

Main Points

Background

The concept of 'avoidable mortality' was designed to highlight areas of potential weakness in healthcare that could benefit from further investigation: where there are many premature deaths caused by conditions for which effective public health and medical interventions are available. Ideally, such deaths should not occur given timely and effective healthcare. However, the results must be interpreted cautiously, and are not intended for use to assess possible differences in the effectiveness of healthcare systems.

These figures were produced using a definition of 'avoidable' mortality which was developed by the Office for National Statistics (ONS). Refer to the [Methodology paper](#) for further information. This definition counts as 'avoidable' deaths from those causes for which all or most such deaths (subject to age limits if appropriate) are considered potentially avoidable through public health interventions or timely and effective healthcare. It should be noted that not every death from those causes could be avoided.

This web section has been improved by adding two new tables. These provide, for each 'decile' of the Scottish Index of Multiple Deprivation:

- time-series of the number and percentage of deaths which were 'avoidable' (Table 10); and
- 'age-standardised' death rates from 'avoidable', 'preventable' and 'amenable' (to treatment) causes of death (Table 11).

Key points

Slightly over a quarter of all deaths registered in Scotland are counted as (potentially) avoidable for the purpose of these statistics. [Table 1](#) shows that in 2018, there were 58,503 deaths registered in Scotland, of which 16,117 (28%) were counted as 'avoidable': more-or-less the same percentage as in each of the previous four years. There are no figures for the years before 2014 because that is the first year for the current ONS definition (for more on this, refer to the [Methodology paper](#)).

Around a third of all male deaths are counted as 'avoidable': 9,513 out of 28,642 (33%) in 2018, compared with a little over a fifth of female deaths (6,604 out of 29,861 or 22%). The difference between the sexes arises because the definition counts as 'avoidable' only a small proportion of deaths aged 75 or older. On average, women live longer than men, so a larger percentage of women die aged 75 or older, and hence a smaller proportion of female deaths is counted as 'avoidable' (for the purpose of these statistics).

'Preventable' and 'amenable' (to treatment) causes of death

The ONS definition of 'avoidable' mortality covers deaths from two types of cause. First, those which are counted as 'preventable', because all or most deaths from

those causes (subject to age limits if appropriate) could be avoided by public health interventions. Second, those which are counted as 'amenable' (to treatment), because all or most deaths from those causes (subject to age limits if appropriate) could be avoided by good quality healthcare. Some causes of death are counted as both 'preventable' and 'amenable'. More information about this is available in the [Methodology paper](#).

Table 1 shows that (in terms of the definitions used for these statistics), of the deaths that were registered in 2018:

- 8,077 were counted as 'preventable' but not 'amenable';
- 2,259 were counted as 'amenable' but not 'preventable'; and
- 5,781 were counted as both 'preventable' and 'amenable'.

In consequence:

- 13,858 deaths (24% of all the deaths that were registered in the year) were 'preventable' (some of which were also 'amenable' to treatment); and
- 8,040 deaths (14% of all deaths) were 'amenable' (some of which were also 'preventable').

From the figures in Table 1, it can be seen that roughly half of all 'avoidable' deaths were counted as 'preventable' but not 'amenable', around a sixth were counted as 'amenable' but not 'preventable' and just over a third were counted as both 'preventable' and 'amenable'. It follows that, in terms of the definitions that are used for these statistics, around five-sixths of all 'avoidable' deaths are 'preventable', and roughly half are 'amenable' (to treatment).

The main causes of (potentially) avoidable deaths

The ONS document which defines 'avoidable' mortality lists all the causes of death that are counted as 'preventable' and/or 'amenable'. In most cases, it specifies that only deaths in a particular age-range (for example 0 to 74 years) should be counted as 'avoidable', for the purpose of these statistics. [Table 2](#) shows the underlying causes of deaths registered in Scotland in 2018, in terms of the chapters of the World Health Organisation's International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10), in total and for each sex. The first column of Table 2 shows that, on that basis, the main causes of the deaths that were registered in 2018 were:

- neoplasms (mainly cancer) – 16,575 (28% of the total of 58,503 deaths from all causes);
- circulatory system diseases (for example ischaemic/coronary heart disease and cerebrovascular diseases, such as strokes) – 14,823 (25% of deaths from all causes);
- respiratory system diseases (for example pneumonia and chronic obstructive pulmonary disease) – 7,128 (12% of deaths from all causes); and
- mental and behavioural disorders (for example dementia) – 4,569 (8% of deaths from all causes).

Together, those four ICD-10 chapters accounted for almost three-quarters of all the deaths that were registered in Scotland. The second column of Table 2 shows that many of the 'avoidable' deaths registered in 2018 were caused by:

- neoplasms – 5,090 (32% of the total of 16,117 'avoidable' deaths);
- circulatory system diseases - 3,830 (24% of all the 'avoidable' deaths);
- respiratory system diseases - 1,531 (9% of all the 'avoidable' deaths);

but relatively few were due to mental and behavioural disorders - 348 (2% of all the 'avoidable' deaths) - because most of that ICD-10 chapter's causes of death are not counted as 'avoidable' for the purpose of these statistics.

From the percentages that are given in Table 2, it is clear that the proportion of all deaths that are counted as 'avoidable' varies greatly between the ICD-10 chapters. For example:

- almost all of the deaths which were due to 'external causes' (for example accidents, intentional self-harm) are counted as 'avoidable'; whereas
- under a tenth of the deaths which were due to mental and behavioural disorders are counted as 'avoidable'.

Table 2 also shows that there are differences between the ICD-10 chapters in the extent to which 'avoidable' deaths are 'preventable' or 'amenable' or both. For example:

- almost all the 'avoidable' deaths from external causes are counted as 'preventable' but not 'amenable'; whereas
- only a small proportion of the 'avoidable' deaths from circulatory system diseases are counted as 'preventable' but not 'amenable'.

(Potentially) avoidable deaths of each sex by age-group, by NHS Board and by council

[Table 3](#) shows recent years' numbers of deaths for each age-group, and how many of them were counted as 'avoidable' for the purpose of these statistics. It will be seen that only small proportions of deaths of those aged 75 or older are counted as 'avoidable', compared to well over half of all deaths in each of the younger age-groups (with the possible exception of some age-groups which each have relatively few deaths). Note that there may be some large percentage year-to-year fluctuations when the numbers are relatively small (due simply to the inevitable variability of natural events – refer to the [Fluctuations in and possible unreliability of death statistics](#) section): for example, the number of deaths of 20-24 year olds that was counted as 'avoidable' was 146 in 2018, compared with 115 in 2017, 130 in 2016, 102 in 2015 and 138 in 2014. As a result, an average of the figures for all the years for which they are available may be a more reliable indication of the level of 'avoidable' deaths in a particular age-group than the figure for any one of those years.

[Table 4](#) and [Table 5](#) provide the corresponding figures for individual NHS Board and council areas. Again, there may be some large percentage year-to-year fluctuations

when the numbers are relatively small, and so an annual average may be a better indication of the level for an area than the figure for any one of the years. As would be expected (given that the definition counts as 'avoidable' only a small proportion of deaths aged 75 or over), among the areas with the larger populations, the ones with higher percentages of their deaths that are counted as 'avoidable' tend to be the ones with the highest age-standardised death rates for under 75s (figures which can be found via the [Age-standardised Death Rates Calculated Using the European Standard Population](#) section).

(Potentially) avoidable, preventable and amenable (to treatment) deaths of each sex, cross - classified by cause and age-group

[Table 6](#), [Table 7](#) and [Table 8](#) give the latest year's numbers of 'avoidable', 'preventable' and 'amenable' (respectively) deaths, cross-classified by cause of death (ICD-10 chapters) and age at death, in total and for each sex. As each table is for a single year, it cannot show the year-to-year variation in the figures, but it should be kept in mind that relatively small numbers may be subject to large percentage year-to-year fluctuations. These tables do not show the ICD-10 chapters for which there were no such deaths. In terms of the ICD-10 chapters, in the age-groups which account for most of the 'avoidable' deaths (which are those from 50-54 to 70-74, inclusive), neoplasms were the biggest single cause of 'avoidable' deaths and of 'preventable' deaths, but circulatory system diseases were the biggest single cause of 'amenable' (to treatment) deaths. However, the other age-groups (which had smaller numbers) had other biggest single causes of 'avoidable' deaths. The vast majority of 'avoidable' deaths under the age of one were caused by certain conditions originating in the perinatal period. The next three age-groups (1-4, 5-9 and 10-14) each had relatively few 'avoidable' deaths, so there is little point commenting on their causes. Finally, 'external' causes (for examples accidents, intentional self-harm) were the biggest single cause of 'avoidable' deaths aged 15 to 49, and the cause of all 'avoidable' deaths aged 75 or over.

(Potentially) avoidable deaths by sex, underlying cause of death and year, and whether they are counted as preventable, amenable (to treatment) or both

[Table 9](#) gives each year's number of 'avoidable' deaths cross-classified by cause of death (ICD-10 chapters), in total and for each sex, plus similar breakdowns of the numbers that were counted as (i) 'preventable' but not 'amenable', (ii) 'amenable' but not 'preventable' and (iii) both 'preventable' and 'amendable'. ICD-10 chapters for which there were no 'avoidable' deaths do not appear. Some ICD-10 chapters have relatively small numbers, which may be subject to large percentage year-to-year fluctuations.

The number of 'avoidable' deaths increased from 14,793 in 2014 to 16,117 in 2018. In terms of the ICD-10 chapters, the majority of the rise of 1,324 in the number of 'avoidable' deaths between 2014 and 2018 was accounted for by increases of:

- 838 in 'avoidable' deaths due to external causes, which include falls and poisoning (2014: 2,512 such deaths; 2018: 3,350 such deaths);
- 146 in 'avoidable' deaths due to respiratory system diseases (2014: 1,385 such deaths; 2018: 1,531 such deaths)

- 120 in 'avoidable' deaths due to endocrine, nutritional and metabolic diseases, like diabetes and obesity (2014: 310 such deaths; 2018: 430 such deaths); and
- 87 in 'avoidable' deaths due to circulatory system diseases, for example ischaemic heart disease and cerebrovascular diseases (2014: 3,743 such deaths; 2018: 3,830 such deaths).

The other ICD-10 chapters had either smaller increases or, in some cases, falls in their numbers of 'avoidable' deaths between 2014 and 2018.

(Potentially) avoidable deaths of each sex by year and decile of the Scottish Index of Multiple Deprivation: numbers, and age-standardised death rates for avoidable, preventable and amenable mortality

[Table 10](#) gives each year's total number of deaths, and the number that were counted as 'avoidable', broken down by sex and the deciles of the Scottish Government's (SG's) Scottish Index of Multiple Deprivation (SIMD). The SIMD is a measure of relative deprivation. SG produced the 2016 version using data in respect of 6,976 'datazones' (generally small areas, with roughly equal populations, that together cover the whole of Scotland). For each datazone, SG calculated the values of 38 indicators of various aspects of deprivation (such as income, access to services, and housing), and combined the results in order to rank the datazone from 1 (most deprived) to 6,976 (least deprived). The first decile of the SIMD is made up of the tenth of datazones which were ranked 1 to 697, the second decile consists of the next tenth (those ranked 698 to 1,395), and so on. The first decile therefore contains the most deprived 10% of datazones, and the tenth decile contains the least deprived 10% of datazones. More information about SIMD is available [here](#) .

The second row of Table 10 shows that, in 2018, the datazones which together made up the most deprived decile had a total of 6,796 deaths, of which 2,772 (41%) were counted as 'avoidable'. In contrast, nine rows down, the datazones which comprised the least deprived decile had a total of 4,406 deaths, of which 794 (18%) were 'avoidable'. There is a large difference between those two deciles' total numbers of deaths in 2018 (6,796 and 4,406), as overall death rates are markedly higher in the most deprived areas than in the least deprived areas (each decile has around a tenth of Scotland's population: for example, in 2017, the most deprived decile had 9.7%, and the least deprived had 10.5%). In addition, in 2018, for the most deprived decile, the proportion of all deaths which were 'avoidable' (41%) was more than double the corresponding figure for the least deprived decile (18%). The table also shows that both the total number of deaths and the percentage which were 'avoidable' tend to fall as one moves, from decile to decile, from the most deprived to the least deprived. In addition, between 2014 and 2018, the percentage of all deaths which were 'avoidable' rose slightly for the most deprived decile (from 38% to 41%), and fell slightly for the least deprived decile (from 20% to 18%), so the difference between those two deciles appears to have increased.

Death rates usually vary greatly with age. The distribution of the population by age may vary between the deciles, and the size and composition of the population of different deciles may change over time. As a result, analysis of the numbers given in Table 10 may not provide a complete picture of the differences between deciles and

of trends over time. Therefore, [Table 11](#) presents 'age-standardised' death rates from 'avoidable', 'preventable' and 'amenable' (to treatment) causes of death. 'Age-standardised' death rates show the underlying differences in mortality between (e.g.) areas and periods, by using a 'standard population' to remove the effects of variation in the age-distribution of the population between areas and also over time. The use of a 'standard population' means that their values are not comparable to those of the so-called 'crude' death rates (which are calculated simply by dividing the total number of deaths by the size of the population). More information about age-standardised death rates is available [here](#) .

The first column of Table 11 shows the large differences between the most deprived and least deprived deciles' numbers of 'avoidable' deaths that were revealed by Table 10. The second column presents the corresponding age-standardised rates of death from 'avoidable' causes. Again, the value for the most deprived decile is several times that for the least deprived decile (as would be expected, given that the figures in Table 10 implied that the most deprived decile had a much higher overall death rate, and showed that a much larger percentage of its deaths were 'avoidable'). For example, for males in 2014, the ratio of the age-standardised death rates of the most deprived and least deprived deciles was 4.0, which is calculated by dividing 717.7 (for the most deprived decile) by 178.7 (for the least deprived decile).

The ratio of the age-standardised death rates of the most deprived and least deprived deciles is not stable. It was:

- males - 4.0 for 2014, 4.0 for 2015, 4.5 for 2016 and 4.2 in 2017; and
- females - 3.3 for 2014, 4.3 for 2015, 3.6 for 2016 and 3.8 for 2017;

so there have sometimes been large percentage year-to-year changes in its value.

The third and fourth columns of Table 11 provide '95% confidence intervals' for the age-standardised death rates. These indicate the range of values that might be expected to arise due to 'random' year-to-year fluctuations in the number of deaths (more information about this is available [here](#)). Such fluctuations could cause the year-to-year variation in the ratio of the death rates for the most deprived and least deprived deciles.

The remainder of Table 11 provides the corresponding figures for 'preventable' and 'amenable' (to treatment) causes of death, which also show considerable differences between the deciles.