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Expert report on lifestyle and cancer - findings for alcohol

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The Second Expert Report on Food, Nutrition, Physical Activity, and the Prevention of Cancer, was published 2007 by the American Institute for Cancer Research (1). Science can say: could be, might be, some of us think this, and some think that, however, the Expert Report includes important criteria for grading evidence, inferring causation and quantification of risk of disease.

a) **Criteria for grading evidence in 'convincing', 'probable', 'limited - suggestive', 'limited - no conclusion', and 'substantial effect on risk unlikely'.**

Convincing

These criteria are for evidence strong enough to support a judgement of a convincing causal relationship and robust enough to be highly unlikely to be modified in the foreseeable future as new evidence accumulates. All of the following were generally required:

- Evidence from more than one study type.
- Evidence from at least two independent cohort studies.
- No substantial unexplained heterogeneity within or between study types or in different populations relating to the presence or absence of an association, or direction of effect.
- Good quality studies to exclude with confidence the possibility

that the observed association results from random or systematic error, including confounding, measurement error, and selection bias.

- Presence of a plausible biological gradient ('dose response') in the association.
- Strong and plausible experimental evidence, either from human studies or relevant animal models, those typical human exposures can lead to relevant cancer outcomes.

Probable

These criteria are for evidence strong enough to support a judgement of a probable causal relationship, and all the following were generally required:

- Evidence from at least two independent cohort studies, or at least five case-control studies.
- No substantial unexplained heterogeneity between or within study types in the presence or absence of an association, or direction of effect.
- Good quality studies to exclude with confidence the possibility that the observed association results from random or systematic error, including confounding, measurement error, and selection bias.
- Evidence for biological plausibility.

Limited - suggestive

These criteria are for evidence that is too limited to permit a probable or convincing causal judgement, but where there is evidence suggestive of a direction of effect.

Limited - no conclusion

Evidence is so limited that no firm conclusion can be made.

b) Inferring causation

The Expert Panel endorses the view, that causal relationships between alcohol and cancer can be confidently inferred when epidemiological evidence, and experimental and other biological findings, are consistent, unbiased, strong, graded, coherent, repeated, and plausible. Individually, none of these factors is likely to be sufficient to infer a causal relationship with confidence. With regard to food and nutrition single exposures are unlikely to act alone to cause or prevent cancer. In general, many factors act together as contributory or component causes, forming a complete causal process.

c) Quantification of risk

Quantification of the risk of any disease is an essential basis for public health policy planning. It also guides people in making their own decisions about how they lead their lives. It is not enough to know that the risk of cancer is affected by diet. It is also important to know by how much. On a personal level, how can people

best judge how their current diets and ways of life, and any changes they might want to make, are likely to affect their own risk of cancer? Quantifying risk helps to answer such questions. The strength of a relationship between any risk factor and the occurrence of disease is commonly expressed in terms of relative risk (RR). In cohort studies, this is the ratio of risk of a disease among people with a particular characteristic (say, high consumption of alcohol) to that among people without that characteristic (low or no consumption of alcohol).

Relative risks below 1.0 imply a protective effect: so a relative risk of 0.5 for high compared with low vegetable consumption implies a halving of risk. Relative risks above 1.0 indicate an increased risk. Absolute risk is also important. Small RR values, when consistent, are important when the number of people affected is large. A large RR of a rare type of cancer amounts to only a small absolute risk, which may reasonably be considered not significant by individuals assessing their own choices. By contrast, a small RR may amount to a large number of cases for a common type of cancer. For example, an increased risk of 10 per cent implied by a RR of 1.10 amounts to many extra cases of colorectal and breast cancer in Europe and North America, where these cancers are common. Small relative risks may amount to strong evidence if consistently found in large, well designed studies.

Alcoholic drinks and the risk of cancer

According to the Expert Report the evidence that alcoholic drinks are a cause of cancers of the mouth, pharynx, and larynx,

oesophagus; breast cancer in women and colorectal cancer in men is convincing. Alcoholic drinks are probably a cause of liver cancer, and of colorectal cancer in women. The evidence does not show a clear level of consumption of alcoholic drinks below which there is no increase in risk of the cancers it causes. The evidence shows that all alcoholic drinks have the same effect; data do not suggest any significant difference depending on the type of drink. This recommendation therefore covers all alcoholic drinks, whether beers, wines, spirits, or other alcoholic drinks. The important factor is the amount of ethanol consumed.

The Million Women Study

Between 1996 and 2001 a total of 1.3 million women who attended breast cancer screening clinics in the United Kingdom were systematically surveyed by Naomi E. Allen and co-workers (2). The investigators found that after 7 years of follow-up, even light to moderate levels of alcohol consumption were predictive of an increased risk of cancers of the breast, rectum, liver, oral cavity, pharynx, larynx and oesophagus. Because of inability to differentiate between former drinkers and lifelong never drinkers, all subsequent analyses were restricted to drinkers and women who reported drinking some alcohol, but less than or equal to 2 drinks per week, were taken as the reference group. Non-drinkers had a statistically significant increased risk for several cancer sites (e.g. cancers of the oral cavity, pharynx, oesophagus, stomach and liver) compared with women who drank fewer than or equal to 2 drinks per week.

Taking into account the prevalence of alcohol consumption and its observed relative risks, the authors

estimate the total excess of cancers to be about 15 per 1000 women in developed countries up to age 75 years for every additional drink consumed: 1 per 1000 for cancers of the oral cavity and pharynx, 0.7 per 1000 for oesophageal cancer, 0.7 per 1000 for cancer of the larynx, 1 per 1000 for rectal cancer, 0.7 per 1000 for liver cancer, and 11 per 1000 for breast cancer. For a woman considering personal absolute risk in connection with alcohol consumption, excess cancers of the upper aerodigestive tract (2.4 of the 15 excess cancers) and breast cancer (11 of the 15 excess cancers) are clearly the most important cancer sites of concern.

Smoking and drinking

The association of alcohol intake with an increased risk of upper aerodigestive tract cancers (cancers of oral cavity, pharynx, larynx and oesophagus) illustrates the potential influence of lifestyle factors in addition to alcohol consumption. Increasing alcohol intake was not associated with an increased risk of cancers of the upper aerodigestive tract in never smokers or past smokers, but was strongly associated with an increased risk among current smokers.

In the absence of tobacco smoking there seems to be little or no effect of moderate alcohol consumption on the risk of cancers of the upper aerodigestive tract. The most widely accepted mechanism through which alcohol might increase risk of cancers of the upper aerodigestive tract is that alcohol may act as a solvent for carcinogens contained in tobacco smoke.

Women who drank wine exclusively also tended to be more affluent, to be leaner, or to take strenuous exercise more frequently and were less likely