Mortality wholly attributable to Alcohol

This surveillance report presents information on deaths in Aotearoa New Zealand, where the underlying cause of death is a condition wholly caused by alcohol. The data is drawn from the New Zealand Mortality Collection (2001-2021). The timing of mortality data releases is dependent on the availability of coronial findings.

Key facts

- The number of deaths where the underlying cause is wholly attributable to alcohol has increased from 138 in 2000 to 291 in 2021.
- There was a significant increase in the male mortality rate between 2020 and 2021 driven by deaths caused by alcoholic cirrhosis of the liver.
- The group with the highest death rates is men over 65 years old. Their rate is five times higher than women over 65 years old.
- The highest age standardised rates of mortality were for Māori and European/other ethnic groups.
- Age standardised rates of mortality were statistically signficantly higher, for both men and women, in more deprived areas compared to less deprived areas.
- Men have statistically significantly lower mortality rates in rural compared to urban areas.

The health impact of alcohol

Alcohol consumption has been linked to more than 200 conditions including liver diseases, road injuries, violence, cancers, cardiovascular diseases, suicides, tuberculosis, and HIV/AIDS (World Health Organization 2018).

Although there is some evidence that low levels of alcohol consumption can have a protective effect on ischemic heart disease and type 2 diabetes, there is no threshold level of consumption below which there is no elevated risk of cancer or other alcohol related condition. The World Health Organisation view is that there is no safe level of alcohol consumption (Anderson et al. 2023; Jayasekara et al. 2014).

A number of health conditions are defined as being **wholly** caused by alcohol (that is 100%). These are listed in the annex with their codes in the International Classification of Disease version 10, Australian Modification (ICD-10-AM).

This document reports on the number and rates of mortality from these wholly attributable causes as recorded in the New Zealand Mortality Collection. This will be an underestimate of the role of alcohol in total mortality as:

- there are many conditions in which alcohol is a contributory, rather than a wholly causal, factor, so deaths from these causes are only partially attributable to alcohol (Chambers et al. 2024).
- alcohol consumption causes harm to those other than the drinker. This includes damage to the developing fetus through alcohol as well as assaults, road traffic accidents and so on (Casswell et al. 2024; Romeo et al. 2023).
- alcohol use disorders have a stigma and a doctor may omit alcohol involvement from the death certificate aware of the effect of this on other family members. Alternatively the certifying doctor may not know about the patient's history of alcohol consumption.

Recent statistically significant increase in deaths wholly attributable to alcohol

The chart below shows the age-standardised rate of mortality wholly attributable to alcohol since 2001. The male rate trended downwards from about 2005 until 2016 after which it started to increase. In 2020 there was a large statistically significant increase in the rate for men from an age standardised rate of 4.2 per 100,000 in 2020 (95% CI 3.6–5.0) to a rate of 6.4 per 100,000 in 2021 (95% CI 5.5–7.3). For women the trend is stable.

Figure 1: Mortality wholly attributable to alcohol, by sex, 2001–21 (age standardised rate per 100,000)

Notes: 95% confidence intervals have been presented as vertical bars
Source: New Zealand Mortality Collection

The age standardised rate for males is much higher than that for females with a standardised rate ratio (SRR) of 2.2 (95% CI 1.6–2.9) in 2020 and 3.2 (95% CI 2.6–4.2) in 2021.

Most deaths are caused by the effect of alcohol on the liver

In the 2017-21 period there were 1,104 deaths from causes wholly attributable to alcohol. The majority of these deaths were due to the effect of alcohol on the liver. As quoted in Osna et al. (2017) “excessive drinking over decades damages nearly every organ in the body. However, the liver sustains the earliest and the greatest degree of tissue injury from excessive drinking because it is the primary site of ethanol metabolism.” Almost 50% of these deaths (519) were due to K70.3 or *alcoholic liver cirrhosis*. A further 86 were classed as being caused by K70.4 - *alcohol fatty liver*, and 43 were caused by K70.9 *alcoholic liver disease unspecified*. Approximately 100 deaths were caused by accidental poisoning by alcohol (X45) and 90 by alcoholic cardiomyopathy I42.6.

Table 1 reports the number of deaths by the major wholly attributable causes in the last 3 years of data. The number of fatalities caused by alcoholic liver cirrhosis almost doubled between 2019 and 2021.

Table 1: Mortality wholly attributable to alcohol, by ICD 10 condition, 2019–21

ICD 10	Description	2019	2020	2021
F10.1	Mental and behavioural disorders due to use of alcohol: Harmful use	4	3	6
F10.2	Mental and behavioural disorders due to use of alcohol: Dependence syndrome	16	14	22
F10.6	Mental and behavioural disorders due to use of alcohol: Amnesic syndrome	1	3	2
F10.7	Mental and behavioural disorders due to use of alcohol: Residual and late-onset psychotic disorder	12	8	11
G31.2	Degeneration of nervous system due to alcohol	0	0	1
I42.6	Alcoholic cardiomyopathy	20	12	23
K29.2	Alcoholic gastritis	1	4	0
K70.0	Alcoholic fatty liver	11	8	9
K70.1	Alcoholic hepatitis	5	9	6
K70.2	Alcoholic fibrosis and sclerosis of liver	1	1	0
K70.3	Alcoholic cirrhosis of liver	85	96	158
K70.4	Alcoholic hepatic failure	20	19	21
K70.9	Alcoholic liver disease, unspecified	12	12	6
K85.2	Alcohol-induced acute pancreatitis	2	7	6
K86.0	Alcohol-induced chronic pancreatitis	2	2	5
X45	Accidental poisoning by and exposure to alcohol	24	18	15

Notes: These are counts of the "underlying cause of death" recorded on the death certificate and coded using the International Classification of Disease, 10th Revision, Australian Modification (ICD-10-AM). These codes are from Jones and Bellis (2013) and Carr et al. (2026)

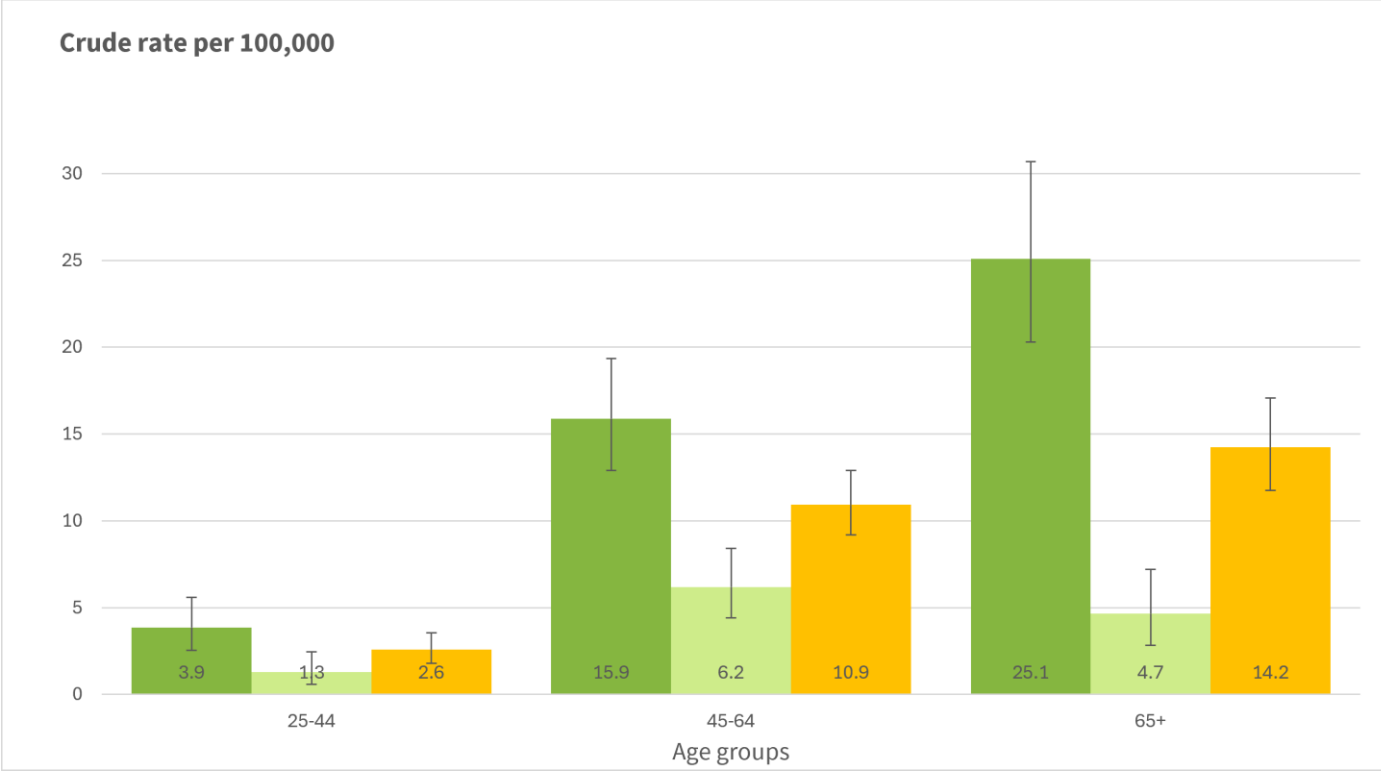
Notes: Conditions that are classified as wholly attributable to alcohol but had zero mortality in 2019-21 are not included here. A full list is in the annex

Source: New Zealand Mortality Collection

The highest mortality rates were among 65+ year old males.

There were no deaths in the age groups below 25 years old in 2021. Crude death rates from conditions wholly caused by alcohol were highest in the 65+ year old group.

Figure 2: Mortality wholly attributable to alcohol, by age group, 2019–2021 (crude rate per 100,000)

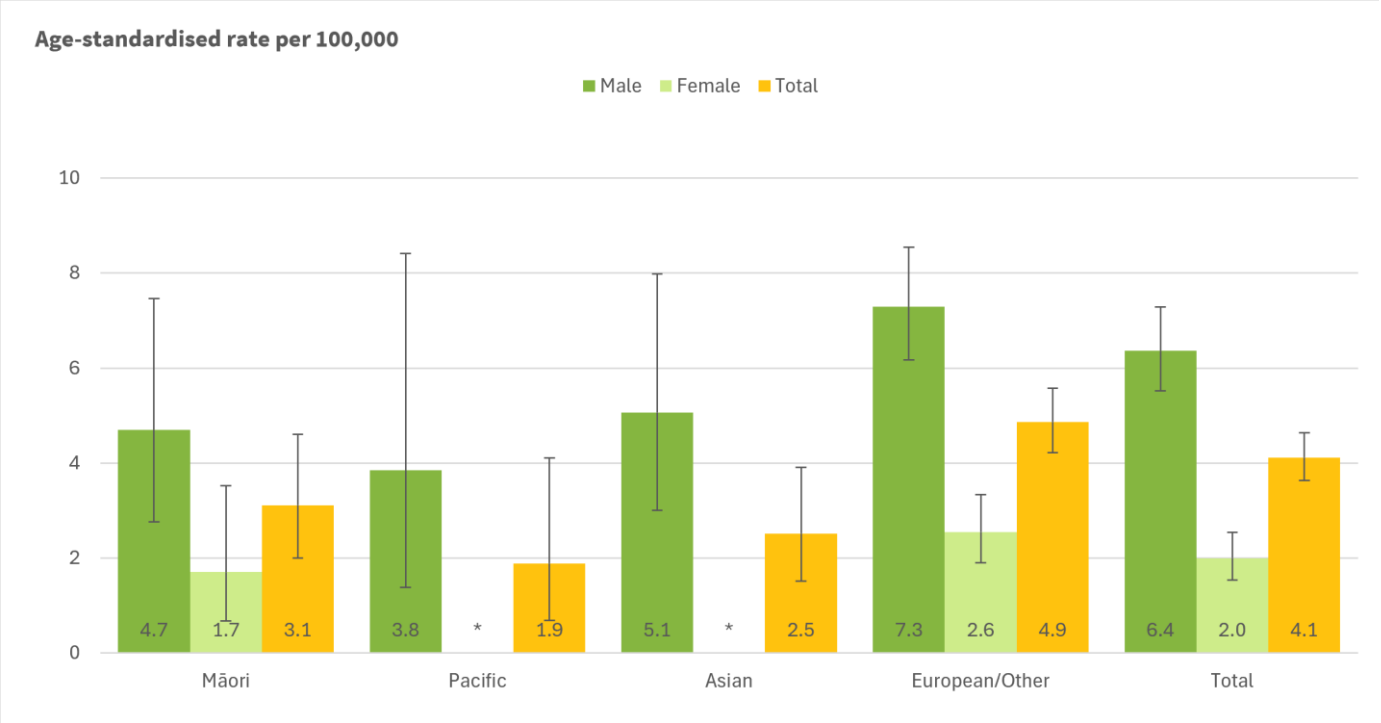


Notes: 95% confidence intervals have been presented as vertical bars
Source: New Zealand Mortality Collection

No significant difference between male mortality rates by ethnic group

The European/Other group has the highest rate of mortality from alcohol. However, because of wide confidence intervals for these estimates, the differences between the male rates across ethnic groups are not statistically significant. Similarly, the difference in the rates between European/Other and Māori women is not statistically significant. For Pacific and Asian women, the counts are too low to estimate a rate.

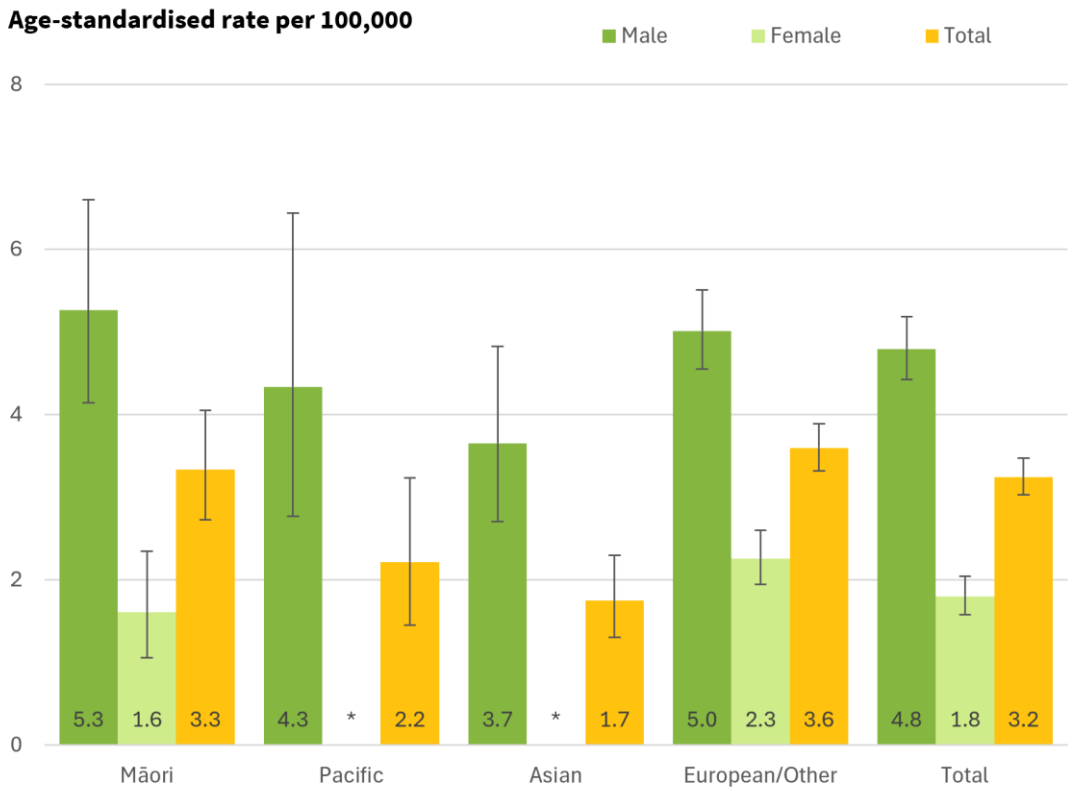
Figure 3: **Mortality wholly attributable to alcohol, by ethnic group (prioritised), 2021 (age standardised rate per 100,000)**



Notes: Rates are suppressed when counts are fewer than 20. This is indicated by *.
Notes: 95% confidence intervals have been presented as vertical bars
Source: New Zealand Mortality Collection

The following chart shows the rates measured over the four-year period 2018–2021. Even over this longer period the rates for the male ethnic groups are not significantly different. For Pacific and Asian women, the numbers are too low to report any rate.

Figure 4: **Mortality wholly attributable to alcohol, by ethnic group, 2018–2021 (age-standardised rate per 100,000)**

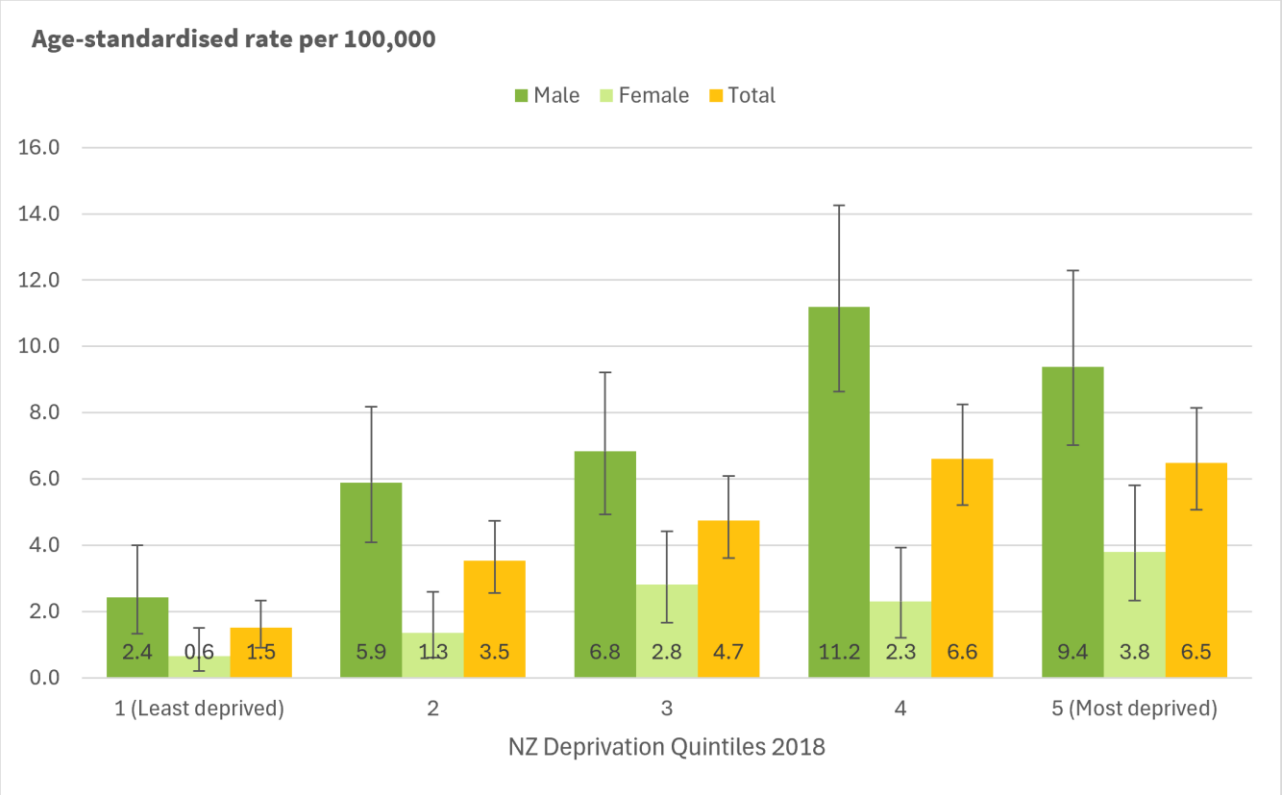


Notes: 95% confidence intervals have been presented as vertical bars
Notes: an asterisk '*' indicates that the count is below 20 and therefore the rate has been suppressed.
Source: New Zealand Mortality Collection.

People living in more socioeconomically deprived areas have higher rates of mortality

Mortality rates from alcohol in the most socioeconomically deprived areas are higher than those in the least deprived areas. The standardised rate ratio for men between deprivation quintile 5 (most deprived) and deprivation quintile 1 (least deprived) is 3.88 (95% CI 2.17-6.94) and for women the figure is 5.89 (95% CI 2.21-15.73).

Figure 5: **Mortality wholly attributable to alcohol 2021, by NZDEP18 (age standardised rate per 100,000)**

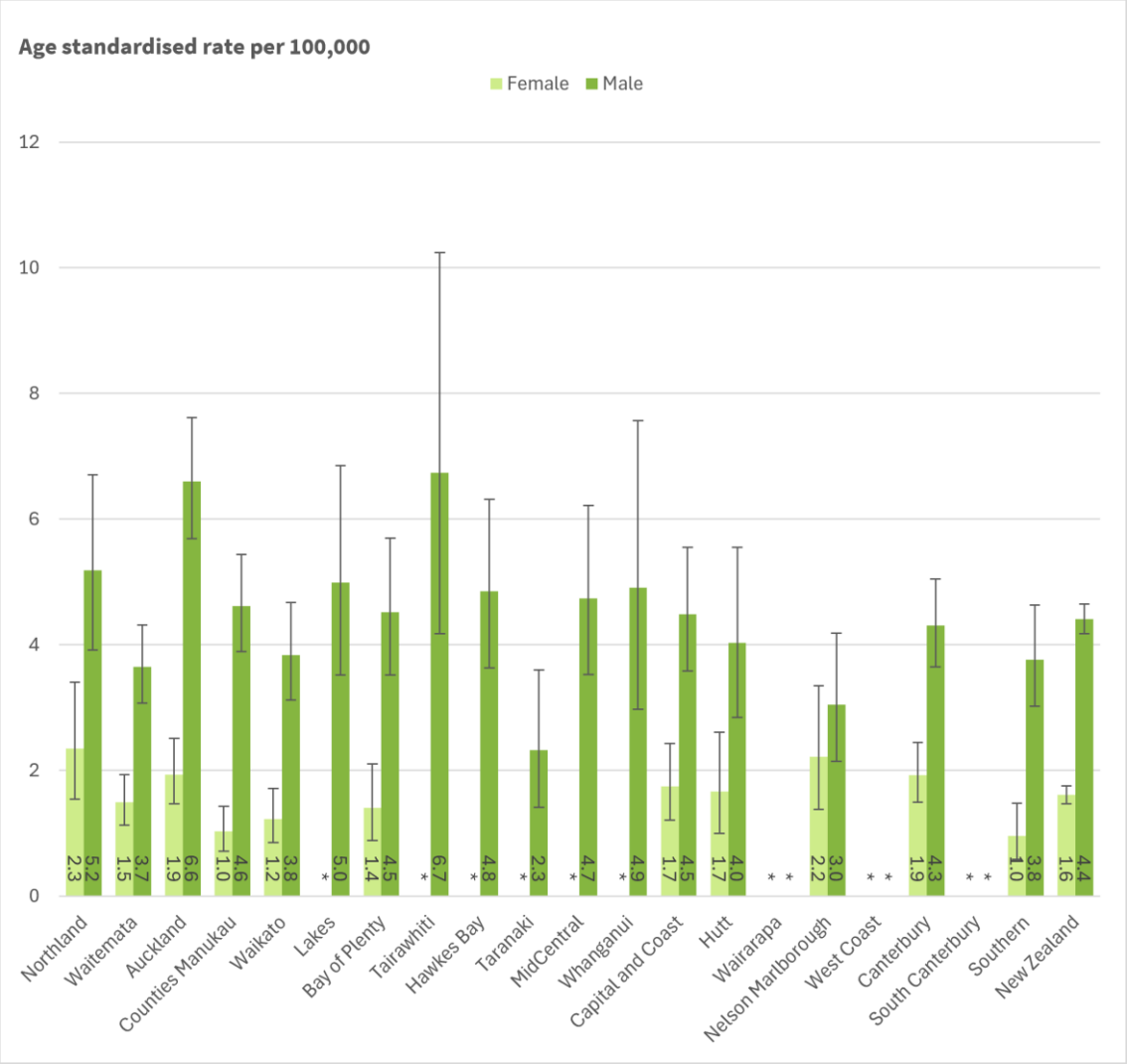


Notes: 95% confidence intervals have been presented as vertical bars
Source: New Zealand Mortality Collection.

Significantly higher rates of mortality in Auckland

Data at health district level is only informative when looked at over a long period as, in many districts the numbers are too low to calculate rates with any precision. In Figure 6 the rates are given over the last ten years of data. Waitematā, Taranaki and Southern have age-standardised rates of mortality wholly attributable to alcohol significantly below the national average and Auckland has rates significantly above the national average.

Figure 6: Mortality wholly attributable to alcohol, by health district 2012-2021 (age standardised rate per 100,000)



Notes: 95% confidence intervals have been presented as vertical bars.
Notes: an asterisk '*' indicates that the count is below 20 and therefore the rate has been suppressed.
Source: New Zealand Mortality Collection

Male mortality rates significantly lower in rural areas

The rate of mortality wholly attributable to alcohol was significantly lower for men in rural when compared to urban areas. The standardised rate ratio based on 2021 Mortality data was 0.6 (CI 0.4-1.0). For women the difference was not significant.

Discussion

The majority of alcohol related deaths measured are from the effects of alcohol on the liver, particularly liver cirrhosis. There appears to have been an increase in the number of deaths in 2021 at the end of our data series. This trend in alcohol liver disease mortality has also been seen in England (Public Health England 2021) and the United States (Brooks 2025; Chiung M. Chen and Hillel R. Alpert 2025). It has been suggested that the COVID-19 pandemic may have accelerated the long-term trend in alcoholic liver disease.

The link between alcohol consumption and mortality is complex. The level of consumption at which the risk of dying increases differs by gender, age, genetic disposition, comorbidities and whether the alcohol is consumed more harmfully. Men have much higher rates of mortality than women across all age groups, ethnicities, deprivation indicators and health districts. This is even though a woman's health suffers from alcohol at lower consumption levels than men (McCaul et al. 2019). The higher rates of mortality among men is because men are more likely to drink than women and much more likely to drink hazardously (Ministry of Health 2024).

There is a strong social and economic gradient in the mortality risk of alcohol as shown in Figure 5. This has been called the 'alcohol harm paradox' because alcohol consumption is often lower in lower SES groups, but the mortality rate is much higher. Currently there is no accepted theory to explain this, although many possible causal pathways remain to be researched (Boyd et al. 2022).

Data for this indicator

The mortality numbers reported here are for deaths where the underlying cause is a condition wholly attributable to alcohol. Deaths where alcohol consumption is a contributory factor are not included. Our measures are therefore an underestimate of the total burden of disease resulting from alcohol. This indicator does not cover deaths caused by other's drinking such as through drunk driving or violent assault.

Data for this indicator comes from the Mortality Collection maintained and published by the Ministry of Health and Health New Zealand (Te Whatu Ora). A metadata factsheet with full details of sources and methods is available.

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Annex

List of ICD-10-AM codes for conditions wholly attributable to alcohol

ICD 10	Description
E24.4	Alcohol-induced pseudo-Cushing's syndrome
F10.0	Mental and behavioural disorders due to use of alcohol, acute intoxication
F10.1	Mental and behavioural disorders due to use of alcohol, harmful use
F10.2	Mental and behavioural disorders due to use of alcohol, dependence syndrome
F10.3	Mental and behavioural disorders due to use of alcohol, withdrawal state
F10.4	Mental and behavioural disorders due to use of alcohol, withdrawal state with delirium
G31.2	Degeneration of nervous system due to alcohol
G62.1	Alcoholic polyneuropathy
G72.1	Alcoholic myopathy
I42.6	Alcoholic cardiomyopathy
K29.2	Alcoholic gastritis (K29.20 – without bleeding, K29.21 – with bleeding)
K70.1	Alcoholic hepatitis
K70.3	Alcoholic cirrhosis of liver
K70.4	Alcoholic hepatic failure
K85.2	Alcohol-induced acute pancreatitis
K86.0	Alcohol-induced chronic pancreatitis
T51.0	Ethanol poisoning
T51.1	Methanol poisoning
T51.9	Toxic effect of alcohol, unspecified
X45	Accidental poisoning by and exposure to alcohol
X65	Intentional self-poisoning by and exposure to alcohol
Y15	Poisoning by and exposure to alcohol, undetermined intent
K85.2	Alcohol-induced acute pancreatitis
Q86.0	Foetal alcohol syndrome (dysmorphic)
R78.0	Excess alcohol blood levels
Y90	Evidence of alcohol involvement determined by blood alcohol level
Y91	Evidence of alcohol involvement determined by level of intoxication

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