

Alcohol-specific deaths: Methodology

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How are alcohol-specific deaths calculated?

The number of deaths that may be due to alcohol can be calculated in various ways, using definitions which range from a 'narrow' one (which counts only those deaths which are wholly specific to alcohol – e.g. from alcoholic liver disease) to a 'wide' one (which includes deaths which may be only partially attributable to alcohol – e.g. from certain types of cancer). This section provides information on the number of deaths which are counted as being due to alcohol, on the basis of two National Statistics (NS) definitions (which may be referred to as the 'new' one and the 'old' one). Some causes of death are counted by both definitions; others are counted by one definition but not by the other.

First, the new NS definition, which produces what may be described as the number of **'alcohol-specific'** deaths. These are deaths which are known to be direct consequences of alcohol misuse, meaning they are wholly attributable to alcohol misuse. Such figures were first published in 2017, using a definition which was introduced following a consultation organised by the Office for National Statistics (ONS), more information about which is given below. Because of the way in which they are defined, figures on this basis were at first available only for the years from 2000. However, on 16 October 2018, following work by NHS Health Scotland, National Records of Scotland (NRS) extended the series available on this website back to 1979.

Second, the old NS definition, which produces what was described as the number of **'alcohol-related'** deaths. These are deaths from a selection of causes which are related to alcohol consumption. Most of those causes are wholly attributable to alcohol misuse (i.e. medical conditions for which every death is caused by alcohol), but some are only partially attributable to alcohol misuse (i.e. medical conditions for which only a proportion of deaths are caused by alcohol). This definition was introduced in 2006, and figures on this basis are available back to 1979.

The numbers produced using the two NS definitions show broadly similar patterns of change over the period from 2000 to 2016, with the new definition's figures for Scotland tending to be very roughly 10% lower (the difference is between about 7% and around 12%, depending upon the year concerned), as can be seen from the chart which is available on the [Alcohol Deaths landing page](#). (Pre-2000, the two definitions' figures appear to differ more, but still show broadly similar long-term trends.)

It is expected that, henceforth, much more use will be made of the alcohol-specific death figures than of the alcohol-related death figures. However, NRS will continue to update the figures which are based on the old definition for at least a few years, for the benefit of those users of its statistics who wish to continue using them.

Figures use the underlying cause of death

A range of information is available from the death certificate, and figures for deaths from a particular cause can be produced in a number of ways: more on such points

is available via the ['Death Certificates and Coding the Causes of Death'](#) page of the National Records of Scotland (NRS) website.

The figures for alcohol deaths (using both the old and the new definitions) are produced on the 'underlying cause' basis, so they are the numbers of deaths for which the disease or injury which initiated the chain of morbid events leading directly to death was one of those which are listed in the relevant definition.

Causes of death which are not covered by the National Statistics (NS) definitions

The figures for alcohol deaths do not include all deaths which may be caused by alcohol - for example, they do not include deaths:

- as a result of road accidents, falls, fires, suicide or violence involving people who had been drinking; or
- from some medical conditions which are considered partly attributable to alcohol, such as certain forms of cancer.

The reasons for this include the need to be able to provide reasonably consistent trends over time and for different parts of the United Kingdom (UK). The NS definitions used include only those causes of death which are regarded as being most directly due to alcohol consumption and for which figures can be obtained from the statistics of registered deaths, due to lack of consistent statistical information about (e.g.) accidental deaths, suicides and homicides which are directly due to the consumption of alcohol.

Including appropriate proportions of deaths from causes such as road accidents and certain forms of cancer would produce considerably higher figures for alcohol-related deaths. Further information about this is available from (e.g.) the Information Services Division (ISD) Scotland paper ['Alcohol attributable mortality and morbidity: alcohol population attributable fractions for Scotland'](#), which was published in June 2009, and the Scottish Public Health Observatory (ScotPHO) report ['Hospital admissions, deaths and overall burden of disease attributable to alcohol consumption in Scotland'](#), which was published in February 2018.

Moving averages and likely ranges of year-to-year statistical variability

The charts that are included with the tables show that the number of alcohol deaths (using either definition) registered in Scotland may fluctuate noticeably from one year to the next. Therefore, in addition, the charts provide 5-year moving average values, which should be a better guide to the underlying level of such deaths and any longterm trend. The charts also show the likely range of values around the moving average. This likely range of statistical variability in the figures is estimated by assuming that the numbers represent the outcome of a Poisson process, with the underlying rate of occurrence in each year being the same as the value of the 5-year moving average which is centred on that year. 'Upper' and 'lower' boundaries of an approximate '95% confidence interval' around the moving average are calculated by adding/subtracting twice the standard deviation (for a Poisson distribution, the mean and the variance are the same, so the standard deviation is simply the square root of

the moving average). In the case of alcohol-related deaths (i.e. the old NS definition), in the period from 1981 to 2014 (inclusive), only two of the 34 years had figures which were outwith this range - and this is broadly in line with what one would predict based on statistical theory (as only about 5% of observations would be expected to fall outwith an approximate 95% confidence interval).

The numbers of alcohol deaths for areas within Scotland may be subject to large percentage year-to-year fluctuations. Therefore, the tables give 5-year moving averages as well as figures for individual years for (e.g.) NHS Board areas, as the moving averages should provide a better guide to the underlying level, and any longterm trend, than the figure for any given year, or the change between one year and the next.

A separate section of the NRS website provides more information about [fluctuations in and possible unreliability of death statistics for small areas, for small sub-groups of the population, or for short periods](#).

The introduction of the new NS definition: alcohol-specific deaths

In Spring 2017, the Office for National Statistics (ONS) initiated discussions with NRS, Scottish Government, ISD and some other government bodies regarding the need to review the NS definition of alcohol-related deaths that ONS, NRS and others used to produce statistics. This led to ONS consulting a range of interested parties on the NS definition of alcohol deaths that should be used in future. The relevant documents, which were all prepared by ONS (with input from NRS and others, who contributed as appropriate when necessary), are as follows:

- [‘Alcohol mortality definition review’](#) (published 28 June 2017) – the consultation document
- [‘Response to consultation on the National Statistics definition of alcohol-related deaths’](#) (published 6 October 2017) – summarised the responses to the consultation and set out what would be done in consequence
- [‘The impact of using the new definition of alcohol-specific deaths’](#) (published 27 October 2017) – compared the numbers of deaths counted by the old and the new definitions, and the resulting age-standardised death rates, for the UK as a whole and for each of its four countries. It also provided several time-series of figures, on the basis of the new definition, for 2001 to 2015. Table 1 of this publication compares the causes of death which are covered by the two definitions.
- [‘Alcohol-specific deaths in the UK: registered in 2016’](#) (published 7 November 2017) – the first edition of ONS’s annual ‘alcohol deaths’ publication to use the new definition, it included comparisons of the age-standardised death rates for each sex for the four countries of the UK.

Definition of alcohol-specific deaths

Deaths are coded according to the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10), which has been used by National Records of Scotland (NRS) since the start of 2000.

NB: at first, figures on this basis were not available for 1999 or earlier years, because there are no exact equivalents of some of these codes in the International Statistical Classification of Diseases and Related Health Problems, Ninth Revision (ICD-9), which NRS used from 1979 to 1999. However, in June 2018, NHS Health Scotland published a series of alcohol-specific death rates going back to 1981, which it produced using what it felt was a broadly comparable set of ICD-9 codes, in the 'Monitoring and Evaluating Scotland's Alcohol Strategy (MESAS) monitoring report 2018. NRS subsequently used its data for 1999, which had been 'bridge coded' using both ICD-9 and ICD-10 (see Appendix 2 of the Registrar General's Annual Report for 2000) to assess the compatibility of NHS Health Scotland's choice of ICD9 codes with the ICD-10 codes used in the National Statistics definition. NRS found that the figure for 1999 produced using the ICD-10 codes was the larger, but only by 0.9%, so statistics of alcohol-specific deaths would have a very small break in series between 1999 and 2000. NRS therefore used the ICD-9 codes listed below to produce its figures for alcohol-specific deaths for 1979 to 1999.

Causes of death wholly specific to alcohol consumption, 2000 onwards

ICD-10 Code	Description
E24.4	Alcohol-induced pseudo-Cushing's syndrome
F10	Mental and behavioural disorders due to use of alcohol
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
K70	Alcoholic liver disease
K85.2	Alcohol-induced acute pancreatitis
K86.0	Alcohol induced chronic pancreatitis
Q86.0	Fetal induced alcohol syndrome (dysmorphic)
R78.0	Excess alcohol blood levels
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

Causes of death wholly specific to alcohol consumption, 1979 to 1999

The codes for alcohol-specific deaths that are listed below are the same as those that were used by NHS Health Scotland, with one exception: ICD-9 code 760.7 “Noxious influences transmitted via placenta or breast milk” is omitted, as it would be used if other types of substance (such as medicines and drugs) were taken by the mother, and there is no evidence that, in most of the cases for which it was used, the noxious influence was alcohol.

ICD-9 Code	Description
291	Alcoholic psychoses
303	Alcohol dependence syndrome
305.0	Nondependent abuse of alcohol
357.5	Alcoholic polyneuropathy
425.5	Alcoholic cardiomyopathy
535.3	Alcoholic gastritis
571.0	Alcoholic fatty liver
571.1	Acute alcoholic hepatitis
571.2	Alcoholic cirrhosis of liver
571.3	Alcoholic liver damage, unspecified
790.3	Excessive blood level of alcohol
E860	Accidental poisoning by alcohol

Definition of alcohol-related deaths

Deaths are coded according to the International Statistical Classification of Diseases and Related Health Problems, Ninth Revision (ICD-9) and Tenth Revision (ICD-10).

In July 2018, National Records of Scotland (NRS) used its data for 1999, which had been 'bridge coded' using both ICD-9 and ICD-10 (see Appendix 2 of the Registrar General's Annual Report for 2000) to assess the compatibility of these definitions. NRS found that using the ICD-10 codes gave a figure for 1999 that was 3.6% lower than the published number (which had been produced using the ICD-9 codes) – so, strictly speaking, the statistics of alcohol-related deaths have a small break in the series between 1999 and 2000. However, NRS has not modified the tables to reflect this, because the figures for the years up to 1999 and from 2000 have appeared as they are for many years, and it seems unlikely that making any changes at such a late stage would be of any benefit (especially as it is expected that much more use will be made of the statistics of alcohol-specific deaths than of alcohol-related deaths).

Causes of death related to alcohol consumption, (old National Statistics definition)
2000 onwards

ICD-10 Code	Description
F10	Mental and behavioural disorders due to use of alcohol
G31.2	Degeneration of nervous system due to alcohol
G62.1	Alcoholic polyneuropathy
I42.6	Alcoholic cardiomyopathy
K29.2	Alcoholic gastritis
K70	Alcoholic liver disease
K73	Chronic hepatitis, not elsewhere classified
K74.0	Hepatic fibrosis
K74.1	Hepatic sclerosis
K74.2	Hepatic fibrosis with hepatitic sclerosis
K74.6	Other and unspecified cirrhosis of liver
K86.0	Alcohol induced chronic pancreatitis
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

Causes of death related to alcohol consumption, (old National Statistics definition) 1979-1999

ICD-9 Code	Description
291	Alcoholic psychoses
303	Alcohol dependence syndrome
305.0	Non-dependent abuse of alcohol
425.5	Alcoholic cardiomyopathy
571.0	Alcoholic fatty liver
571.1	Acute alcoholic hepatitis

571.2	Alcoholic cirrhosis of liver
571.3	Alcoholic liver damage, unspecified
571.4	Chronic hepatitis
571.5	Cirrhosis of liver without mention of alcohol
571.8	Other chronic nonalcoholic liver disease
571.9	Unspecified chronic liver disease without mention of alcohol
E860	Accidental poisoning by alcohol