consumption according to (A) cancer type and (B) level of average daily alcohol intake.



*“Alcohol consumption is a cause of more than 200 diseases and injuries, including cancer. Let’s take action to reduce their burden.”*

– Dr Béatrice Lauby-Secretan,  
Evidence Synthesis and Classification Branch, IARC

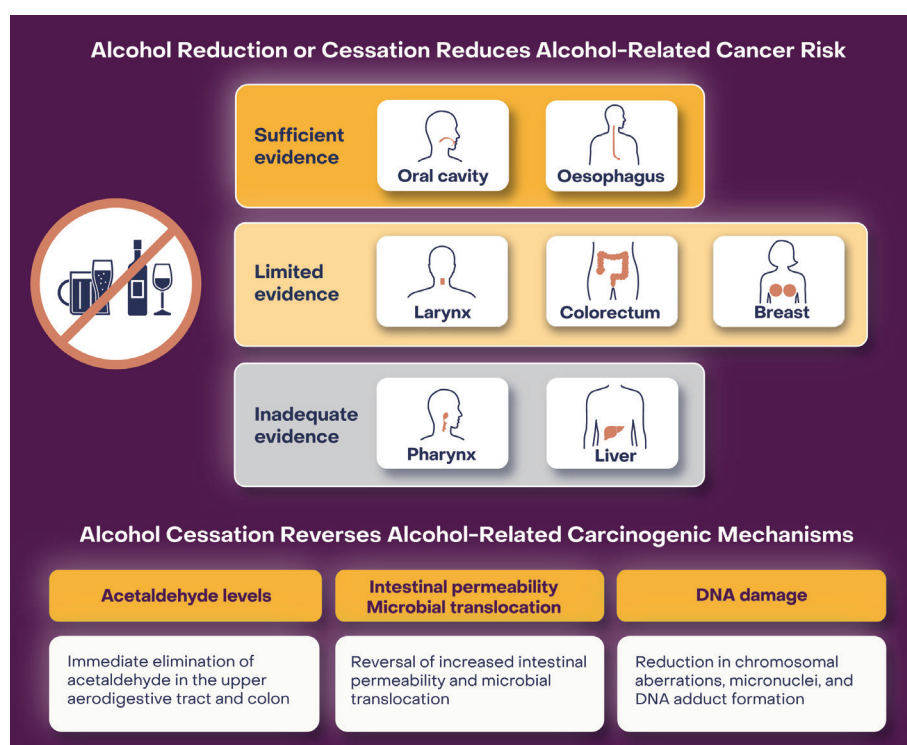
### Global burden of cancer due to alcohol

IARC scientists estimated that 741 000 new cases of cancer, or 4% of all new cancers globally, were attributable to alcohol consumption in 2020. Men accounted for the large majority (78%) of the total alcohol-attributable cancer burden. The cancer types with the

most cases attributable to alcohol consumption were oesophageal cancer (190 000 cases), liver cancer (155 000 cases), and female breast cancer (98 000 cases) (see Figure 1A). In terms of the geographical distribution, the proportions of all new cancer cases that were attributable to alcohol consumption were highest in men

in Eastern Asia (9%) and Central and Eastern Europe (8%) and in women in Central and Eastern Europe (3%), Australia and New Zealand (3%), and Western Europe (3%), and lowest in men and women in Northern Africa and Western Asia (< 1%).

When the scientists looked at the cancer burden due to different levels of alcohol consumption, “risky” drinking (2–6 alcoholic drinks per day) and “heavy” drinking (> 6 alcoholic drinks per day) represented the most cases (39% for “risky” and 47% for “heavy”) (see Figure 1B). But the category of “moderate” drinking (< 2 alcoholic drinks per day) represented 1 in 7 alcohol-attributable cancer cases and accounted for more than 100 000 new cancer cases worldwide in 2020. Within this lowest category of drinking, consumption of less than 1 alcoholic drink per day caused an estimated 41 300 new cancer cases in 2020.



**Fig. 2** Strength of the evidence on the cancer-preventive effect of reducing or quitting alcohol consumption (IARC Handbooks Volume 20A).

### Economic impact of cancer deaths due to alcohol

IARC scientists estimated that deaths from cancer attributable to alcohol cost about €4.6 billion in lost productivity in the European Union plus Iceland, Norway, Switzerland, and the United Kingdom in 2018. This was nearly 0.03% of the combined gross domestic product

(GDP) of the 31 European countries. Each cancer death due to drinking alcohol cost about €196 000 in lost productivity.

This represents an underestimate of the true cost of cancer caused by drinking alcohol. The true cost could be substantially higher if other costs were incorporated, including productivity losses in unpaid employment, income lost through potential time off from work or reduced working hours due to cancer symptoms or treatment, productivity losses among cancer caregivers such as family members while they accompany cancer patients during their treatments, and the actual cost of diagnosing and treating patients before death from cancer.

Although the true economic impact of alcohol-attributable cancers is currently unknown, it is clear that implementing and enforcing cost-effective strategies to prevent alcohol-attributable cancer deaths could result in economic benefits for society.

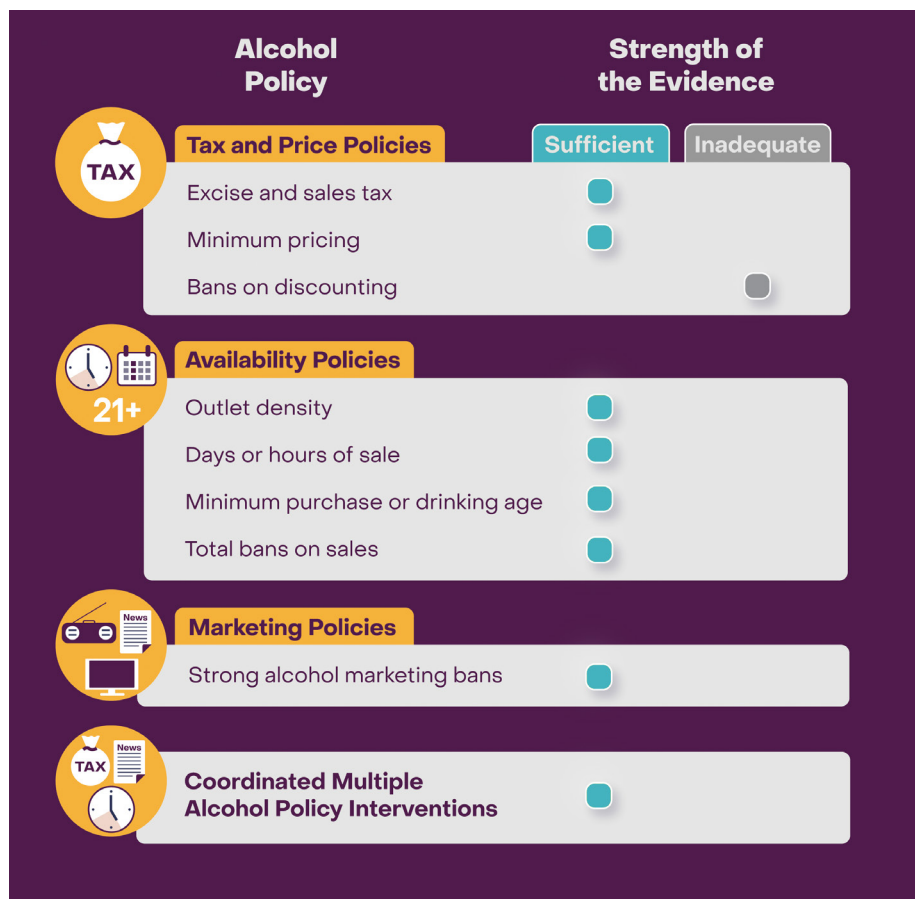
### Reducing alcohol consumption prevents cancer

In 2023, IARC organized for international experts to review and evaluate the evidence on the effectiveness of reducing or quitting alcohol consumption in preventing cancer. The experts concluded that, compared with continued alcohol consumption, reduction or cessation of alcohol consumption reduces the risk of developing cancer of the oral cavity and of the oesophagus (see Figure 2). In studies of individuals who quit alcohol consumption, the risk of these two cancer types decreased with time since quitting. The effect of alcohol reduction or cessation is less clear for the other alcohol-related cancer types (i.e. cancer of the pharynx, larynx, liver, colorectum, and female breast).

Three biological mechanisms were identified through which the damage caused by alcohol is reversed upon cessation (Figure 2): rapid decrease and elimination of alcohol-related acetaldehyde in the upper aerodigestive tract and colon; reversal of alcohol-related damage to the intestines and changes to the gut microbiome; and decrease in DNA alterations and DNA damage.

### Effective alcohol policies

In 2024, IARC brought together a group of international experts to review and evaluate the evidence on the effectiveness of selected alcohol policies in reducing consumption of alcoholic



**Fig. 3** Strength of the evidence on the effectiveness of alcohol policies in reducing alcohol consumption (IARC Handbooks Volume 20B).



*“Reducing alcohol intake reduces cancer risk. There is no amount of alcohol intake that is entirely without risk.”*

– Dr Harriet Rumgay,  
Cancer Surveillance Branch, IARC

beverages at the population level (see Figure 3). The experts concluded that the following alcohol policy interventions lead to a reduction in alcohol consumption at the population level:

- interventions that increase taxes, set minimum prices, or raise the minimum legal purchase or drinking age for alcohol;
- interventions that reduce alcohol outlet density or days or hours of sale;
- strong bans on alcohol marketing;
- total bans on alcohol sales;
- government alcohol monopolies or other coordinated multiple alcohol policy interventions.

Almost all countries that allow alcohol sales apply national-level excise taxes and a minimum legal age to purchase or drink alcohol, although alcohol tax rates are still very low in many countries.

Other effective alcohol policies are currently less common. Generally, low-income countries are less likely to have implemented specific alcohol policies compared with medium- and high-income countries.

The World Health Organization (WHO) launched the SAFER initiative in 2018; “SAFER” is an acronym for the five most cost-effective interventions to reduce alcohol-related harm. Along with taxation and pricing, reducing availability, and banning marketing of alcoholic beverages, facilitating access to screening, brief interventions, and treatment and enforcing drink-driving countermeasures are the remaining interventions in the WHO SAFER strategies that can help governments reduce alcohol consumption and detrimental related health, social, and economic consequences.

## Implications for policy

- Civil society, governments, and the alcohol industry each play a part in influencing alcohol consumption. Importantly, the alcohol industry drives consumption through product development and marketing, often outpacing policy responses. In addition, when industry involvement in research is not transparently disclosed, it can distort the evidence base, create confusion, and lead policy-makers to underestimate the true scale of alcohol-related harm.
- Given the substantial cancer burden due to alcohol, there is a need for the implementation and enforcement of policies that are effective in reducing consumption of alcoholic beverages at the population level.
- Increasing awareness of the causal link between alcohol and cancer is fundamental to enable consumers to make informed decisions about the associated risks, through improved labelling and health warnings and empowering health-care professionals to address alcohol drinking.

### Increasing alcohol excise taxes to prevent cancer

Although policy interventions that increase alcohol taxes and set minimum prices are both effective in reducing alcohol consumption, increasing excise taxes has the advantage of increasing government revenues rather than those of the alcohol industry.

A modelling study in collaboration with IARC scientists indicated that increasing excise duties on alcoholic beverages is likely to reduce the alcohol-attributable cancer burden in Europe. Within the region, 6% of new alcohol-attributable cancer cases and 6% of alcohol-attributable cancer



*“Alcohol policies that increase taxes or prices, decrease availability, or restrict marketing are effective in reducing alcohol consumption.”*

– Dr Daniela Mariosa,  
Evidence Synthesis and Classification Branch, IARC

deaths could have been avoided in 2019 if excise duties were increased by 100%, and the greatest reductions were estimated for female breast cancer and colorectal cancer. Given the generally low levels of alcohol taxation in many

countries in Europe, increasing excise duties represents a considerable and underutilized opportunity to tackle alcohol consumption and ultimately reduce the cancer burden attributable to alcoholic beverages.

### Acknowledgements

Funding: Centers for Disease Control and Prevention (CDC), USA; American Cancer Society (ACS), USA; Institut National du Cancer (INCa), France; WHO Regional Office for Europe, Denmark.

Authors of the cited publications; Working Groups for *IARC Handbooks Volumes 20A and 20B*; *IARC Handbooks* team.

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To cite this Brief in the grey literature, please cite as follows: IARC (2025). Alcohol: a major preventable cause of cancer (IARC Evidence Summary Briefs, No. 6). Lyon, France: International Agency for Research on Cancer. Available from: <https://www.iarc.who.int/evidence-summary-briefs-series/>.

*The responsibility for the primary data lies entirely with the corresponding authors of the primary peer-reviewed publications.*



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October 2025

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