

Boston University School of Medicine
Institute on Lifestyle & Health

Critique 179: Response to proposed guidelines regarding alcohol consumption in “Guidelines for a Healthy Diet” from the the Health Council of the Netherlands – 26 January 2016

The Health Council of the Netherlands has published “Guidelines for a Healthy Diet” that include a section related to alcohol consumption. Our Forum has been asked by academic groups in the Netherlands to provide comments on the alcohol guidelines. An English translation of sections of the document that was provided to the Forum is attached as an Appendix.

Forum Comments

While the discussion included in the sections of the Guidelines provided sometimes present a reasonable review of the effects of alcohol consumption on health, there were some statements not consistent with current scientific data. There have been hundreds of excellent scientific studies on these topics, and the Forum cannot determine which papers were used to get the associations shown. For example, most cohort epidemiologic studies have shown that moderate drinkers of all alcoholic beverages have a lower risk of diabetes, and several RCTs have supported such findings. Yet, the Guidelines states that “. . . moderate consumption of beer in men, and spirits in women, is associated with a higher risk of diabetes.” There was concern by Forum members that some of the figures presented in the Guidelines showed only the effects of high levels of alcohol, but not the effects of moderate intake, making it impossible to demonstrate a “J-shaped” curve (which is the usual finding for most outcomes). Forum members emphasized that if data indicate a J-shaped curve between alcohol and disease outcomes, this should be clear in figures presented to the public.

Forum member Ellison was asked to respond to 3 questions that had been raised regarding the proposed new guidelines:

Question 1: Do you consider it reasonable based on the current scientific literature to state one should not consume alcohol?

Forum member Ellison replied: “Except for people with specific contraindications to alcohol (e.g., former abusers, children, pregnant women, those with a few types of liver or other diseases for whom any alcohol should be avoided), every patient and member of the public should be given scientifically sound and balanced information about alcohol consumption. Our understanding based on current scientific data is that middle-aged and older adults should be told that the risks of a number of the key diseases of ageing and causes of death (coronary heart disease, ischemic stroke, dementia, and diabetes) are reduced for light-to-moderate drinkers in comparison with abstainers. This information should be taken into consideration (preferably in discussions with their health care professionals) when deciding whether or not they would like to drink moderately. As with anything else, excessive drinking should be avoided. (Incidentally, data are very limited, but I am not aware of any evidence that non-drinkers who decide with their doctor to start having a drink a day with dinner progress to abusive drinking.)” Forum member Finkel commented: “I believe that adults of sound mind deserve the freedom to learn everything. How they then behave, for example whether or not they choose to drink, will depend on their conscience, judgment, needs and desires (and, I suppose, the law) as influenced by whichever advisers they appoint.”

Question 2: Do you feel that scientific evidence on the relation between alcohol and health has changed to such an extent since 2006 (since the previous Dutch guidelines) that the current revision of the guideline is needed?

Ellison stated: “While I am not cognizant of previous Dutch guidelines, there have been a very large number of excellent epidemiologic cohort studies and now a number of

human trials, as well as a huge number of animal experiments, that have confirmed the health aspects of moderate drinking. There are still some who appear to be very 'anti-alcohol' (perhaps on 'moral' grounds) and who continually try to exaggerate the harmful effects of alcohol and alarm the public; an example is the recent focus on alcohol and cancer. Except for breast cancer, there is little evidence that light-to-moderate alcohol intake appreciably increases the risk of cancer, especially when under-reporting and pattern of drinking are taken into account.

"For example, in the National Health Interview Survey of more than 300,000 subjects with 8,362 cancer deaths, in comparison with lifetime abstainers, the RR for all-site cancer death was 0.87 for light drinkers (up to 3 drinks/week) and 0.96 for moderate drinkers (>3 – 7 drinks/week for women and >3 – 14 drinks/week for men); only heavier drinkers had an increased RR of 1.27 (Breslow et al). Further, a report from the large and important EPIC study by Bergman et al demonstrated a "J-shaped" curve for almost all types of cancer deaths and total mortality, with the reduced risk up to about 1 drink/day for women and just over 2 drinks/day for men. Thus, heavy drinking is indeed a factor for many cancers, but moderate drinking is not.

"For breast cancer, the incidence has repeatedly been shown to be slightly increased among women reporting only 1 drink/day. In many studies, this risk is attenuated by absence of binge drinking, by adequate folate intake, and by avoiding hormone replacement therapy. Also, as shown by Klatsky et al in their very large Kaiser-Permanente Study, so-called "moderate" drinkers who had other evidence in their extensive study records that indicated greater alcohol use or abuse on other occasions, showed an increase in the risk of cancer death; they were classified as "under-reporters" of alcohol intake in that study. However, when an exhaustive search of other records revealed no data suggesting higher alcohol intake or alcohol misuse, subjects were classified as "not under-reporters"; these subjects did not show an increase in risk of mortality or cancer in comparison with non-drinkers. (This paper was reviewed by the International Scientific Forum on Alcohol Research: available at www.bu.edu/alcohol-forum/critique-138)."

Forum member de Gaetano commented that "We should point out that among young women, breast cancer risk is higher than the risk for cardiovascular disease (CVD); thus, even a small increase of cancer risk by moderate alcohol should be taken into careful consideration, in view of the concomitant negligible reduction of CVD risk. In contrast, in women after menopause, the small increase in the risk of breast cancer associated with moderate drinking is counteracted by a much greater decrease in risk of cardiovascular disease: moderate alcohol would decrease the risk of more common cardiovascular disease by about 20%, but would only slightly increase breast cancer risk. The net effect for a post-menopausal woman would thus be a lower mortality risk. Each woman, with her doctor, might then decide whether or not to drink." Reviewer De Gaetano also added: "The positive relations shown for alcohol and lung cancer alluded to in this paper may well be related to residual confounding from tobacco use; most epidemiologic studies show little relation (neither positive nor negative) between alcohol and lung cancer."

Reviewer Stockley commented: "Overall, evidence since 2006 has strongly supported the contention that, with few exceptions, adults who would like to consume some alcohol should be informed that light-to-moderate alcohol intake among older people should be considered as a component of a 'healthy lifestyle.' This message is not

presented in the new Guidelines.”

Question 3: Is it scientifically justified to formulate a beverage – beer, wine, spirits – specific advice on the following outcomes: mortality, diabetes, colorectal cancer and lung cancer? Or is it only possible to advise on alcohol effects in general?

Forum member Ellison replied: “Much data support additional health benefits from the polyphenols present in wine, and to some extent in beer, but not in spirits. However, the pattern of drinking (regular consumption of small amounts, especially with food, and avoiding binge drinking) may explain a part of this additional protection. Most people may prefer one type of beverage but often consume other types as well. Thus, in my opinion, it is probably reasonable to just give general guidelines, saying that ‘When limited to 1 drink/day for women or 2 drinks/day for men, with no binge drinking, and especially when consumed with meals, there are potential health benefits and few risks of such drinking.’

“It is important that any guidelines should also emphasize that the health benefits of alcohol apply primarily to middle-aged and older men and women. Binge drinking among young people is a social issue; such drinking has no health benefits and many adverse effects on the individual and on society.”

Further comments on alcohol and cancer: Reviewer Stockley had several comments to make regarding alcohol and cancer: “It is known that the cumulative effect of other lifestyle choices associated with drinking contributes to the occurrence of cancer. Of all lifestyle factors related to cancer, the attributable risk for tobacco was 20.1%, body mass 3.9%, physical inactivity 5.6%, and alcohol 3.1% (Begg et al 2007, Begg et al 2008)” Reviewer Ellison noted that Shin et al recently showed that BMI modifies the risk of breast cancer associated with alcohol.

Forum member Stockley continued: “The overall relationship between alcohol consumption and cancer is complex, and there may be threshold effects in the relationship between alcohol consumption and the risk of cancer. In a study of cancers of the upper aero-digestive tract, liver and colorectum, the risk only increased when more than 25 g alcohol/day was consumed (Bagnardi et al). It has also been suggested that the risk of developing a cancer of the aero-digestive tract is less when alcohol is consumed with food (Dal Maso et al).

“A comprehensive review of more than 7,000 peer-reviewed papers on the association of lifestyle factors and cancer undertaken by the World Cancer Research Fund, in cooperation with the American Institute for Cancer Research (2007), reports that an increased risk for colorectal cancer is only apparent above a threshold of 30 g alcohol/day for both men and women.

“Recent case-control analyses by Anantharaman et al and Szymańska et al of alcohol and the risk of cancers of the upper aero-digestive tract (UADT) also suggest that tobacco use is the most important factor in the risk of these cancers, and that the risk is enhanced among those who also consume two or more alcoholic drinks per day. Alcohol consumption alone among non-smokers had little effect on the risk, except for oesophageal cancer. Anantharaman et al demonstrated that tobacco and alcohol use together accounted for 73% of total UADT cancer burden in the European Union, of which tobacco use alone accounted for 28.7%, alcohol use alone accounted for only 0.4%, but the combination of smoking and drinking accounted for 43.9%, of the population attributable risk.” Similar results were reported by Hashibe et al: “The PAR (population attributable risk) for UADT from tobacco or alcohol was 72% (95% CI 61-

79%) for head and neck cancer, of which 4% was due to alcohol alone, 33% was due to tobacco alone, and 35% was due to tobacco and alcohol combined.”

Added Forum member Stockley: “Concerning the relationship between alcohol and breast cancer, it has been suggested that consumption patterns may modify risk (Morch et al), such that the consumption of four to five drinks consumed per session may increase/double risk by 50% compared to only one drink consumed per session. Paradoxically, alcohol dependence does not increase the risk of breast cancer (Kuper et al). The concurrent consumption of alcohol and folate (at least 300 mg/day of folate) has been observed to reduce the relative risk of alcohol-induced breast cancer from 1.24 to 1.05 for women consuming greater than 15 g alcohol/day (equivalent to approximately 1 to 2 standard drinks in different countries), and was reduced to 0.55 for women consuming greater than 600 mg/day of folate. Indeed, in the study by Zhang et al, the concurrent consumption of folate-containing vitamin supplements reduces the relative risk to 0.74 for women consuming greater than 15 g alcohol/day compared to those not using vitamins.

“Boffetta and Hashibe, in a review of alcohol and cancer, stated that drinking, especially heavy drinking, increases cancer risk. They concluded, however, that ‘Total avoidance of alcohol, although optimum for cancer control, cannot be recommended in terms of a broad perspective of public health, in particular in countries with high incidence of cardiovascular disease.’”

Reviewer Van Velden stated: “Scientists tend to ignore the role genetic make-up has to play in cancer; for example, people with the ApoE-4 polymorphism are more at risk for adverse effects of ethanol. Nutrigenetics also has a role to play in estrogen-positive patients. One size does not fit all. We cannot make blanket recommendations for everybody in a genetic-diverse population.” Reviewer Keil tended to disagree: “In my opinion chronic diseases develop from an interaction between host and environment. There may be nothing special concerning an interaction between alcohol and genetic make-up. Heavy smokers have a life-long lung cancer risk of ‘only’ 10-15 %, although the RR of lung cancer in heavy smokers versus non-smokers is above 25. This is also a nice example of poor prediction of a risk factor in spite of a huge RR: in other words, 85-90% of smokers do not develop lung cancer (but admittedly have many other adverse health effects).”

General comments on the proposed guidelines: The authors of these proposed guidelines tend to down-play the role of moderate drinking in preventing CVD, the leading cause of death throughout the developed world. They seem to have ignored statements from many scientists, including Roerecke and Rehm, who stated: “For drinkers having one to two drinks per drinking day without episodic heavy drinking, there is substantial and consistent evidence from epidemiological and short-term experimental studies for a beneficial association with IHD risk when compared to lifetime abstainers. The alcohol-IHD relationship fulfills all criteria for a causal association proposed by Hill.”

Forum member Keil noted: “The more scientific evidence supporting a protective effect of moderate alcohol drinking on a number of chronic diseases and longevity has been produced in recent years, it appears that the more restrictive the drinking guidelines of countries like the UK or The Netherlands become. (In a country like Germany it is very difficult for a man/woman who consumes alcohol moderately and regularly to stay below 15 grams/day, because the regular bottle of beer is about 0.5 liter, which adds up to 20

grams of alcohol.) Further, the author's comments relating alcohol to lung cancer is really not supported by sound data, but I noted positively that the Dutch guidelines mention alcohol drinking to be protective against dementia. This fact is often not mentioned in guidelines."

Forum member Skovenborg stated: "I agree with other members that there are serious problems with these guidelines. However, while folate may well help attenuate the effects of alcohol on breast cancer, we acknowledge that some studies do not support this (Jung et al)."

Reviewer Keil commented: "Most experts agree today that a Mediterranean diet is the best choice for a healthy diet (and for the joy of eating). A Mediterranean diet however is hardly conceivable without a glass of wine. Trichopoulou et al showed in their paper on the components of the Mediterranean diet that about 25% of the benefit of the Mediterranean diet is accounted for by alcohol (wine)."

Reviewer Mattivi noted: "I often wonder why not much attention is paid to the association with meals, which I consider an essential piece of information. Several excellent studies have shown that consuming wine with meals decreases oxidative stress (Ursini et al, Sies et al). A more recent paper by Augustin et al supports these findings. I am personally convinced that this piece of knowledge should enter the guidelines since "*when*" is the second question after "*how much*" a consumer would like to know."

Forum member Barrett-Connor commented: "I am still trying to determine what explanations there could be for the differences in these proposed guidelines for the Dutch from those for most other countries. I believe the Dutch are the tallest people in Europe: could this mean that they consume more alcohol for a given level of BMI? Also, their diet is different, with many dairy products. Finally, bicycling, so common in the Netherlands, is a mode of transportation that could be an excellent source of exercise. These factors could possibly lead to different guidelines." Reviewer Ellison added: "I think that a very restricted review of current scientific data and/or, perhaps, an inherent bias against alcohol consumption in general may be better explanations for the current proposed guidelines."

References from Forum Critique

- Anantharaman D, Marron M, Lagiou P, Samoli E, Ahrens W, Pohlman H, et al. Population attributable risk of tobacco and alcohol for upper aerodigestive tract cancer. *Oral Oncol* 2011;47:725-731. doi:10.1016/j.oraloncology.2011.05.004.
- Augustin LSA, Gallus S, Tavani A, Bosetti C, Negri E, La Vecchia C. Alcohol Consumption and Acute Myocardial Infarction: A Benefit of Alcohol Consumed With Meals? *Epidemiology* 2004;15:767-769.
- Bagnardi V, Rota M, Botteri E, et al. Alcohol consumption and site-specific cancer risk: a comprehensive dose-response meta-analysis. *British Journal of Cancer* 2015;112:580-593. doi: 10.1038/bjc.2014.579
- Begg S, Vos T, Barker B, Stevenson C, Stanley L, Lopez A (2007). The burden of disease and injury in Australia 2003. Cat. No. PHE 82. Canberra: AIHW; 2007.
- Begg S, Vos T, Barker B, Stanley L, Lopez AD (2008). Burden of disease and injury in Australia in the new millennium: measuring health loss from diseases, injuries and risk factors. *Med J Aust* 2008;188:36-40.
- Bergmann MM, Rehm J, Klipstein-Grobusch K, et al (38 authors). The association of pattern of lifetime alcohol use and cause of death in the European Prospective

Investigation into Cancer and Nutrition (EPIC) study. *Int J Epidemiol* 2013;42:1772-1790.

Boffetta P, Hashibe M. Alcohol and cancer. *Lancet Oncology* 2006;7:149-156
Breslow RA, Chen CM, Graubard BI, Mukamal KJ. Prospective study of alcohol consumption quantity and frequency and cancer-specific mortality in the US population. *Am J Epidemiol* 2011;174:1044-1053. doi:10.1093/aje/kwr210.

Doll R. The benefit of alcohol in moderation. *Drug Alcohol Rev* 1998;17:353-363
Hashibe M, Brennan P, Chuang S-C I, et al. Interaction between Tobacco and Alcohol Use and the Risk of Head and Neck Cancer: Pooled Analysis in the International Head and Neck Cancer Epidemiology Consortium. *Cancer Epidemiol Biomarkers Prev* 2009;18:541-550.

Jung S, Wang M, Anderson K, Baglietto L, Bergkvist L, Bernstein L, et al. Alcohol consumption and breast cancer risk by estrogen receptor status: in a pooled analysis of 20 studies. *Int J Epidemiol* 2015;28. pii: dyv156. [Epub ahead of print]
Klatsky AL, Udaltsova N, Li Y, Baer D, Tran HN, Friedman GD. Moderate alcohol intake and cancer: the role of underreporting. *Cancer Causes Control* 2014;25:693-699; DOI 10.1007/s10552-014-0372-8 2014

Kuper H, Ye W, Weiderpass E, Ekblom A, Trichopoulos D, Nyrén O, Adami HO. Alcohol and breast cancer risk: the alcoholism paradox. *Br J Cancer* 2000;83:949-951.
Mørch LS, Johansen D, Thygesen LC, Tjønneland A, Løkkegaard E, Stahlberg C, Grønbaek M. (2007) Alcohol drinking, consumption patterns and breast cancer among Danish nurses: a cohort study. *Eur J Public Health* 2007;17:624-629.

Roerecke M, Rehm J. Alcohol consumption, drinking patterns, and ischemic heart disease: a narrative review of meta-analyses and a systematic review and meta-analysis of the impact of heavy drinking occasions on risk for moderate drinkers. *BMC Medicine* 2014;12:182

Shin A, Sandin S, Lof M, Margolis KL, Kim K, Couto E, Adami HO, Weiderpass E. Alcohol consumption, body mass index and breast cancer risk by hormone receptor status: Women' Lifestyle and Health Study. *BMC Cancer* 2015;15:881 (DOI 10.1186/s12885-015-1896-3)

Sies H, Stahl W, Sevanian A. Nutritional, dietary and postprandial oxidative stress. *J Nutr* 2005;135:969-972.

Szymanska K, Hung RJ, Wunsch-Filho V, et al. Alcohol and tobacco, and the risk of cancers of the upper aerodigestive tract in Latin America: a case-control study. *Cancer Causes Control* 2011;22:1037-1046.

Trichopoulou A, Bamia C, Trichopoulos D. Anatomy of health effects of Mediterranean diet: Greek EPIC prospective cohort study. *BMJ* 2009;338:b2337. doi: <http://dx.doi.org/10.1136/bmj>.

Ursini F, Zamburlini A, Cazzolato G, Maiorino, Bon GB, Sevanian A. Postprandial plasma lipid hydroperoxides: A possible link between diet and atherosclerosis. *Free Radical Biology & Medicine* 1998;25:250-252.

World Cancer Research Fund in cooperation with the American Institute for Cancer Research. WCRF/AICR. Expert Report, Food, Nutrition, Physical Activity and the Prevention of Cancer: a Global Perspective. http://www.who.int/substance_abuse/publications/global_alcohol_report/msbgsrupro!les.pdf (2007).

Zhang S, Hunter DJ, Hankinson SE, Giovannucci EL, Rosner BA, Colditz GA, Speizer

FE, Willett WC. A prospective study of folate intake and the risk of breast cancer. JAMA 1999;281:1632-1637.

Forum Summary

The Health Council of the Netherlands has published “Guidelines for a Healthy Diet” that include a section related to alcohol consumption. Our Forum has been asked to provide comments on the alcohol guidelines (an English translation of certain sections related to alcohol consumption are attached as an appendix to the full review of these guidelines). The closing guidelines given in the Dutch document are as follows: “Do not drink alcohol, or at least no more than one glass per day. [The guidelines from 2006 recommended limiting one’s alcohol intake to one glass (women) or two glasses (men). The current data suggests that the guideline for men should be adjusted downwards.]”

Forum members were concerned that the guidelines were based on a very restricted number of the many hundreds of excellent epidemiologic and experimental publications in recent years that clearly indicate that moderate alcohol has favorable effects on most of the diseases of ageing, and on total mortality risk. For example, the proposed guidelines focus on adverse effects of alcohol on lung cancer, while current scientific knowledge suggests that it has negligible effect. Much of the discussion in the guidelines focusses on the dangers of alcohol on cancer, whereas data show that almost all of the risk (except for breast cancer) is from heavy drinking, not light-to-moderate drinking. Data strongly support a major role of alcohol *abuse* for upper aero-digestive cancers, but only minor effect on cancer in general from light-to-moderate drinking, especially when other lifestyle factors and under-reporting of intake are taken into account.

The findings for a benefit of moderate drinking on cardiovascular disease among middle-aged and older adults are very much under-played, despite overwhelming data showing a significant benefit. The “J-shaped” curve (lower risk of many diseases with light-to-moderate alcohol intake with higher risk for heavier drinking) is not presented in the guidelines, a major omission when presenting data on alcohol to the public. The additional protection against disease when moderate alcohol consumption occurs with meals was not mentioned. As one Forum member commented: “When professionals discuss alcohol consumption, what consumers want to know is first ‘how much,’ and then ‘when’ to drink.”

Overall Forum members considered that the proposed guidelines regarding alcohol consumption from the Health Council of the Netherlands in a number of sections do not reflect current scientific knowledge on the association of alcohol to health and disease. Forum members tend to agree with the statement of Boffetta and Hashibe who, in an extensive review of alcohol and cancer, stated that “Drinking, especially heavy drinking, increases cancer risk. However, total avoidance of alcohol, although optimum for cancer control, cannot be recommended in terms of a broad perspective of public health, in particular in countries with high incidence of cardiovascular disease.” Forum members consider that it is important to describe both the potential harms and benefits for health associated with alcohol consumption, especially for middle-aged and older adults. The “J-shaped” curve should be an important concept in any guidelines on drinking that are presented to the public.

* * * * *

Comments on this critique by the International Scientific Forum on Alcohol Research were provided by the following members:

Andrew L. Waterhouse, PhD, Department of Viticulture and Enology, University of California, Davis, USA

David Van Velden, MD, Dept. of Pathology, Stellenbosch University, Stellenbosch, South Africa

Fulvio Ursini, MD, Dept. of Biological Chemistry, University of Padova, Padova, Italy

Dag S. Thelle, MD, PhD, Senior Professor of Cardiovascular Epidemiology and Prevention, University of Gothenburg, Sweden; Senior Professor of Quantitative Medicine at the University of Oslo, Norway

Pierre-Louis Teissedre, PhD, Faculty of Oenology–ISVV, University Victor Segalen Bordeaux 2, Bordeaux, France

Arne Svilaas, MD, PhD, general practice and lipidology, Oslo University Hospital, Oslo, Norway

Creina Stockley, PhD, MSc Clinical Pharmacology, MBA; Health and Regulatory Information Manager, Australian Wine Research Institute, Glen Osmond, South Australia, Australia

Erik Skovenborg, MD, specialized in family medicine, member of the Scandinavian Medical Alcohol Board, Aarhus, Denmark

Fulvio Mattivi, MSc, Head of the Department of Food Quality and Nutrition, Research and Innovation Centre, Fondazione Edmund Mach, in San Michele all'Adige, Italy

Dominique Lanzmann-Petithory, MD, PhD, Nutrition/Cardiology, Praticien Hospitalier Hôpital Emile Roux, Paris, France

Ulrich Keil, MD, PhD, Professor Emeritus, Institute of Epidemiology & Social Medicine, University of Muenster, Germany

Giovanni de Gaetano, MD, PhD, Department of Epidemiology and Prevention, IRCCS Istituto Neurologico Mediterraneo NEUROMED, Pozzilli, Italy

Harvey Finkel, MD, Hematology/Oncology, Boston University Medical Center, Boston, MA, USA

R. Curtis Ellison, MD, Professor of Medicine & Public Health, Boston University School of Medicine, Boston, MA, USA

Elizabeth Barrett-Connor, MD, Distinguished Professor, Division of Epidemiology, Department of Family Medicine and Public Health and Department of Medicine, University of California, San Diego, La Jolla, CA USA

Appendix

An English translation from parts of Section 8 of the Guidelines for a Healthy Diet, from the Health Council of the Netherlands

Alcoholic beverages

In this chapter, the Committee (Commissie Richtlijnen goede voeding 2015 / Committee on Guidelines for a Healthy Diet 2015) will establish guidelines on alcoholic beverages. First, the conclusions from the background documents will be described, which are relevant for the derivation of the guidelines. The committee will then formulate guidelines, with accompanying explanatory notes.

8.1 Introduction

By definition, a standard glass of an alcoholic beverage contains around 10 grams of

alcohol in the Netherlands. This amount of alcohol is contained in approximately 250 millilitres of beer (5% alcohol), 100 millilitres of wine (12% alcohol) and 35 millilitres of spirits (35% alcohol).^{43,44}

8.2 Findings

The Committee summarised findings from RTSs (Randomised Controlled Trials) and cohort studies that are relevant to the derivation of the guidelines in three tables, which treat the following topics, successively: findings relevant to high alcohol consumption (more than 15 grams per day), findings relevant to moderate alcohol consumption (up to 15 grams per day) and findings relating to death, regardless of cause of death. The committee has chosen to disregard findings relating to very high alcohol consumption. The Committee concluded that it is convincingly demonstrated that high alcohol consumption increases the risk of stroke and binge drinking (60 grams or more per occasion) increases the risk of coronary heart disease. This is because RCTs show that reducing high alcohol intake lowers blood pressure, cohort studies show that a high consumption of alcohol is associated with a higher risk of stroke, and binge drinking increases the risk of coronary heart disease. In addition, high alcohol consumption is associated with a higher risk of breast cancer and colon cancer and high consumption of beer and spirits is associated with lung cancer.

It is likely that moderate alcohol consumption (up to 15 grams per day) is associated with a lower risk of cardiovascular disease, diabetes and dementia, but that breast cancer risk is already elevated in moderate use. However, moderate consumption of beer in men, and spirits in women, is associated with a higher risk of diabetes.

Furthermore, a moderate consumption of beer and wine is associated with a lower risk of lung cancer.

The above findings indicate that moderate alcohol consumption is both favourably and adversely associated with the risk of chronic disease, while higher consumption levels are associated with higher risks of chronic diseases. Table 14 shows that both moderate and high consumption of beer is associated with a higher mortality rate regardless of cause of death. The same applies to high wine consumption. Low consumption of wine is associated with a lower mortality rate. Drinking a glass of an alcoholic beverage every two days is related to a 15 per cent lower risk of death. Moderate alcohol consumption is both positively and negatively correlated with health risks. The positive correlation relates to a lower risk of heart and vascular diseases, and occurs when drinking wine. However, the observed positive relationships are not a reason to recommend that people who do not consume alcohol should do so for health reasons. For example, moderate alcohol intake in women is also associated with an increased risk of breast cancer. The adverse relationships sometimes also differ between men and women. For example, a link has been found between a higher risk of diabetes and the consumption of beer by men and the consumption of spirits by women, respectively. Sometimes, differences were also observed between men and women in the quantities of alcohol at which the relationships are found, as in the links between beer and wine consumption and mortality, respectively, regardless of cause of death. The guideline does not distinguish between types of alcoholic beverages, since bias in the study cannot be excluded.

Drinking more than one alcoholic drink per day does not result in greater health benefits and is unfavourable due to the increased risk of stroke, breast cancer, colon cancer and lung cancer associated with such a level of consumption. Furthermore, binge drinking is

harmful. In addition to the described chronic diseases, alcohol consumption can also lead to an increased risk of, for example, accidents, addiction, psychosocial problems, liver cirrhosis and head and neck cancer. Women who want to become pregnant, are pregnant or breastfeeding, are recommended not to consume alcohol. In the Netherlands, around 27 per cent of adult men and 49 per cent of adult women do not drink alcohol. Twenty-eight per cent of men and 31 per cent of women drink no more than one glass of an alcoholic beverage per day on average, and 45 per cent of men and 20 per cent of women drink more than one glass of an alcoholic beverage per day on average. Fourteen per cent of men drink over six glasses of an alcoholic beverage a day, at least once a week. Seven per cent of women drink more than four glasses of an alcoholic beverage a day, at least once a week.

Guideline: Do not drink alcohol, or at least no more than one glass per day. [The guidelines from 2006 recommended limiting one's alcohol intake to one glass (women) or two glasses (men). The current data suggests that the guideline for men should be adjusted downwards.]