Alcohol

June 2023

This position statement is informed by the latest published research and contemporary international guidelines. The Heart Foundation provide recommendations on alcohol for people with or at risk of cardiovascular disease (CVD). This position statement replaces the 'alcohol' position statement and evidence paper (2013).

RECOMMENDATIONS TO REDUCE THE RISK OF ALCOHOL-RELATED HARM

The wider harms of alcohol use (beyond heart health) to whānau and communities were considered in development of these recommendations. Recommendations for adults including those living with a heart condition or at increased risk were developed for this position statement. The impact of alcohol consumption in people under 18 years, pregnant and/or breastfeeding women were drawn directly from the substantial body of evidence already available. This position statement was developed with support from Alcohol Healthwatch and aligns with national and international position statements on alcohol intake.

Statement 1: Adults including the general population, those living with a heart condition or at increased risk of heart disease

- There is no safe level of alcohol consumption.

- If you don't drink alcohol – don't start. If you do drink alcohol – it's better to drink less.

- The less you drink, the lower your risk of alcohol-related harm.

- Any reduction in alcohol intake will lower your risk of alcohol-related harm.

Statement 2: People under 18 years of age

- To reduce the risk of alcohol-related injury and other harms to health, people under 18 years of age should not drink alcohol.

Statement 3: Women who are pregnant and/or breastfeeding

- To lower the risk of alcohol-related harm to the woman, the developing foetus and baby, women who are pregnant or planning a pregnancy should not drink alcohol.

- To lower the risk of alcohol-related harm to the woman and baby, women who are breastfeeding should not drink alcohol.

EXECUTIVE SUMMARY

Alcohol is a psychoactive substance and the most used drug in Aotearoa New Zealand, with four out of every five (79%) adults (aged 15 years and over) reporting drinking alcohol in the past year.

The Heart Foundation assessed available evidence on the relationship between alcohol intake and heart health outcomes up to February 2023. This position statement is informed by *Canada's Guidance on Alcohol and Health* (2023) and the *Australian Guidelines to Reduce Health Risks from Drinking Alcohol* (2020) (1, 2). Published research on alcohol and secondary prevention of heart disease was reviewed to inform recommendations for people with risk factors for heart disease, or with heart disease.

The results of some older observational studies indicate that drinking alcohol in moderation offers protection against coronary heart disease. However, there is now a greater body of evidence that clearly indicates that any amount of alcohol increases the risk of heart disease. Alcohol causes harm to individuals, whānau and communities and contributes significant economic burden to the health, welfare and justice sectors. Certain populations including Māori whānau, Pasifika and people on a low income are disproportionately affected by alcohol-related harm.

The Heart Foundation does not recommend drinking alcohol to improve heart health. There is strong evidence that alcohol intake increases the risk of high blood pressure (hypertension)[1], a major risk factor for heart disease and stroke. Alcohol also increases the risk of atrial fibrillation and haemorrhagic stroke and may also increase the risk of heart failure and ischaemic heart disease. There is limited evidence on the impact of alcohol consumption on people living with heart disease. Emerging evidence from clinical trials suggests reducing alcohol consumption or stopping completely reduced atrial fibrillation recurrence and heart failure progression. In the absence of substantive evidence, it is reasonable to recommend people with heart disease follow the same advice as people without heart disease.

Health professionals have an important role to routinely ask about alcohol use, raise awareness of the health risks associated with alcohol use, and support people to reduce their alcohol consumption.

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[1] High blood pressure is considered to be equal to or higher than 140mmHg systolic or 90mmHg diastolic.

KEY OUTCOMES

There is high certainty evidence from observational studies that alcohol consumption increases the risk of high blood pressure (hypertension[2]) (3). For each 10g increase of pure alcohol per day (1 standard drink[3]) the risk of high blood pressure increases by 6% (3).

There is moderate certainty evidence from 32 randomised controlled trials (N=767) showing high doses of alcohol (>30g in men which is equivalent to 3 standard drinks[3], >20g in women which is equivalent to 2 standard drinks[3]) increased systolic (+3.7mmHg) and diastolic (+2.4mmHg) blood pressure ≥13 hours after alcohol consumption (4).

There is moderate certainty evidence from observational studies that alcohol consumption increases the risk of atrial fibrillation (5). For each 12g increase of pure alcohol per day (~1 standard drink[3]) the risk of atrial fibrillation increases by 8% (5).

Any reduction in alcohol use is beneficial for heart health (1). The alcohol-related harm associated with increasing risk of CVD can be reversed when alcohol intake is reduced or removed (1). People who consume high levels of alcohol have the most to gain by reducing their alcohol consumption (1).

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[2] High blood pressure is considered to be equal to or higher than 140mmHg systolic or 90mmHg diastolic.
[3] In Aotearoa New Zealand, a standard drink contains 10 grams of pure alcohol. This is equivalent to one 330ml bottle of beer (4% alcohol), 100ml wine (12.5% alchol) or 30ml spirits (42% alcohol).

BACKGROUND

Definition of alcohol

Alcohol (also known as ethanol) is a toxic psychoactive[4] substance with dependence producing properties (6). It is produced by fermenting or distilling produce or grains. Fermented beverages include beer, cider, wine and flavoured purified alcohol which range from 0.5% to 20% alcohol by volume (ABV) (1). Distilled beverages (spirits), include vodka, gin and whisky which are usually 25% ABV and higher (1).

How alcohol affects the body

Alcohol has immediate effects on the brain (2). Alcohol reduces activity in the brain's arousal, motor and sensory centres, leading to reduced reactions to stimuli (2). It also affects coordination, speech, cognition and the senses (2). Alcohol increases the risk of accidents, injury, physical violence and death during and immediately after drinking and may place others at risk of harm (2). Alcohol has considerable toxic effects on the digestive and cardiovascular systems and is a causal factor in more than 200 diseases, injuries and other health conditions (6).

Alcohol and heart health

Alcohol can affect the cardiovascular system in multiple ways (7, 8).

Key mechanisms include:
- Alcohol affects the function of the endothelium (the thin membrane that lines the inside of the heart and blood vessels) (9). The ability to dilate the arteries in response to increased blood flow becomes gradually compromised with increased alcohol use (9).

- Alcohol causes calcification in both aortic and coronary arteries which is a marker for subclinical atherosclerosis (build-up of plaque and narrowing of artery walls) (9).

- Chronic alcohol use impairs the feedback system between the autonomic nervous system and the heart and affects vascular tone and heart rate (9). Alcohol has been shown to increase heart rate and constriction of peripheral arteries (9).

- Alcohol disrupts blood vessel function through oxidative stress and initiates mechanisms which lead to high blood pressure such as contributing to the inelasticity and thickness of arteries (9).

Alcohol use in Aotearoa New Zealand

In the 2021/22 New Zealand Health Survey (NZHS) 79% of adults (aged 15 years and over) reported drinking alcohol in the past year (10). Men (84%) were more likely to drink than women (75%) (10).

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[4] A drug or other substance that affects how the brain works and causes changes in mood, awareness, thoughts, feelings, or behaviour.

Hazardous drinking

In the 2021/22 NZHS, of those who drank alcohol in the last year, one in five adults (19%) were classified as hazardous drinkers[5] equating to approximately 986,500 drinkers (10, 11). Men (25%) were twice as likely as women (13%) to be hazardous drinkers (10). Young adults aged 18-24 years consistently report the highest levels of hazardous drinking (31%), when compared to all other age groups (10).

There is disproportionate harm from alcohol experienced by Māori whānau, Pasifika and low income populations (12). Nearly half of Māori men (43%) and one quarter of Māori women (24%) reported hazardous drinking (10). While the prevalence of drinking alcohol is lower in Pasifika, those who do drink tend to do so more harmfully (13). Pasifika drinkers were 1.4 times more likely to report hazardous drinking than non-Pasifika drinkers, with more men (47%) compared to women (27%) (10).

Young people

A young person's brain continues to develop in their 20s and is particularly susceptible to the effects of alcohol (14). Heavy drinking by young people can have adverse effects on physical and cognitive development and can lead to issues with learning and memory. People up to the age of 25 experience more harm per standard drink than older drinkers and are more vulnerable to alcohol-related harm because their alcohol use in social situations can contribute to a pattern of risk-taking behaviour (2).

The New Zealand Youth19 Survey has demonstrated positive reductions in drinking behaviours of young people over time. The proportion of secondary school students who had 'never drunk alcohol' increased from 26% in 2007 to 45% in 2019 (15). However, for secondary students who do drink, binge drinking remains a dominant drinking pattern (15).

Pregnancy and breastfeeding

Alcohol consumption during pregnancy interferes with normal fetal development and increases the risk of negative outcomes, including Fetal Alcohol Spectrum Disorder (FASD) (16, 17). The incidence of FASD in Aotearoa New Zealand is estimated to be around 3% of live births (17). Prenatal alcohol exposure is considered a key factor in the development of congenital heart disease (18-20). The timing and duration of exposure, the amount of alcohol used per occasion, maternal wellbeing, and genetics influence the impact of alcohol consumption (17).

Alcohol consumption during breastfeeding also causes harm. A baby's brain keeps developing after it is born and is more sensitive to damage from alcohol than an adult brain (2). Levels of alcohol in milk closely parallel maternal blood alcohol concentrations and if a mother breastfeeds her baby while there is still alcohol in her breastmilk, the baby also drinks the alcohol (2, 21).

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[5] 'Hazardous drinking' is defined as a score of 8 points or more on the 10 question Alcohol Use Disorders Identification Test (AUDIT) which includes questions about alcohol use, alcohol-related problems and abnormal drinking behaviour.
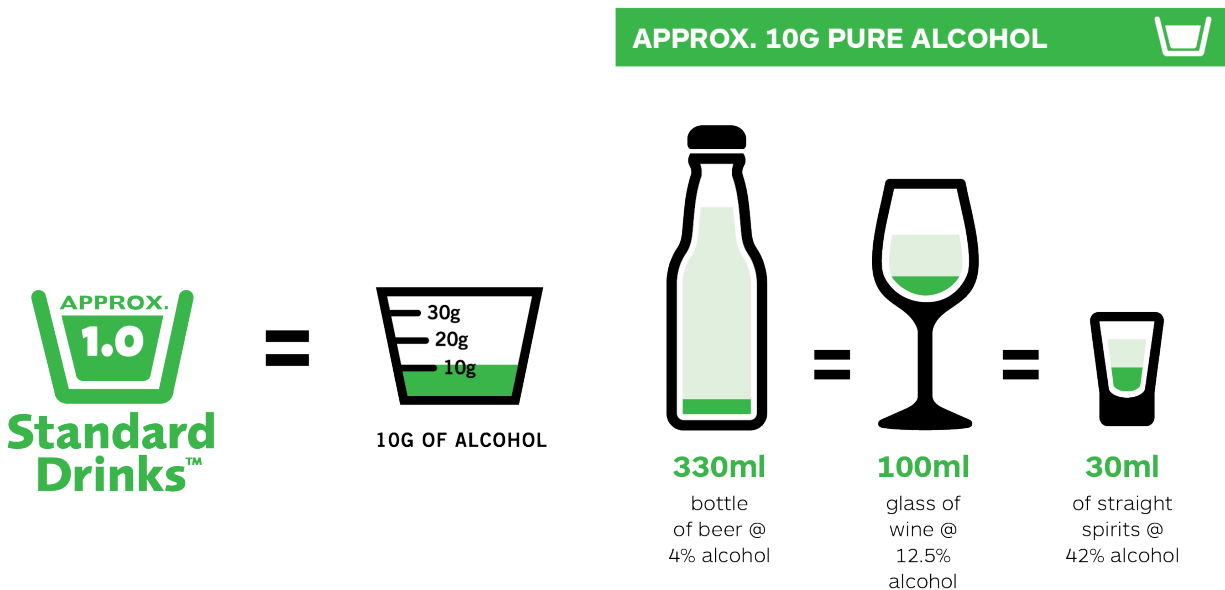
Alcohol affordability in Aotearoa New Zealand

Alcohol in Aotearoa New Zealand has become more affordable over time (22, 23). Cheap alcohol prices lead to higher alcohol consumption, increasing the risk of alcohol-related harm (24). Most alcohol is sold from off-licences, including bottle stores (43%) and supermarkets (32%) (22). Over half (55%) of drinkers purchase alcohol on sale or promotion (22).

Alcohol pricing policies are likely to have the greatest impact on consumption levels in Aotearoa New Zealand (25). There are currently no minimum pricing restrictions for alcohol in Aotearoa New Zealand (22). A study of 22 off-licenses in Tāmaki Makaurau (Auckland) found most alcohol categories have a budget range, with beer, cask wine and bottled wine being sold for less than $1 per standard drink, and spirits, RTDs and cider being sold at $1.20 or less per standard drink (22).

Current NZ guidelines

The Ministry of Health currently recommends the following to reduce long-term health risk (26):

- **Women:** no more than 2 standard drinks[6] a day and 10 standard drinks[6] a week
  and at least 2 alcohol-free days every week.
- **Men:** no more than 3 standard drinks[6] a day and 15 standard drinks[6] a week
  and at least 2 alcohol-free days every week.

APPROX. 10G PURE ALCOHOL

APPROX. 1.0 Standard Drinks™ = 30g 20g 10g — 10G OF ALCOHOL

330ml bottle of beer @ 4% alcohol = 100ml glass of wine @ 12.5% alcohol = 30ml of straight spirits @ 42% alcohol

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[6] In Aotearoa New Zealand, a standard drink contains 10 grams of pure alcohol. This is equivalent to one 330ml bottle of beer (4% alcohol), 100ml wine (12.5% alchol) or 30ml spirits (42% alcohol

RESEARCH QUESTIONS

Q1   What is the relationship between consuming alcohol and the risk of cardiovascular disease[7] (CVD) and mortality in adults?

Q2   What is the relationship between consuming alcohol and heart health outcomes for people with hypertension or established CVD[7]?

EVIDENCE FOR ALCOHOL AND HEART DISEASE

To inform this updated position statement, the Heart Foundation's Expert Nutrition Policy (ENP) working group, with co-opted expertise, followed the process outlined below to consider the available scientific evidence on alcohol and heart disease. The evidence on the wider harms of alcohol use were considered in development of the recommendations, but is not reported on in this document (1, 2).

This position statement was largely informed by *Canada's Guidance on Alcohol and Health,* published in 2023 by the Canadian Centre on Substance Use and Addiction (CCSUA) (1). The ENP working group accepted the evidence underpinning the CCSUA guidelines drawn primarily from a technical report on the health effects of alcohol consumption (5). The *Australian Guidelines to Reduce Health Risks from Drinking Alcohol*, published in 2020 by the National Health and Medical Research Council (NHMRC), was also considered for the heart health outcomes of interest not reported in the CCSUA guidelines (2). These outcomes included coronary heart disease (CHD) incidence, heart failure and acute cardiovascular events (2). The ENP working group accepted the methodology used by the CCSUA and NHMRC for selecting and assessing the evidence base, i.e. use of the AMSTAR[8] and GRADE[9] systems (5, 27). A summary of the GRADE[8] assessments can be found in **Appendix 1** (5, 27).

A systematic search utilising PubMed and Cochrane databases was conducted from January 2017 to February 2023 to identify recent systematic reviews, meta-analyses of trials, or prospective observational studies on alcohol intake and heart health outcomes with a particular focus on people with, or at high risk, of CVD. Due to the limited evidence identified, commentary on one Cochrane Review, two systematic reviews, two cohort studies and two randomised controlled trials (RCT) were included (4, 28-33). One systematic review was assessed using a tool to determine the risk of bias in systematic reviews (ROBIS)[10] to determine whether it could be used to inform the evidence base of this position (28). Evidence on alcohol-related cardiomyopathy was of interest but very few high-quality studies are available. Commentary on one systematic review and two narrative reviews was included (34-36).

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[7] The Heart Foundation is most interested in the following cardiovascular diseases: coronary heart disease, atrial fibrillation, and heart failure. For this position statement the Heart Foundation is also interested in alcohol-related cardiomyopathy.

[8] AMSTAR is a tool used to assess the reporting quality of systematic reviews. It covers risk of bias and publication bias.

[9] GRADE (Grading of Recommendations Assessment, Development and Evaluation) is a framework to assess the certainty of the evidence. High, moderate, low, or very low is used to describe confidence in the certainty of the effect for each outcome.

[10] ROBIS is a tool designed specifically to assess the risk of bias in systematic reviews.

What is meant by U- or J- shaped curve?

When the evidence for the association between alcohol and health outcomes is described as a U- or J-shaped curve this indicates that 'never' or 'seldom' drinkers and 'heavy' drinkers have higher risk of developing a cardiovascular related outcome than 'moderate' drinkers. Most evidence showing a U- or J- shaped curve is derived from observational studies (cohort or case-controlled studies) and the certainty of evidence is described as 'very low' to 'low'. A recent meta-analysis of 87 studies including a combined population of 3,998,626 people, found that after eliminating studies with biases in the methodology the remaining high-quality studies found no evidence that moderate drinking reduced mortality (37).

Q1: What is the relationship between consuming alcohol and the risk of cardiovascular disease (CVD) and mortality in adults?

Short term health risks

Myocardial infarction (MI) or coronary event

Evidence from four case-control and five case-crossover studies (N cases = 17,966), reported a U-shaped dose-response association between alcohol consumption in the previous 24 hours and risk of MI or a coronary event (27). There was a 59% greater risk of MI or a major coronary event with alcohol consumption of around 108g alcohol in one day (equivalent to ~11 standard drinks) (27). The NHMRC assessed this evidence as 'very low' certainty using the GRADE framework (27).

Stroke

Evidence from 8 case-control and 1 case-crossover study (N cases=2,599), reported a dose-response association between alcohol consumption and ischaemic stroke (27). This association indicates a linear dose-response within 24 hours and a U-shaped dose-response association within 1 week (27). There was a 2.25-fold higher risk of ischaemic stroke in the week following consumption of around 225g (19 standard drinks/week)(27). Evidence from 6 case-control and 1 case-crossover study (n cases=1,262), reported a dose-response association between alcohol consumption and haemorrhagic stroke. This association indicates a U-shaped dose-response within 24 hours and a linear dose-response association within 1 week (27). There was a 3.33-fold higher risk of haemorrhagic stroke in the week following for any alcohol consumption when compared to no drinking (27). The NHMRC assessed this evidence as 'very low' certainty using the GRADE framework (27).

Long-term health risks

Coronary heart disease (CHD) mortality

Evidence from 45 prospective cohort studies (N=2,913,140 participants) identified an association between low-level alcohol consumption (defined as 1.2g to 24.99g alcohol per day) and a 20% reduced risk of death from CHD (38). In studies where the mean age was 55 years or younger at baseline, there was a 45% increased risk of death from CHD for former and occasional drinkers,

compared with abstainers (38). Only seven studies had a reference group of strictly defined lifetime abstainers. The CCSUA assessed this evidence as 'low certainty' using the GRADE framework (5).

CHD incidence (including MI, CHD, non-stroke cardiovascular disease, and other coronary events)

Evidence from 18 prospective cohort studies (N=214,340), reported a J-shaped association between alcohol consumption and CHD, which presents concerns around the validity (5). Low levels of alcohol consumption (≤3 standard drinks per day, 12g alcohol per drink) gave a small decreased risk of CHD, with no difference in risk of CHD at higher levels of consumption. The NHMRC assessed this evidence as 'very low' certainty using the GRADE framework (4).

Hypertension

Evidence from 31 prospective cohort studies (N=414,477), reported a linear dose-response relationship between increased alcohol consumption and an increased risk of hypertension (3). For each 10g increase of alcohol per day (equivalent to 1 standard drink[11]) the risk of hypertension increased by 6% (3). For 50g/day of alcohol, the risk of hypertension was 35% higher in comparison to non-drinkers (3). The CCSUA assessed this evidence as 'high certainty' using the GRADE framework (5).

Atrial fibrillation

Evidence from 7 prospective cohort studies (N=198,485), reported a dose-response association between chronic alcohol consumption and atrial fibrillation, when compared with lifetime abstainers (27). The linear dose-response analysis reported that for every additional 12g per day of alcohol the risk of atrial fibrillation increased by 8% (27). The CCSUA and NHMRC assessed this evidence as 'moderate certainty' using the GRADE framework (4, 5).

Two recently published systematic reviews and meta-analysis by Jiang et al (2022) and Zhang et al (2022) show similar associations between alcohol consumption and atrial fibrillation, with a stronger association found in men (39, 40). In addition, the highest level of alcohol consumption was associated with a 30% greater risk of atrial fibrillation when compared with never or occasional drinkers (40).

Heart failure

Evidence from 8 prospective cohort studies (N=202,378) indicate that at low levels of alcohol consumption (≤7 standard drinks per week, 12g alcohol per drink) there is a small decreased risk of heart failure when compared to non-drinkers, however, there is no difference in risk of heart failure for higher levels of consumption (27). The NHMRC assessed this evidence as 'very low' certainty using the GRADE framework.

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[11] In Aotearoa New Zealand, a standard drink contains 10 grams of pure alcohol. This is equivalent to one 330ml bottle of beer (4% alcohol), 100ml wine (12.5% alchol) or 30ml spirits (42% alcohol).

A meta-analysis of 13 prospective cohort studies by Larsson et al (2018) (N=355,804) found similar results (41). However, in addition former drinking was associated with a 22% greater risk of heart failure when compared with never or occasional drinking (41).

Stroke
Evidence from 25 prospective cohort studies (N=73,587), reported a J-shaped association between alcohol consumption and ischaemic stroke which presents concerns around the validity (27). When compared to the reference group (non-drinkers, never drinkers or occasional drinkers), there was an 8-10% decreased risk for ischaemic stroke in those who consumed ≤2 drink per day, 8% increased risk in those who consumed 2 to 4 drinks per day and 14% increased risk in those who consumed >4 drinks per day (27). Evidence from 11 prospective cohort studies reported a stronger association between heavy drinking and haemorrhagic stroke (27). There was a 67% increased risk of intracerebral haemorrhage (N cases=2,359) and 82% increased risk of subarachnoid haemorrhage (N cases=1164) with chronic alcohol consumption >4 drinks per day, when compared with non-drinkers, never drinkers, or occasional drinkers (27). The NHMRC assessed this evidence as 'very low' certainty using the GRADE framework.

Alcohol-related cardiomyopathy
Alcohol-related cardiomyopathy[12] may be diagnosed when a person has a history of heavy alcohol use over a period of years. A systematic review by Rehm et al (2017) noted there are not enough studies on the dose-response relationship between alcohol and cardiomyopathy risk to enable meta-analyses (36). However, some data suggests heavy drinking (≥80g alcohol per day, equivalent to 8 standard drinks) over several years is associated with a higher risk of cardiomyopathy (36). More evidence is needed to understand the aetiology of cardiomyopathy and its relationship with alcohol consumption (34, 35).

Risk factors
Blood pressure
A Cochrane review of 32 randomised controlled trials (N=767) looked at the association between alcohol and blood pressure in healthy and hypertensive adults (4). High dose alcohol (defined as >30g alcohol in men and >20g alcohol in women) decreased systolic (-3.5mmHg) and diastolic (-1.7mmHg) blood pressure, and increased heart rate (+5.8bpm) up to 12 hours after consumption (4). After 13 hours, systolic (+3.7mmHg) and diastolic (+2.4mmHg) blood pressure and heart rate (+2.7bpm) increased (4). These findings are relevant to mainly healthy males, as small numbers of women (N=125) were included and small numbers of participants with hypertension (10%) and coronary heart disease (6.3%) (4). The authors assessed this evidence as 'moderate' certainty using the GRADE framework (4).

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[12] Cardiomyopathy refers to a group of conditions which affect the heart muscle's ability to pump blood to the body. When left untreated, cardiomyopathy can lead to heart failure.

A systematic review and meta-analysis of 36 trials (N=2,865) by Roerecke et al (2017) examined the effect of reducing alcohol consumption on blood pressure in healthy and hypertensive adults (29). Trials had a follow-up period ranging from 1 week to 2 years (median 4 weeks) (29). The overall effect of reducing alcohol consumption across all trials was a reduction in systolic (−3.13mmHg) and diastolic (−2.00mmHg) blood pressure (29). For people who had an alcohol intake >24g/day (equivalent to 2 Swedish standard drinks), a reduction in alcohol intake significantly reduced blood pressure, with the greatest effect among participants who drank ≥6 drinks/day when intake was reduced by 50% (29). Findings of this review are relevant mainly to males, as very few women (N=113) were included (29).

Q2: What is the relationship between consuming alcohol and heart health outcomes for people with hypertension or established CVD?

CVD mortality
A 2021 meta-analysis by Ding et al. looked at the association between alcohol consumption and CVD mortality and events in patients with previous MI, angina or stroke (28). The study combined UK health survey data with 12 prospective cohort studies (N=31,235) (28). A J-shaped association was reported between alcohol intake and CVD mortality and events when compared to current non-drinkers which presents concerns around the validity (28). This systematic review was assessed with ROBIS[13] as having a 'high risk of bias' due to using non-drinkers as the reference group and no adjustment for social factors.

Recurrence of atrial fibrillation
In a randomised trial, participants with atrial fibrillation (N=140) were randomised to abstain from alcohol or continue their usual alcohol consumption for six months (32). Patients in the abstinence group reduced alcohol intake from 16.8 to 2.1 standard drinks per week, and patients in the control group reduced alcohol intake from 16.4 to 13.2 standard drinks per week (32). Atrial fibrillation recurred in 53% of patients in the abstinence group and 73% of patients in the control group (32). The abstinence group had a longer period before recurrence of atrial fibrillation and a significantly lower burden of atrial fibrillation over six months (32). A cohort study (N=3,474) assessed the effect of alcohol abstinence on atrial fibrillation recurrence following the procedure of ablation[14] (31). Alcohol reduction was associated with a 37% lower risk of atrial fibrillation/atrial tachycardia recurrence (31). The benefit of alcohol reduction was greatest in the subgroup whose baseline alcohol consumption was highest at ≥120g/week (31).

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[13] ROBIS is a tool designed specifically to assess the risk of bias in systematic reviews.
[14] Catheter ablation is a procedure used to treat atrial fibrillation.

Atrial fibrillation and risk of stroke

A cohort study (N=97,869) aimed to evaluate the association between a change in alcohol consumption after being newly diagnosed with atrial fibrillation and the risk of ischaemic stroke. Patients were categorised into three groups according to their level of alcohol consumption: non-drinkers; abstainers from alcohol after atrial fibrillation diagnosis; and current drinkers (30). At 7 years follow-up, abstainers had a 14% reduced risk for stroke and non-drinkers had a 25% reduced risk, compared to current drinkers (30).

Progression of heart failure

In the secondary analysis of a randomised trial (STOP-HF[15]) patients (N=744) at risk of heart failure or with pre-heart failure were categorised into three groups according to their alcohol consumption: non-drinkers; low alcohol use (<70g/week) and moderate-high alcohol use (≥70g/week). (33). At 5-year follow-up, the group with the highest alcohol consumption (moderate-high alcohol usage) was associated with a 4.5-fold increased risk of heart failure progression[16] amongst those with pre-heart failure at baseline (33).

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[15] Screening TO-Prevent Heart Failure (STOP-HF)

[16] Progression of Stage B pre-heart failure was defined as follow up left ventricular dysfunction (EF <50%) and a decline of at least 5% and/or lateral E/e' >13 increase of at least 2 units.

DISCUSSION

This position statement summarises contemporary evidence on the association between alcohol and heart health outcomes and provides recommendations for adults including those with or at risk of heart disease. Evidence of the association between alcohol and broader health outcomes in young people, pregnant and/or breastfeeding women was not assessed, however, due to the substantial evidence available, recommendations for these groups were included.

Alcohol causes harm to whānau and communities, is a key contributing driver of health inequities and is a significant burden and cost to the health, welfare and justice sectors in Aotearoa New Zealand (42). Alcohol is a leading risk factor for global disease burden, results in substantial loss of health across the life course (43). In 2018, harmful alcohol use cost Aotearoa New Zealand an estimated $7.85 billion annually (23). There is strong evidence that alcohol consumption increases the risk of hypertension and many cardiovascular diseases (5). There is strong evidence that alcohol increases the risk of many cancers, with particularly strong evidence for breast and colorectal cancers (5).

Summary of findings

There is strong evidence of a dose-response association between alcohol and an increased risk of high blood pressure (3). Given around 20% of adults in Aotearoa New Zealand are living with high blood pressure there is potential for significant public health gain with alcohol reduction (10). There is moderate certainty evidence of a dose-response association between alcohol and an increased risk of atrial fibrillation (5).

The Heart Foundation does not recommend drinking alcohol to improve heart health (5). For people who do drink alcohol, the advice is that it's best not to drink, but if you do choose to drink, drinking less reduces your risk. This is consistent with the latest recommendations from the World Heart Federation (2022) and represents the contemporary view on the association between alcohol and heart disease (44).

What's changed?

The latest evidence provides greater certainty of the effect of alcohol on heart disease outcomes and indicates there is no safe level or protective effect from alcohol. There has consistently been consensus that high alcohol intake and heavy drinking is associated with an increased risk of CVD. However, there is now more evidence to disprove the belief that low to moderate alcohol use is cardioprotective.

The evidence in this position statement showing a U- or J- shaped association with alcohol use (suggestive of a cardioprotective effect of moderate drinking) is of 'low' or 'very low' certainty. It is unlikely that the U or J shaped curve represents the true association between alcohol use and cardiovascular disease outcomes. Low or non-drinking categories in cohort studies often include "sick quitters[17]" and a higher socio-economic status (SES) is often associated with moderate drinking (44).

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[17] "sick quitters" refer to people who stop drinking after a diagnosis or when they experience symptoms of disease.

Therefore, the U- or J- shaped curve is likely due to a combination of issues with drinking categorization and residual confounding.

No randomised controlled trials have shown the potential heart health benefits of alcohol such as lowering cholesterol. Additionally, mendelian randomisation studies, which are much less subject to confounding, have demonstrated that genotype-predicted alcohol intake[18] has a continuously positive log-linear association with intracerebral haemorrhage, ischaemic stoke and blood pressure (44, 45). Alcohol consumption of any amount has been associated with increased cardiovascular risk (8, 46).

Gender and sex differences

Men drink more alcohol than women, and are more likely to drink in excess and experience more alcohol-related harm (1). Men and women are thought to process alcohol differently due to enzymes, genes, body size, organ function and metabolism (1). The recent Canadian guidelines suggest that health risks increase more steeply for females than for males, once alcohol consumption is above six Canadian standard drinks per week (which is equivalent to 8 standard drinks[19] in Aotearoa New Zealand) (1).

Any reduction in alcohol consumption is beneficial

The latest evidence demonstrates that any reduction in alcohol use is beneficial for heart health (1). The alcohol-related harm associated with increasing risk of CVD can be reversed when alcohol intake is reduced or removed (1). Reductions in alcohol consumption can result in improvements in liver function, insulin resistance, weight, blood pressure and cancer-related growth factors (1). Reductions in alcohol consumption also decrease the risk of hypertension, cancer, atrial fibrillation, stroke, diabetes, pancreatitis and liver cirrhosis (1). People who consume high levels of alcohol have the most to gain by reducing their alcohol consumption (1).

Reducing alcohol-related harm

Aotearoa New Zealand has a national framework (2022), as a tool to support communities to minimise alcohol-related harm (47). The Te Tiriti o Waitangi-aligned Alcohol Harm Minimisation framework is based on the World Health Organisation's (WHO) SAFER initiative and is structured around policy and culture changes (47). A range of strategies are needed to shift communities towards de-normalising alcohol consumption, such as delaying the initiation of alcohol use in younger people, and making hazardous drinking socially unacceptable (47). Collaboration between government, employers, healthcare providers and community stakeholders is required to create effective policy to change the wide accessibility and promotion of alcohol in our society, which will support people to make healthier choices around their consumption.

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[18] Genotype-predicted alcohol intake is referring to the fact there are genetic variants that affect and alter alcohol metabolism.

[19] In Aotearoa New Zealand, a standard drink contains 10 grams of pure alcohol. This is equivalent to one 330ml bottle of beer (4% alcohol), 100ml wine (12.5% alchol) or 30ml spirits (42% alcohol).

Challenges in reducing alcohol

Within the context of the current cost of living crisis, alcohol is increasingly affordable, easy to access, widely promoted and highly visible to young people and whānau (48). There is a greater density of alcohol outlets in more deprived communities, which presents an equity issue as it is directly linked to higher alcohol consumption and associated harms (42). People who are exposed to alcohol marketing are more likely to start drinking at a younger age and participate in hazardous drinking behaviours (48). Tamariki Māori and Pasifika children are exposed to alcohol marketing at a rate of 5.4 and 3 times higher than Pākehā children (48). More recently, the digital marketing of alcohol has increased particularly on social media (42, 49-51). Digital marketing is often directed at young people and has been linked to an increased consumption of alcohol in young people (42, 49).

To date, the Sale and Supply of Alcohol Act 2012 has been ineffective in controlling accessibility and availability of alcohol, or providing sufficient control to communities (42).

Zero and low alcohol products

Zero alcohol products contain ≤0.5% alcohol by volume, yet retain the name and branding of alcohol products, and may mimic the taste of alcohol (52). Since 2019, consumption of no and low alcohol beer has increased by 750% (53). Zero and low alcohol products provide an alternative to full-strength drinks containing alcohol and may help some people to reduce their alcohol use or stop completely, however, they should only be consumed as an alternative to full strength drinks when alcohol would usually be consumed on standard drinking occasions (54). The evidence for harm reduction and improved health from consuming zero and low alcohol products is limited and further research is needed (54, 55). These products provide an opportunity for alcohol companies to extend their brands through increased marketing opportunities which may more readily reach young people (52).

Dietary patterns and alcohol

Some dietary patterns, such as the traditional Mediterranean diet, may include low amounts of alcohol with meals (56). This eating pattern is well-researched, with evidence from 30 clinical trials (N=12,461) showing a small positive impact on cardiovascular risk factors such a blood pressure and cholesterol (57). Evidence from 40 clinical trials (N=35,548) shows the Mediterranean eating pattern reduces death from CVD and non-fatal myocardial infarction in patients with increased CVD risk (58). However, the evidence is for the total dietary pattern, so the effects of alcohol cannot be separated from the health benefits of the overall diet. Alcohol is not a defining feature of a heart-healthy eating pattern, and is not recommended for heart health, despite inclusion of alcohol in some traditional diets.

Priority groups
Older adults

Aotearoa New Zealand's alcohol use is projected to increase over the next decade, and the increase is likely to be driven by adults aged 50 years and over (59, 60). Rising alcohol use in older adults is of

concern because this population may be at greater harm from alcohol use than younger drinkers (59). This outcome is due to an increased age-related sensitivity to alcohol, the potential for interactions with prescribed medications, chronic or complex illnesses and mental illness affected by alcohol (61). Recent research has demonstrated the need for enhanced screening of alcohol use in adults ≥50 years who attend primary care, due to alcohol-related issues being mistaken for age-related illness or decline (62).

Pregnant women

Alcohol permanently damages the brain and body of a growing fetus, and fetal alcohol spectrum disorder (FASD) is the leading cause of preventable intellectual disability (61). Around 40% of pregnancies are unplanned in Aotearoa New Zealand, with 50% of pregnancies exposed to alcohol (and 10% exposed to high levels of alcohol) (61). In the 'Growing Up in NZ' Longitudinal Cohort Study (N=6,822), 71% of women reported drinking alcohol prior to pregnancy or before becoming aware of their pregnancy (63). A quarter of women (23%) reported drinking during the first trimester, reducing to 13% after the first trimester (63).

Māori

In Māori communities, many of the factors related to alcohol consumption are symptomatic of broader social issues related to inequity and colonisation (64). The place of alcohol for Māori whānau is within the context of other issues, which require holistic and systems-based action to prevent harm and promote positive public health outcomes (64). Mātauranga Māori (Māori knowledge) may be a protective factor for Māori and alcohol consumption but needs more research (64). Amohia te Wairoa means to 'uphold wellness' and is a national campaign aiming to break the cycle of alcohol harm and an example of addressing alcohol in a mana-enhancing, community-owned and strengths based way (65).

Pasifika

Patterns of alcohol use vary between different Pasifika subpopulations (13). Pasifika born in NZ are more likely to drink alcohol, and drink hazardously, compared to those born overseas (13). There have been promising declines over the last 16 years in Pasifika youth alcohol consumption and binge drinking (66). Students with parents able to speak a Pacific language, and whose parents knew where they were are, are less likely to report binge drinking (66). More research is needed on the protective factors around alcohol use in Pasifika communities such as family dynamics and obligations, and cultural and religious practices (such as church attendance) (66).

Youth

Evidence shows that the longer a person delays drinking, the more they are protected from alcohol harm. Adolescence is a vulnerable period for the development of alcohol-use disorders. Around one-third of alcohol dependence cases develop within five years of first use. Close to 50% of cases develop by age 20 and 70% by age 25 (67).

Limitations

A limitation of the evidence is its reliance on observational studies.

Some of the limitations identified in the reviews include:
- measurement of alcohol use (self-reported use is subject to recall and social desirability bias)

- alcohol use groupings (sometimes former drinkers and lifetime abstainers are lumped together, other times it is unclear what the researchers did)

- healthy survival bias (greater participation in research by healthier individuals)

- limited generalisability (the dominance of research which recruited white, middle to upper socioeconomic status men and often small sample sizes)

- most studies assessed alcohol-outcomes based on weekly average levels of alcohol use and failed to account for the effects of drinking patterns (e.g. binge drinking or spacing out drinking over time) within those average levels. This makes it difficult to directly model how binge drinking affects the risk of disease and injury.

There is a lack of data on alcohol intakes for secondary prevention and this is an area where further research would be warranted. Ethically, randomised controlled trials cannot be undertaken where non or low alcohol drinkers are randomised to drink more, given the known health risks with higher intakes.

ADVICE FOR HEALTH PROFESSIONALS

Evidence for reducing alcohol needs to be considered within the context of other lifestyle factors that support optimal heart health including good nutrition, physical activity, managing stress, and sleep.

CVD risk assessment

The CVD Risk Assessment and Management for Primary Care guidelines recommend people with blood pressure ≥130/80mmHg and/or elevated triglycerides adopt a range of lifestyle measures, including drinking less alcohol, as a first line treatment over medication management (68).

Evidence for alcohol screening and brief intervention

Having conversations about alcohol across the health sector is an important strategy for reducing alcohol use, preventing progression to alcohol use disorders, identifying risk for alcohol withdrawal, and reducing alcohol-related harm. It is best practice to provide all patients with access to high quality culturally safe alcohol assessment, brief advice and referral to counselling as appropriate (43, 44, 69).

Behavioural and pharmacological therapies have shown to be effective treatments for alcohol use disorder across different settings including primary care and the emergency department (44). For people with severe alcohol use disorder, early identification of withdrawal symptoms and effective management is needed to prevent significant health risks such as seizures (70).

The Alcohol ABC Approach

The Alcohol ABC Approach is a model for assessment, brief advice and referral to counselling and other specialist help when required (71). The purpose of the Alcohol ABC Approach is to provide a standardised and systematic way of embedding alcohol conversations and intervention across the health system and everyday practice of health professionals (72).

A - Ask about alcohol	• Ask every patient about alcohol use and assess using an alcohol assessment tool.
	    o **Adults (aged ≥19 years):** assess alcohol use with the Alcohol Use Disorders Identification Tool for Consumption (AUDIT-C)(73).
	    o **Young people (aged 13-18 years):** assess alcohol use with the Substances and Choices Scale (SACS)(74).
	 • Use score to determine alcohol consumption and level of risk.
	
	 • The higher the score, the higher the risk of alcohol-related harm.

B - Brief advice	**Adults (aged ≥19 years) and young people (aged 13-18 years):** • Provide brief advice in the context of the presenting issues, age, sex, health conditions, co-morbidities or currently prescribed medications (73).

	• Brief advice is delivered to people assessed as drinking in a hazardous or harmful way above the current New Zealand guidelines.
	
	• This can include providing:
	    ○ feedback on the assessment score and discussing what this means
	    ○ the full 10-question AUDIT questionnaire for those drinking above the current NZ low-risk drinking guidelines
	    ○ brief advice about more appropriate levels of alcohol consumption for them in the context of their age and relevant health conditions
	    ○ where appropriate, encouragement for patients to access alcohol counselling.
	
	Young people (aged 13-18 years)
	• Provide SACS brief intervention (74).

C - Counselling	**Adults (aged ≥19 years) and young people (aged 13-18 years):**
	• Referral pathways should be considered and offered to people identified as drinking above the NZ guidelines, especially to those at high risk of alcohol problems or who require alcohol withdrawal management.
	
	• Refer people to an appropriate local alcohol support specialist service for a comprehensive assessment and tailored treatment plan.
	
	• Visit support.alcohol.org.nz for a list of services for different regions including Kaupapa Māori health and Pasifika health providers.
	
	• See national telehealth support and other resources below.
	
	National telehealth support: free confidential advice available 24/7.
	• **Adults (aged ≥19 years):**
	    ○ Alcohol Drug helpline 0800 787 797 or FREE TXT 8681
	    ○ Māori line 0800 787 798 or FREE TXT 8681
	    ○ Pasifika line 0800 787 999 or FREE TXT 8681
	
	• **Young people (aged 13-18 years):**
	    ○ Youth Helpline on 0800 787 984 or FREE TXT 8681
	
	Other resources:
	• Health Pathways: aucklandregion.communityhealthpathways.org/
	
	• Heart Foundation alcohol webpage: heartfoundation.org.nz/wellbeing/healthy-eating/nutrition-facts/alcohol-and-the-heart

	• Amohia te Wairoa: alcohol.org.nz
	• Health Navigator: healthnavigator.org.nz/healthy-living/a/alcohol-landing-page
	• The Royal NZ College of General Practitioners: Implementing Alcohol ABC Approach in Primary Care (2012).
	• Ministry of Health Alcohol ABC elearning module available via Learn Online learnonline.health.nz
	• Te Pou Substance Withdrawal Management: Guidelines for Medical and Nursing Practitioners (2021).

Key messages for patients and whānau

- There is no safe level of alcohol consumption.

- If you don't drink alcohol – don't start. If you do drink alcohol – it's better to drink less.

The benefits of drinking less:

- The less you drink, the better your health.

- No amount or type of alcohol is good for your health. It doesn't matter whether it is wine, beer, cider or spirits – it's all still alcohol.

- Heavy drinking (binge drinking) is associated with an increased risk of heart events including heart attack and stroke.

- Drinking alcohol increases your risk of high blood pressure (hypertension), which is an important risk factor for heart disease.

- Drinking alcohol increases your risk for atrial fibrillation (an irregular or rapid heart rate) and haemorrhagic stroke, and may increase your risk of heart failure, and heart disease.

- You can reduce your drinking over time. Any steps you can take to reduce the amount you drink will benefit your heart health.

Tips and advice for reducing alcohol consumption:

- Have alcohol-free weeks and weekends wherever you can.

- Choose alcohol-free activities or make your usual activities alcohol-free.

- Drink slowly.

- For every drink of alcohol, have a drink of water or soda water.

Importantly, if you are drinking six or more standard drinks a day and want to stop drinking, it's important to talk to your doctor first because suddenly stopping can be a risk to your health.

Common myths and misconceptions surrounding alcohol:

- Red wine should be treated the same as any other form/type of alcohol and should not be consumed for heart health benefits.

- 'Low carb' and 'low sugar' alcohol products may appear to be 'healthier' but usually contain the same amount of alcohol.

- 'Low' and 'zero' alcohol products may help some people to drink less alcohol, but still contain calories (kilojoules). The healthiest non-alcoholic drink is water – and it's usually free.

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APPENDIX 1

Certainty of outcomes

GRADE has four levels of evidence described in the table below.

Certainty	What it means
Very low	The true effect is probably markedly different from the estimated effect
Low	The true effect might be markedly different from the estimated effect
Moderate	The authors believe that the true effect is probably close to the estimated effect
High	The authors have a lot of confidence that the true effect is similar to the estimated effect

Importance of outcomes

The Heart Foundation determines the importance of each outcome and identifies them as either 'CRITICAL' or 'IMPORTANT'. The Heart Foundation views coronary heart disease risk and mortality as 'CRITICAL' outcomes from observational studies and blood pressure as 'CRITICAL' outcomes from randomised trials. This position statement is also informed by secondary 'IMPORTANT' outcomes including hypertension, atrial fibrillation, heart failure, myocardial infarction/coronary event and stroke.

Question 1: What is the relationship between consuming alcohol and cardiovascular disease (CVD) risk and mortality in adults?

Bibliography:

Update of Canada's Low-Risk Alcohol Drinking Guidelines: Evidence review technical report (5)
NHMRC: Evaluating the evidence on the health effects of alcohol consumption: Evidence evaluation report (27)

№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Total № of people	Relative risk (95% CI)	Absolute risk (95% CI)	Certainty	Importance
			Certainty assessment					Effect			
Association between alcohol consumption and coronary heart disease mortality											
45	Observational studies	Serious[a]	Not serious[b]	Not serious	Not serious	No publication bias detected	2,913,140	Current low volume drinkers RR=0.80 (0.69 to 0.93) All current drinkers RR = 0.88 (0.78 to 0.99)	N/A	⊕⊕ LOW	CRITICAL
Association between daily alcohol consumption and coronary heart disease incidence when compared to non-drinkers											
18	Observational studies	Serious[c]	Not serious[d]	Not serious	Not serious	Publication bias detected[e]	214,340	12g: RR=0.75 (0.70 to 0.80) 24g: RR=0.70 (0.66 to 0.75) 36g: RR=0.69 (0.64 to 0.75) 60g: RR=0.70 (0.64 to 0.77) 90g: RR=0.74 (0.67 to 0.83) 135g: RR=0.83 (0.67 to 1.04)	N/A	⊕ VERY LOW	CRITICAL
Association between daily alcohol consumption and hypertension in comparison to non-drinkers											
31	Observational studies	Not serious	Not serious[f]	Not serious	Not serious	Dose response	414,477	Each 10g alcohol: RR=1.06 (1.05 to 1.08) 50g alcohol RR=1.35 (1.25 to 1.45)	N/A	⊕⊕⊕⊕ HIGH	IMPORTANT

Association between daily alcohol consumption and atrial fibrillation (or atrial flutter) incidence											
7	Observational studies	Not serious[g]	Not serious	Not serious	Not serious	Dose-response	198,485	For every 12g increase RR 1.08 (1.06 to 1.10)	N/A	⊕⊕⊕ MODERATE	IMPORTANT
Association between alcohol consumption and heart failure (incidence, hospitalisation and/or mortality) compared with non-drinkers											
8	Observational studies	Serious[h]	Serious[i]	Serious[j]	Not serious	No publication bias detected	202,378	3 drinks*/week RR=0.90 (0.84 to 0.96) 7 drinks*/week RR=0.83 (0.73 to 0.95) 14 drinks*/week RR=0.90 (0.73 to1.10) 21 drinks*/week RR=1.07 (0.77 to 1.48) 1 drink = 12g ethanol	N/A	⊕ VERY LOW	IMPORTANT
Association between daily alcohol consumption and risk of myocardial infarction or coronary event											
9	Observational studies (case control and case cross-over)	Serious[k]	Serious[l]	Not serious	Not serious	No publication bias detected	n-cases=17,966	≈28g alcohol RR=0.67 ≈108g alcohol RR=1.59	N/A	⊕ VERY LOW	IMPORTANT

a   Included studies at unknown risk of bias but limited to prospective cohort studies only.

b   Heterogeneity was detected I^2 was greater than 38%. Further analyses were conducted and explored heterogeneity.

c   Included studies at unknown risk of bias but limited inclusion on to prospective cohort studies.

d   Heterogeneity in the between studies analysis was low I^2=28.5%.

e   No publication bias detected in systematic review but only searched one database.

f   High heterogeneity was detected ($I2 = 76.4\%$). Sensitivity analyses conducted and heterogeneity explored.

g   Included studies at unknown risk of bias but limited to prospective cohort studies only.

h   Included studies at unknown risk of bias.

i   Moderate heterogeneity was detected.

j   Outcome indirectness due to combining of outcome from both incidence (hospitalisation) and/or mortality.

k   Included studies at unknown risk of bias.

l   Considerable heterogeneity was detected and insufficiently explored.

Question 2: What is the relationship between consuming alcohol and heart health outcomes for people with hypertension or established CVD[1]?

Bibliography: Cochrane Review, Effect of Alcohol on Blood Pressure (4)

№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Total № of people	Mean difference (95% CI)	Certainty	Importance
			Certainty assessment					**Effect**		
Effect of high dose alcohol on systolic blood pressure compared to a placebo after ≤6 hours										
16	Randomised trials	Serious[a]	Not serious	Not serious	Not serious		418	-3.5 mmHg (-6 to -0.5)	⊕⊕⊕ MODERATE	CRITICAL
Effect of high dose alcohol on systolic blood pressure compared to a placebo after ≥13 hours										
4	Randomised trials	Serious[a]	Not serious	Not serious	Not serious		154	3.7 mmHg (2.3 to 5)	⊕⊕⊕ MODERATE	CRITICAL
Effect of high dose alcohol on diastolic blood pressure compared to a placebo **≤6 hours**										
14	Randomised trials	Serious[a,b]	Not serious	Not serious	Not serious		350	-1.9 mmHg (-3.9 to 0.04)	⊕⊕ LOW	CRITICAL
Effect of high dose alcohol on diastolic blood pressure compared to a placebo **≥13 hours**										
4	Randomised trials	Serious[a]	Not serious	Not serious	Not serious		154	1.4mmHg (0.3 to 4.5)	⊕⊕⊕ MODERATE	CRITICAL

a   Unclear risk of selection bias and attrition bias in more than one study.
b   95% confidence interval around the best effect estimate includes both negligible effect and appreciable benefit.

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