

# Alcohol and cancer

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Dublin 29 May 2013

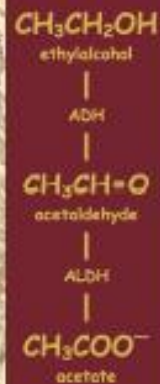
WORLD HEALTH ORGANIZATION  
INTERNATIONAL AGENCY FOR RESEARCH ON CANCER



*IARC Monographs on the Evaluation of  
Carcinogenic Risks to Humans*

**VOLUME 96**

**Alcohol Consumption and  
Ethyl Carbamate**



LYON, FRANCE  
2010

## Overall evaluation

- Alcoholic beverages *cause cancer in humans (Group 1)*
- Ethanol in alcoholic beverages *causes cancer in humans (Group 1)*
- Acetaldehyde associated with alcoholic beverages causes cancer in *humans (Group 1) (Vol 100E)*

In this presentation, we will:

1. Look in more detail at what IARC said
2. Consider the importance of alcohol-related cancers
3. Consider toxicological thresholds
4. Mention alcohol and heart disease, and thus consider alcohol's overall contribution to harm
5. Discuss actions to reduce the harm done by alcohol, including alcohol-caused cancers

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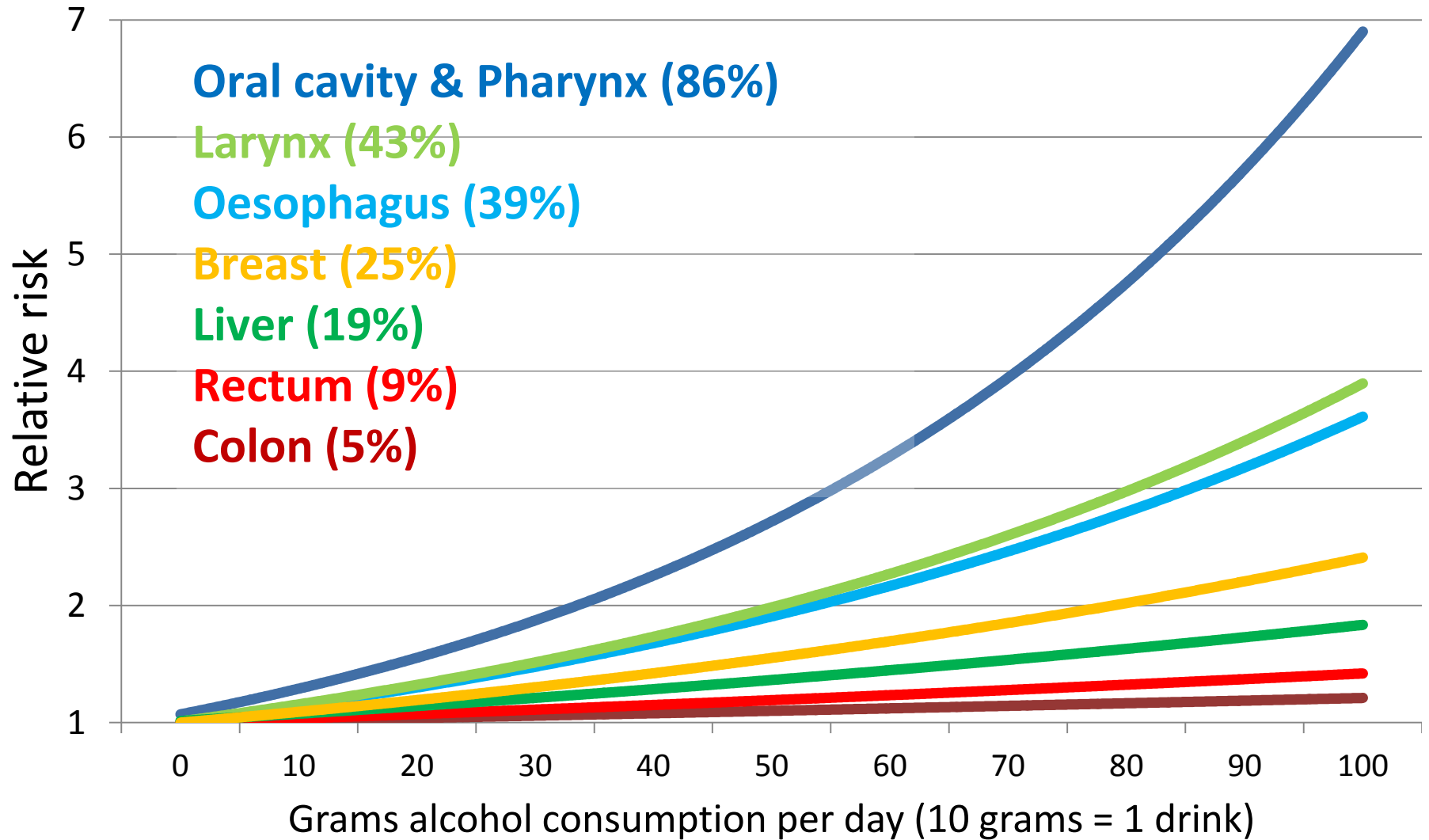
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# International Agency for Research on Cancer:

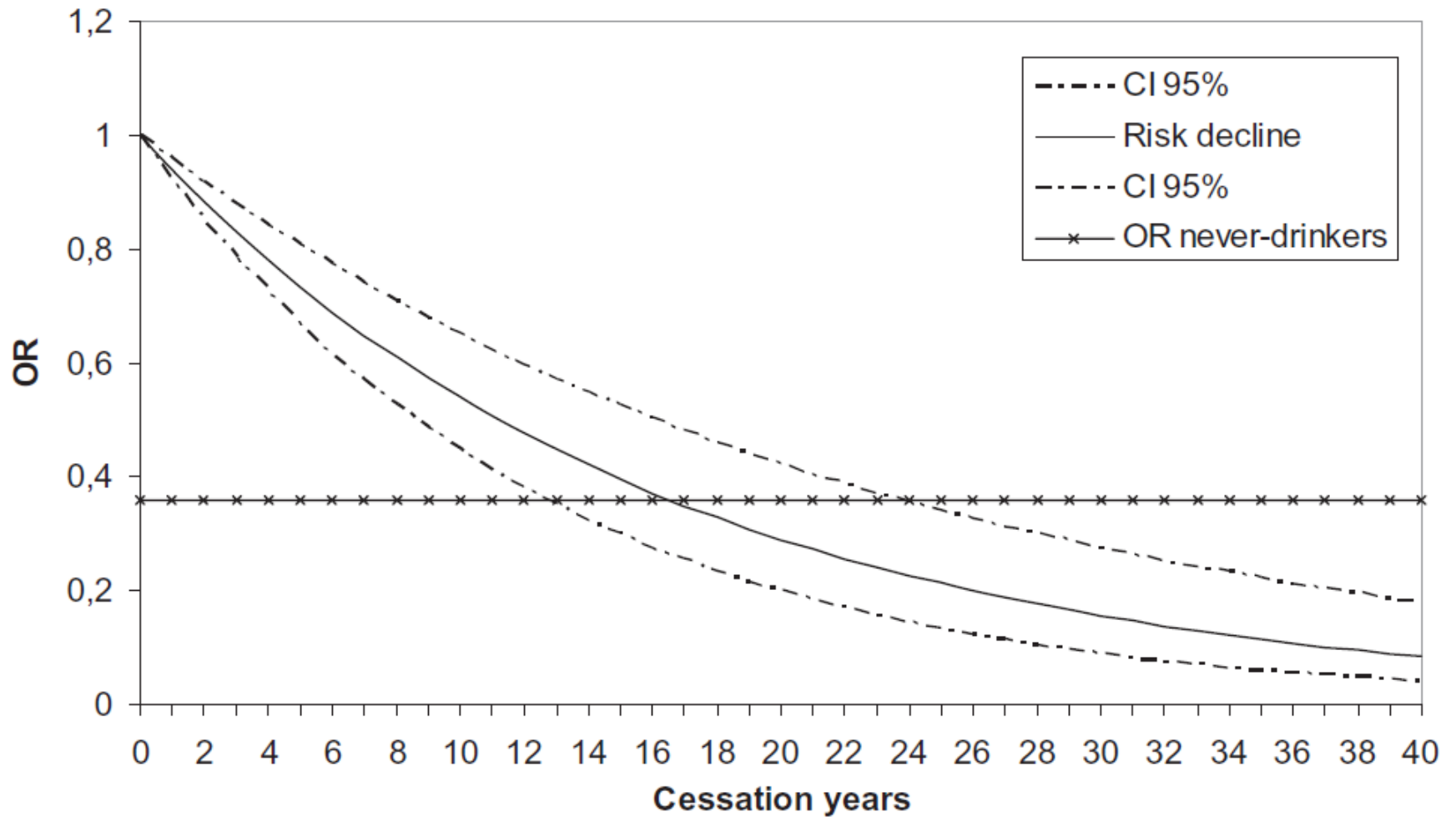
Alcohol is a causal agent for cancers of:

- Oral cavity, pharynx, and larynx
- Oesophagus
- Liver
- Colon
- Rectum
- Breast

In brackets, increased risk at 20g/day compared with not drinking



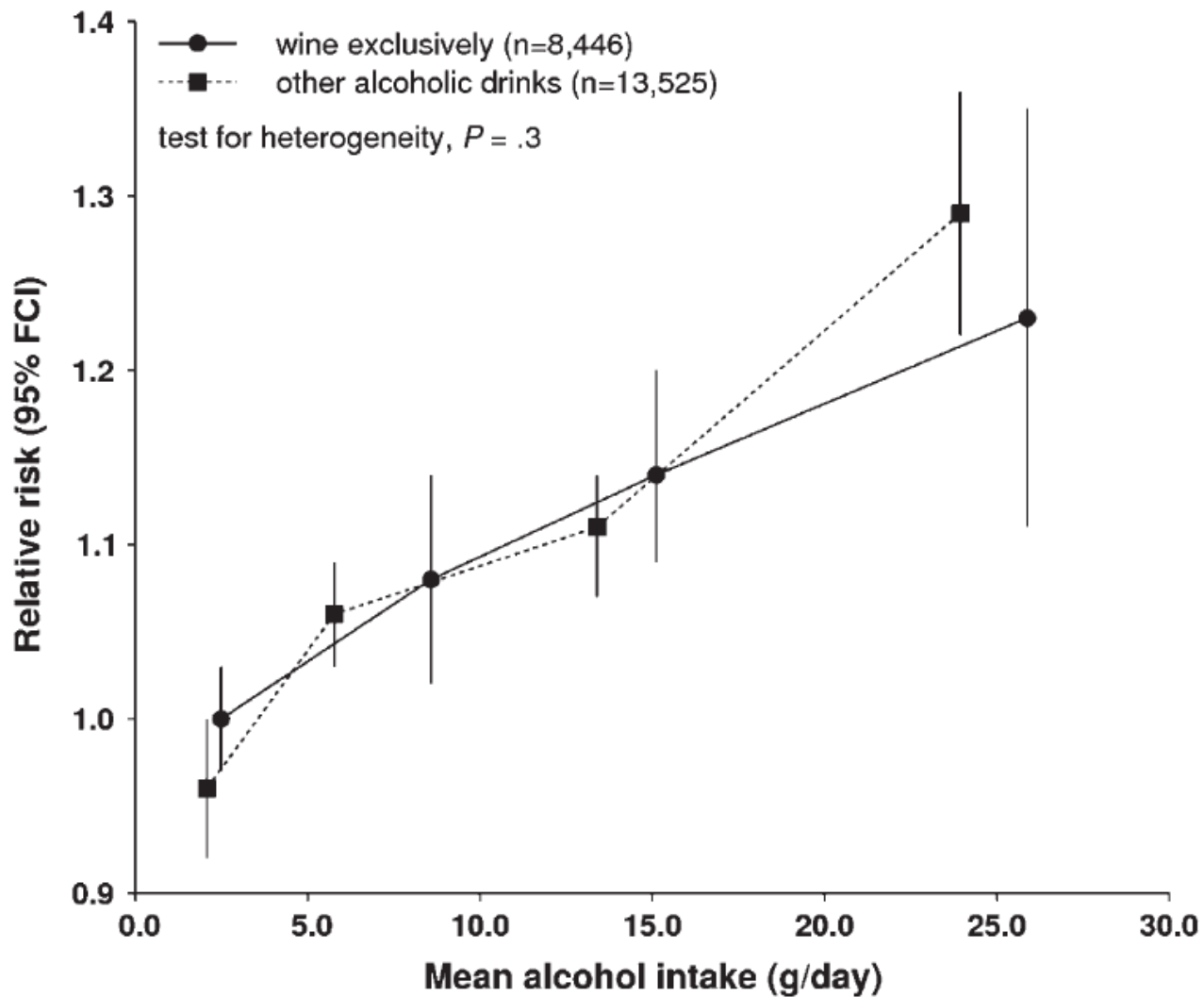
Source: Corrao et al 2009



Decline in risk of oesophageal cancer after drinking cessation

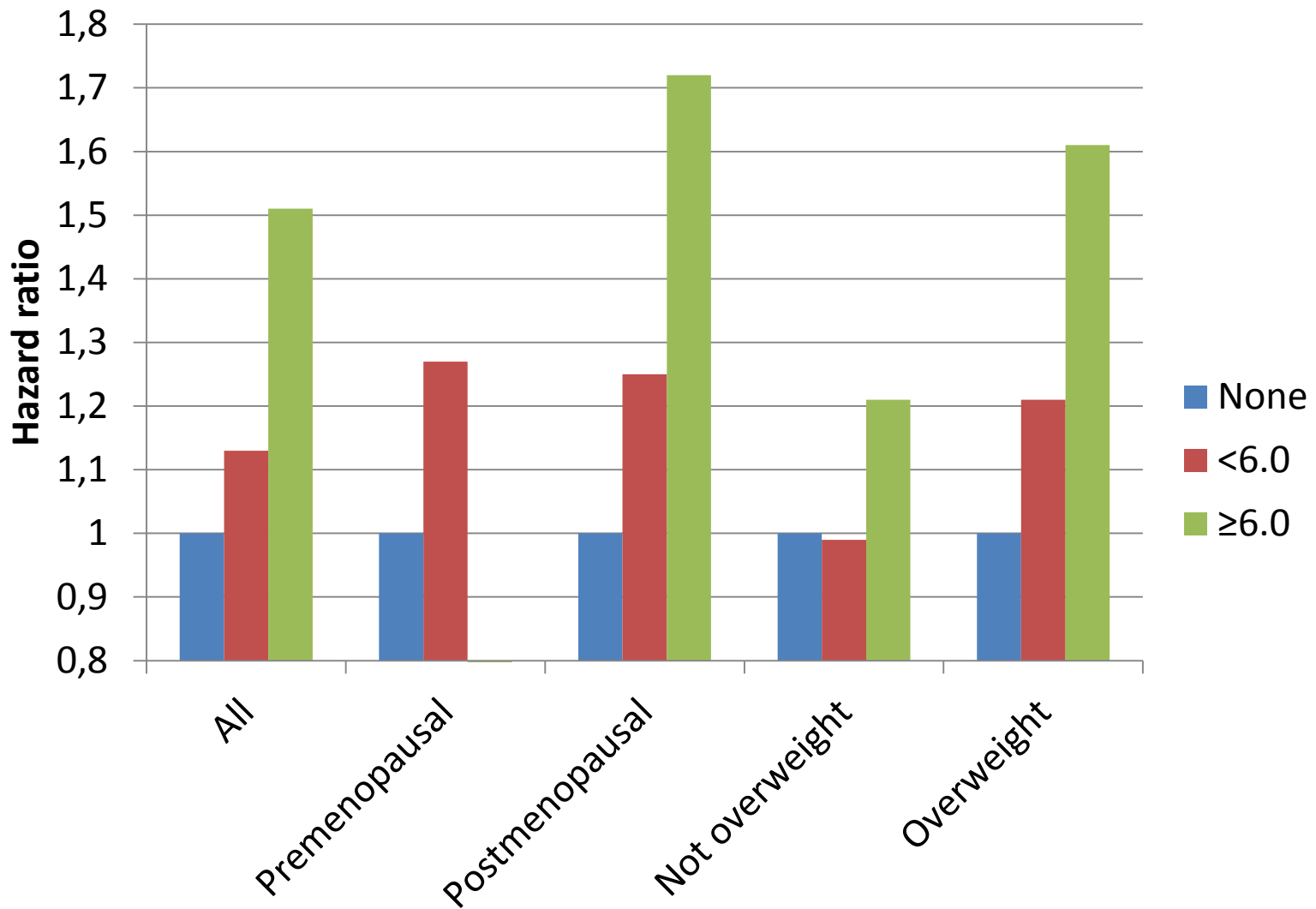
Source: Jarl & Gerdtham 2012





Relative risk of breast cancer by alcohol consumption

Source: Allen et al 2009



Risk of death (HR) from breast cancer recurrence by alcohol consumption (none, <6g/day, ≥6g/day)

Source: Kwan et al 2010

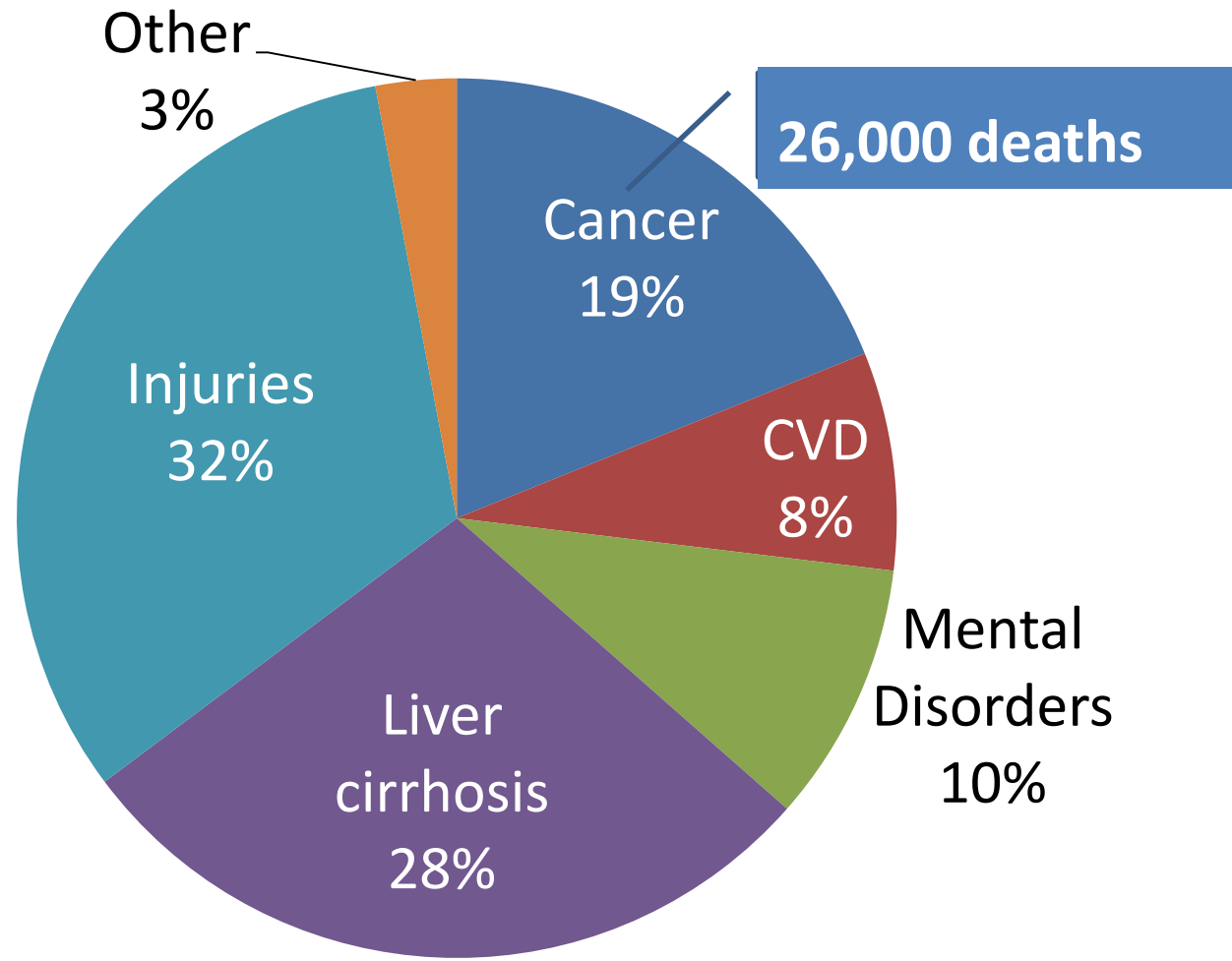
## 6.1 Carcinogenicity in humans

1. There is *sufficient evidence* in humans for the carcinogenicity of alcoholic beverages.
2. The occurrence of malignant tumours of the oral cavity, pharynx, larynx, oesophagus, liver, colorectum and female breast is causally related to the consumption of alcoholic beverages.
3. There is substantial mechanistic evidence in humans who are deficient in aldehyde dehydrogenase that acetaldehyde derived from the metabolism of ethanol in alcoholic beverages contributes to the causation of malignant oesophageal tumours.

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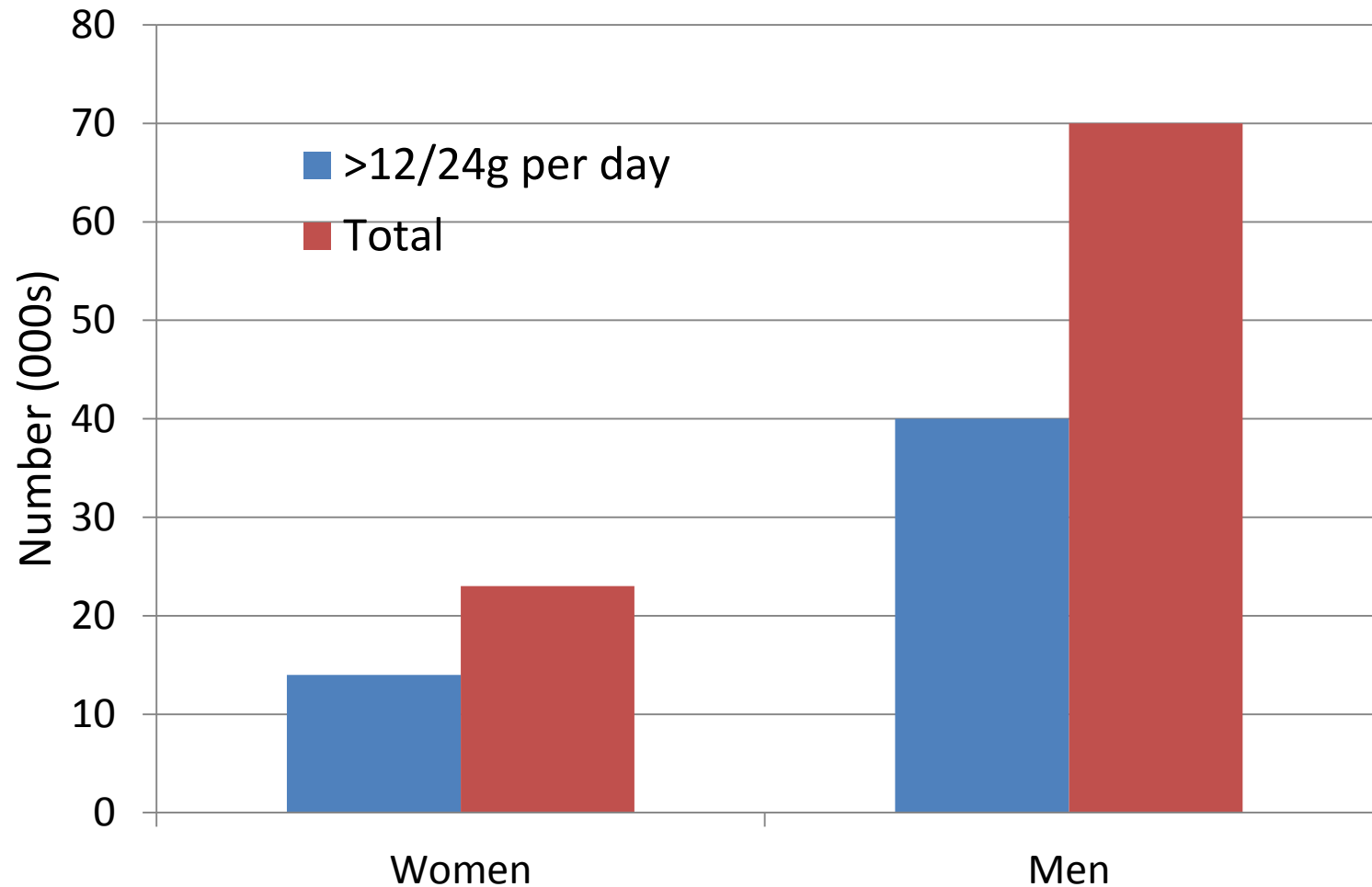
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Alcohol-attributable deaths by disease groups for people aged 15-64 years living in EU in 2004. Total deaths: 138,000



Source: Rehm et al 2012

Amongst people aged 15-64 years living in the EU in 2004, 8% of all male and 6% of all female cancer deaths were due to alcohol.



Number of alcohol-attributable cancers (95% CI) in women and men in France, Italy, Spain, UK, Netherlands, Greece, Germany, Denmark in 2008.

Source: Schutze et al 2011

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- The Margin of Exposure (MOE) compares a toxic threshold of a substance with the exposure of the substance.
- The European Food Safety Authority judges MOEs for carcinogens above 1,000 as low priority for public health when based on human data.
- This means that provided that the dose consumed is 1,000 times less than the toxic threshold, this is acceptable for public health exposure (it does not mean that the consumption is completely safe).

The toxic threshold of alcohol for human cancer is about 50g alcohol (5 drinks a day). [This is based on animal studies in which 10% develop cancer from the equivalent dose].

Using European Food Safety Authority guidelines on exposure to carcinogens in food and drinks, exposure should be no more than one thousandth the toxic dose, which works out at 50mg ethanol a day, about 20g alcohol (2 drinks) a year.

EU adults who drink alcohol on average consume about 30g (3 drinks) a day, 600 times more than the exposure level set by the European Food Safety Authority guidelines.

Based on one tenth the toxic dose, the equivalent exposure for a non-carcinogenic outcome, e.g. liver cirrhosis, should be no more than about 3g (one third of a drink) a day.

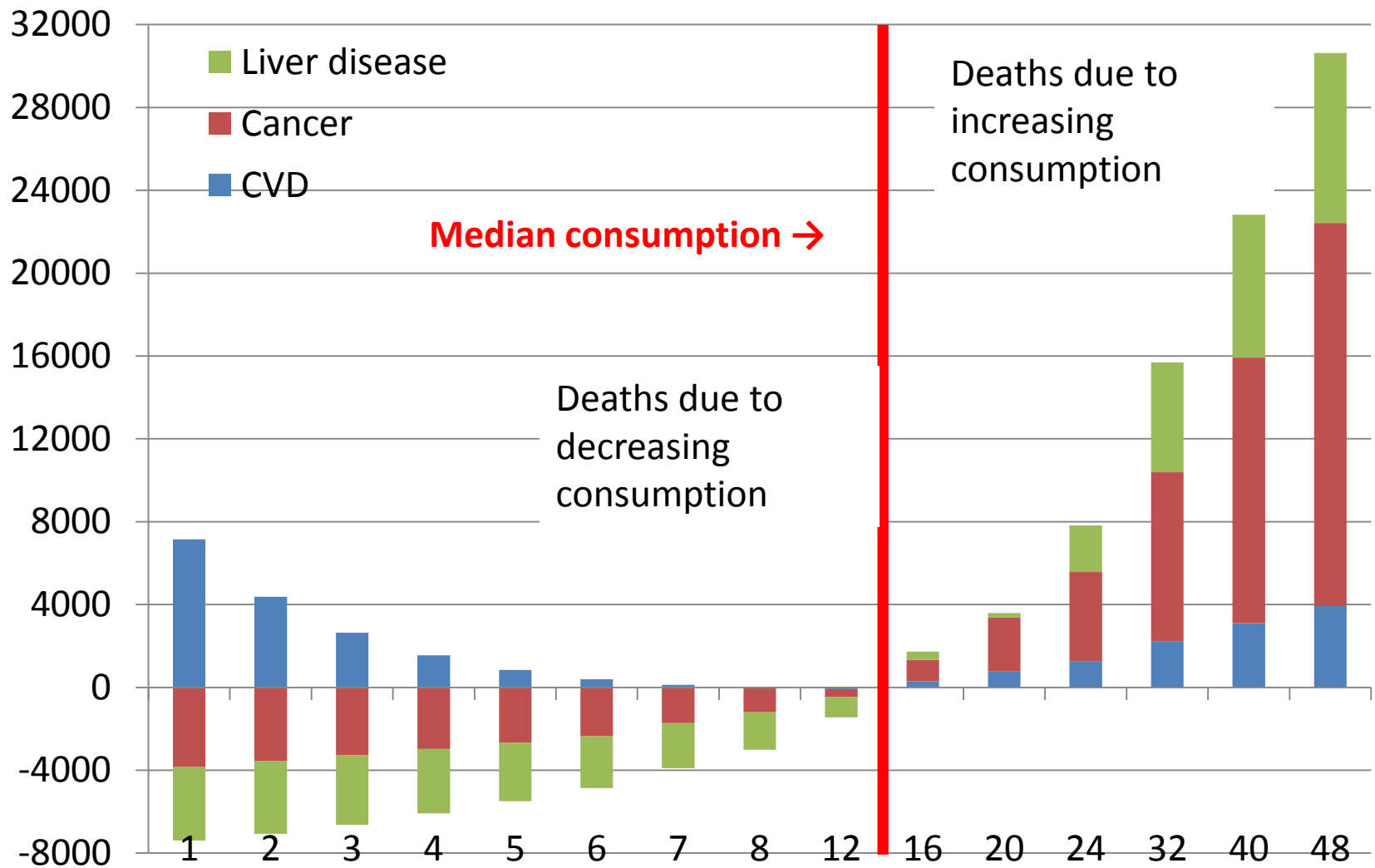
EU adults who drink consume 10 times this amount.

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Alcohol in small regular doses can reduce the risk of ischaemic events, in particular ischaemic heart disease.

This effect can be achieved at doses of 5g a day, is moderated in overweight individuals, and disappears with just one episode of binge drinking (60g, six drinks, on one occasion) a month.



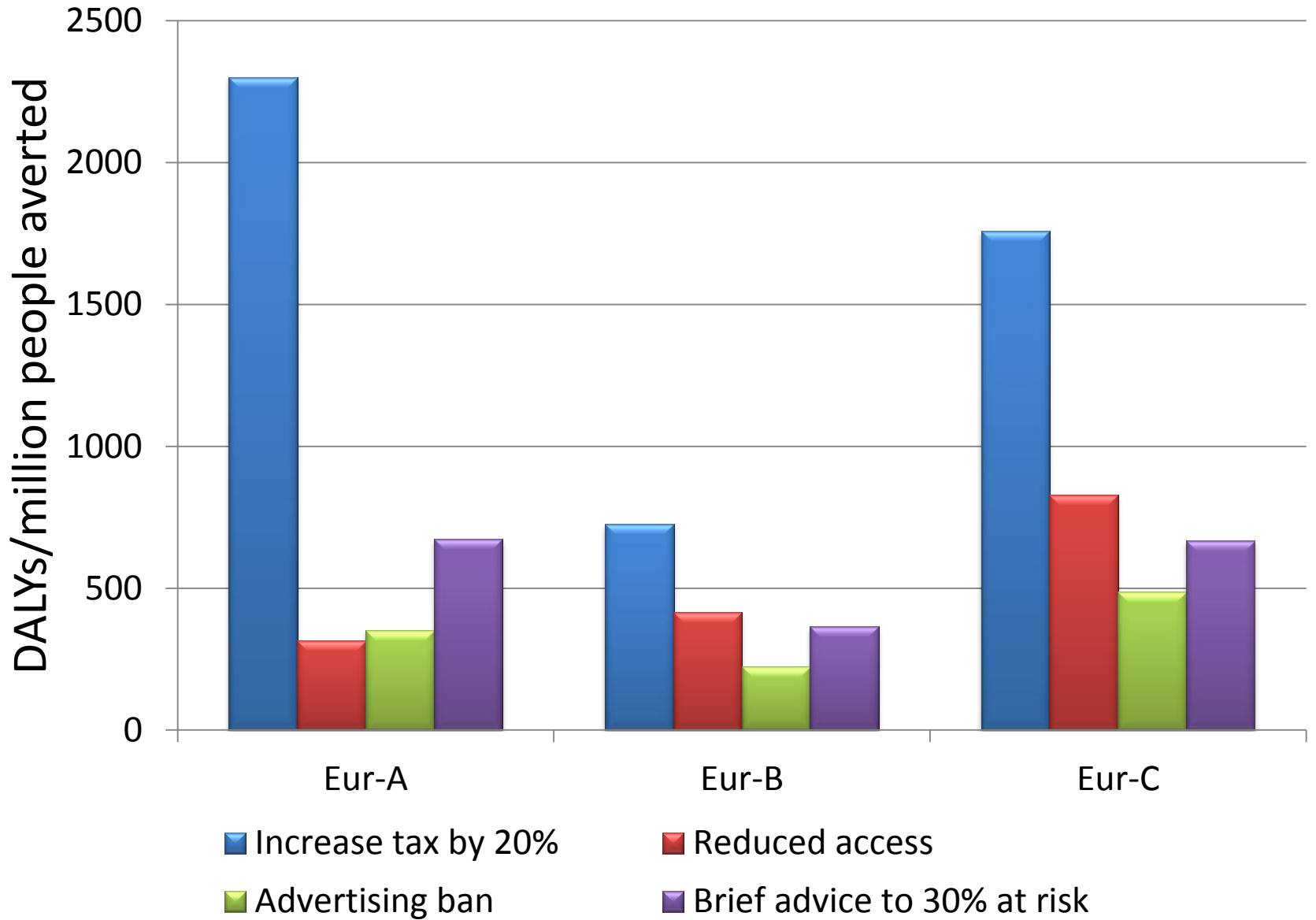
Deaths prevented or caused by daily alcohol consumption for adults living in England in 2006 compared to actual median alcohol consumption of 13g/day.

Source: Nichols et al 2012



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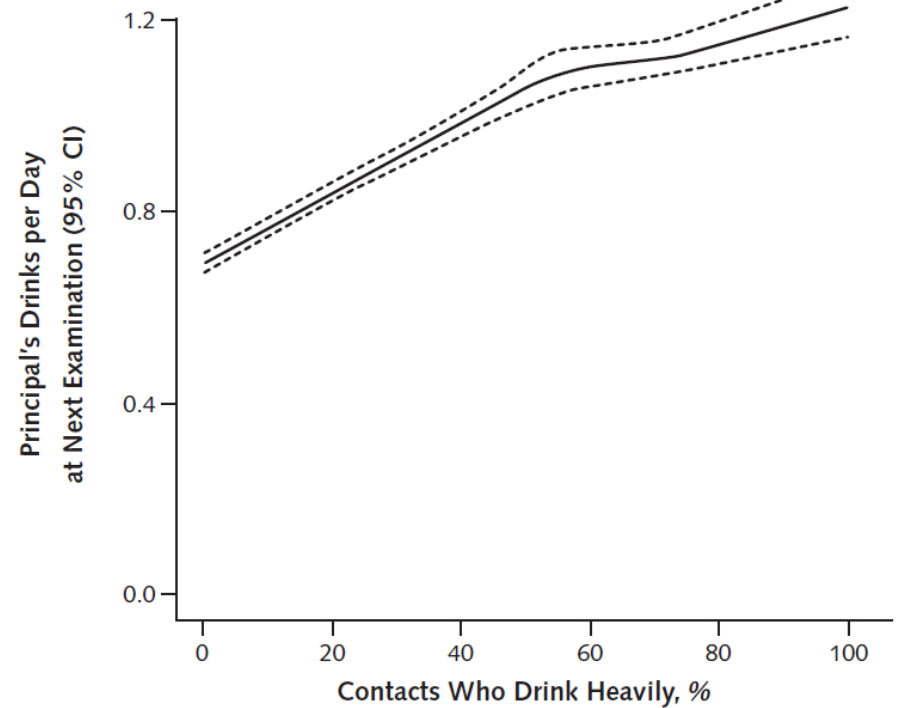
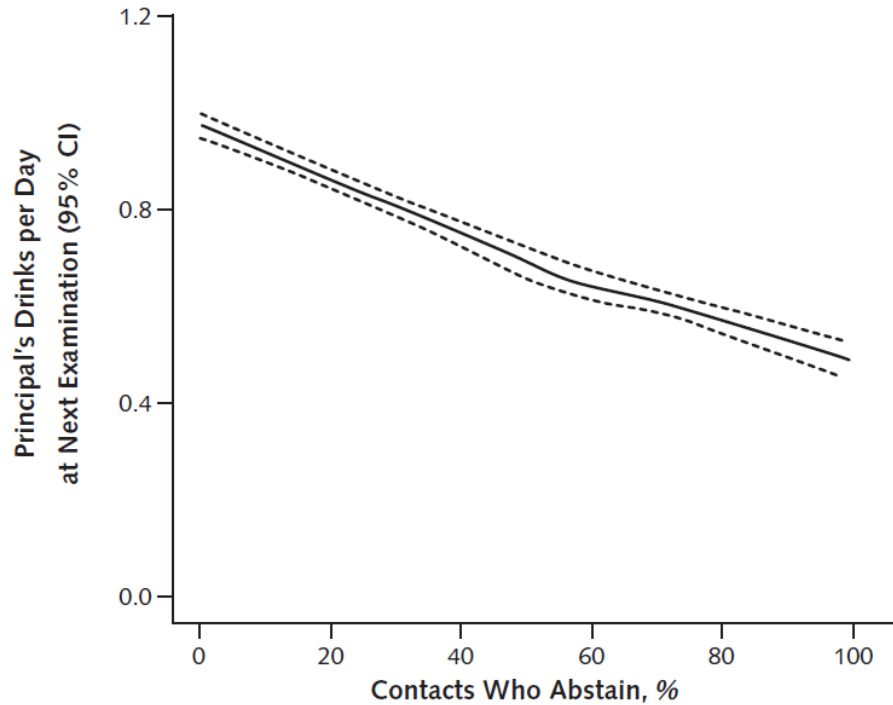
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Source: World Health Organization 2009

In addition, consumers should be informed that alcohol causes cancer through highly visible and simple warning labels on all beverage containers.

And, we should encourage our friends and colleagues to drink less.



Framingham Heart Study: Impact of fraction of friends/family who abstained or drank heavily at one examination on drinks/day at next examination.

## **Conclusions:**

1. Alcohol is a carcinogen, causing cancers of the oral cavity, pharynx, larynx, oesophagus, liver, colorectum and female breast.

2. Adopting the standards of the European Food Safety Authority for genotoxic carcinogens, human exposure should be no more than 50 milligrams of ethanol a day. This is the same as about 20 grams (2 drinks) a year.

3. Alcohol should be strictly regulated with price increases, reduced availability and bans on all forms of commercial communications.



4. Brief advice (and treatment) should be offered to all people with heavy drinking (and alcohol use disorders).

5. All alcohol beverage containers should carry warning labels informing consumers that alcohol causes cancer.

6. We could all encourage each other to drink less.