Avoidable mortality in England and Wales QMI

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2 . Executive summary

It is widely accepted that the contribution of healthcare to improvements in population health needs to be quantified. Avoidable mortality provides a measure of this contribution and is based on the concept that deaths caused by certain conditions, for which effective public health and medical interventions are available, should be rare, and ideally, should not occur.

Avoidable mortality in England and Wales presents statistics on the number of potentially avoidable deaths and corresponding age-standardised mortality rates and standardised years of life lost (SYLL). Data are broken down by sex, English region and cause of death.

Avoidable mortality in England and Wales is compiled using information supplied when a death is registered. The number of deaths where the underlying cause of death is considered to be avoidable is extracted from our Deaths Registrations Database for England and Wales using the list of causes in the definition of avoidable mortality.

Two important changes have been made to our reporting of avoidable mortality. First, we have revised our definition of avoidable mortality following a public consultation. Second, we have developed an avoidable mortality definition for children and young people. Further information about these definitions is available on the consultation page of our website.

With advances in medical technology and wider public health interventions, deaths from a condition that was previously not avoidable may have since become avoidable. This means that when the list of avoidable causes of death is updated, it may not be appropriate to reproduce previously published data using the revised avoidable mortality definition. For this reason, figures are presented for deaths registered in the latest year only. Previously published data have not been reproduced using the revised avoidable mortality definition.

This report contains the following sections:
3. Output quality

This report provides a range of information that describes the quality of the data and details any points that should be noted when using the output. We have developed Guidelines for Measuring Statistical Quality; these are based upon the five European Statistical System (ESS) Quality Dimensions. This report addresses these quality dimensions and other important quality characteristics, which are:

- relevance
- timeliness and punctuality
- coherence and comparability
- accuracy
- output quality trade-offs
- assessment of user needs and perceptions
- accessibility and clarity

More information is provided about these quality dimensions in the following sections.

4. About the output

Relevance

(The degree to which statistical outputs meet users’ needs.

The concept of avoidable mortality was first introduced by Rutstein et al. in the 1970s. They listed conditions where a single case of untimely death would justify asking the question, “Why did it happen?” They also selected conditions in which critical increases in rates of untimely death could serve as an index of the quality of healthcare (Rutstein et al., 1976). These causes of avoidable deaths were intended to highlight areas of healthcare quality that could benefit from improvements.

Rutstein also noted that the list of conditions considered to be avoidable would need to be updated in light of improvements in medical knowledge and practice, as well as social and environmental changes.
In England and Wales, Charlton et al., (1983) were the first to examine avoidable mortality. They investigated the geographic variations in mortality between 1974 and 1978 using 14 amenable causes of death selected from Rutstein’s list. Following their work, an attempt was made to compile an atlas on avoidable mortality in the European Community. The conditions included in this atlas were meant to provide warning signals of potential shortcomings in healthcare delivery. The atlas also provided conditions for which a proportion of deaths can be prevented.

The atlas also provided a basis for the more recent concept of avoidable mortality that differentiates between conditions amenable to healthcare (treatable) and those preventable through wider public health policies. Some of the more recent lists of avoidable causes of death include those produced by Nolte and McKee (2004) and Page et al., (2006). These cause lists were adopted as the basis for our definition of avoidable mortality. They have been amended and updated to make them more relevant to the UK and to take account of more recent developments in health public policy.

Although research on avoidable mortality has gone on for the last 3 decades, there is little consensus among researchers on how to define it. Researchers have conceptualised avoidable mortality and its sub-categories in slightly different ways, but a common theme, also used within this output is that:

- deaths that could be avoided through the efforts of healthcare services are “amenable”
- deaths that could be avoided by broader interventions, for example, accident prevention, are “preventable”
- “avoidable” deaths are the sum of the “amenable” and “preventable” sub-categories

One of the main expected uses of these statistics is the monitoring of the performance of healthcare and public health policies. The Department of Health uses Potential Years of Life Lost from causes considered amenable to healthcare as an indicator in its NHS Outcomes Framework and mortality from preventable causes as an indicator in its Public Health Outcomes Framework.

There is growing local and international interest in statistics on avoidable mortality. In the UK, charitable organisations such as the Hepatitis C Trust, the British Lung Foundation and the British Association for the Study of the Liver are keen to see the conditions or diseases they campaign about included in the list of causes of death considered avoidable. It is anticipated that inclusion of these conditions on the cause list would draw increased attention towards them and allow comparisons of trends to be made against other conditions.

At an international level, the European Union-funded project Avoidable mortality in the European Union: Towards better indicators for the effectiveness of health systems (AMIEHS, 2011) aims to develop a list of indicators (causes of death) for which mortality rates are likely to reflect variations in the effectiveness of healthcare, as defined by primary care, hospital care and personalised health services. To date, the project has developed an ATLAS containing trends in mortality for 45 possible amenable causes. Similarly, the Organisation for Economic Co-operation and Development (OECD) published a working paper in 2011 Mortality amenable to healthcare in 31 OECD countries: estimates and methodological issues. The study assessed the feasibility of using amenable mortality as an indicator of the performance of healthcare systems in OECD countries, concluding that the potential for this indicator for cross-country comparisons of healthcare effectiveness is very high.

**Timeliness and punctuality**

(Timeliness refers to the lapse of time between publication and the period to which the data refer. Punctuality refers to the gap between planned and actual publication dates).

The provisional date for the annual release of Avoidable mortality in England and Wales is pre-announced on the GOV.UK website and on the ONS release calendar 12 months in advance. The date is then finalised at least 1 month before publication. Statistics are published around May each year (17 months after the end of the reference period), following the release of the final annual death registrations data in November.
For more details on related releases, the GOV.UK website provides 12 months’ advance notice of release dates. In the unlikely event of a change to the pre-announced release schedule, public attention will be drawn to the change and the reasons for the change will be explained fully at the same time, as set out in the Code of Practice for Official Statistics.

5. How the output is created

Avoidable mortality in England and Wales is compiled using information supplied when a death is registered. A record for each death registered in England and Wales is held on the Office for National Statistics (ONS) Deaths Registrations Database. Further details about the information held on the ONS Deaths Registrations Database, and the methods used to quality assure the data can be found in User Guide to Mortality Statistics.

All deaths in England and Wales are coded by ONS according to the International Classification of Diseases (ICD) produced by the World Health Organisation. The Tenth Revision (ICD 10) has been used by ONS since 2001 and coincides with the beginning of the time series on avoidable mortality in previous releases.

Avoidable deaths are all those defined as preventable, amenable or both, where each death is counted only once. Where a cause of death is both preventable and amenable, all deaths from that cause are counted in both categories when they are presented separately. The number of deaths where a potentially avoidable condition was included as the underlying cause on the death certificate, by sex and age group (less than 1, 1 to 4, 5 to 9... 85 to 89, 90 and over), for England and Wales are extracted from the ONS Death Registrations Database. Since information is held for all deaths registered, it is possible to extract actual counts of deaths, representative of the whole England and Wales population. No modelling or imputation of the number of deaths is necessary.

Since 1986, we have used the internationally recommended death certificate for neonatal deaths (infants under 28 days old). This certificate is designed to record all conditions found at death, but means that neonates cannot be assigned an underlying cause of death. As a result, neonatal deaths are not included in the avoidable mortality statistics.

Two mortality indicators are presented in the annual bulletin – age-standardised mortality rates and age-standardised potential years of life lost (SYLL).

Age-standardised mortality rates are calculated using the number of deaths registered in a year and mid-year population estimates (MYPE) for that year. The latter are provided by the Population Estimates Unit at ONS. Information about the methods used to calculate MYPEs can be found in the Methodology Guide for Mid-year Population Estimates.

Age-standardisation allows for differences in the age structure of populations to be taken into account and therefore allows valid comparisons to be made between geographical areas. We use the direct method of standardisation. In this method, the age-specific rates for each year are applied to a standard population structure to obtain the number of cases expected in each age group in the standard population. The numbers of expected cases are then added up across all age groups and divided by the total standard population to obtain a summary rate figure.

A Microsoft Excel template that demonstrates how age-standardised rates and 95% confidence intervals are calculated is available.

Age-standardised rates are calculated as follows:

$$\sum_{i} w_i r_i$$

$$\sum_{i} w_i \times 100,000$$

(expressed per 100,000 population)
where:

- $i$ is the age group (less than 1, 1 to 4, 5 to 9, 10 to 14...85 to 89, 90 and over)
- $w_i$ is the number, or proportion, of individuals in the standard population in age group $i$
- $r_i$ is the observed age-specific rate in the subject population in age group $i$, given by:

$$r_i = \frac{d_i}{n_i}$$

where:

- $d_i$ is the observed number of deaths in the subject population in age group $i$
- $n_i$ is the number of individuals in the subject population in age group $i$

Our mortality rates are age-standardised using the 2013 European Standard Population (ESP) as the standard population structure. Age-standardised rates based on the previous definition of avoidable mortality (data years 2001 to 2013) were revised in 2015 in light of the switch to the 2013 ESP. The ESP was first introduced in 1976 but it has since been recognised that it is no longer representative of the age-structure of the population of European Union member states. In light of this, Eurostat implemented a new version of the ESP in 2013. The 2013 ESP takes into account changes in the EU population, providing a more current, methodologically sound and widely acceptable basis for the calculation of age-standardised rates (Eurostat, 2013).
Table 1: The 2013 European Standard Population

<table>
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<th>Age group (years)</th>
<th>Population (number)</th>
<th>Abridged version</th>
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<tr>
<td>1 to 4</td>
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<td>5 to 9</td>
<td>5,500</td>
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<td>10 to 14</td>
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<tr>
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</tr>
<tr>
<td>Total</td>
<td>100,000</td>
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Source: Eurostat

Potential years of life lost (PYLL) is a measure of the potential number of years lost when a person dies prematurely from any cause. The basic concept underpinning PYLL is that deaths at younger ages are weighted more heavily than those at older ages. The advantage of doing this is that deaths at younger ages may be seen as less important if cause-specific death rates were used on their own in highlighting the burden of disease and injury. This is because conditions such as cancer and heart disease often occur at older ages and have relatively high mortality rates.

To enable comparisons between areas and over time, age-standardised PYLL rates, also known as SYLL rates, are calculated. These rates represent the potential years of life lost if the population of England and Wales had the same population structure as the 2013 ESP. SYLL rates are presented as years of life lost per 100,000 people.
PYLL is calculated as the sum of the mortality rate in each age group weighted by the potential number of years of life lost as indicated by remaining life expectancy for each age group. To calculate SYLL, this is then standardised to the 2013 ESP:

**Calculation of age-standardised years of life lost (SYLL)**

\[
\text{SYLL Rate} = \frac{\sum_i w_i \cdot \frac{a_i d_i}{n_i}}{\sum_i w_i} \times 100,000
\]

Where:

- \( i \) is the age group (less than 1, 1 to 4, 5 to 9, 10 to 14...85 to 89, 90 and over)
- \( d_i \) is the number of deaths in age group \( i \)
- \( a_i \) is the weight, or average age-specific period life expectancy in age group \( i \) for a given year
- \( n_i \) is the population in age group \( i \)
- \( w_i \) is the number of individuals in the standard population in age group \( i \)

### 6. Validation and quality assurance

**Accuracy**

(The degree of closeness between an estimate and the true value.)

It is a legal requirement that all deaths are registered in England and Wales. However, the accuracy of mortality statistics is dependent on the quality of information supplied when the death is registered. An inaccurate cause of death may be provided by the doctor completing the death certificate or a contributory condition may be omitted. Many thousands of practicing doctors complete death certificates and the nature and amount of training they have had in death certification varies greatly. Inaccurate information may also be supplied by the informant (usually a relative of the deceased), who takes the death certificate to register the death with the registrar and supplies further information about the death not captured on the death certificate. It is not possible to measure the magnitude of errors such as these.

*Guidance on death certification*, with specific reference to healthcare-associated infections, was issued to doctors in May 2005 (revised in 2010). This was followed by a message from the Chief Medical Officer to all doctors reminding them of their responsibilities with respect to death certification and drawing their attention to the guidance.

Deaths should be registered within 5 days of occurring but, in some cases, the registration may be delayed so that registration may not take place in the same calendar year as the death occurred. Since mortality statistics are generally reported by the year of registration, this may lead to the under-reporting of deaths. This is most likely to occur in cases where the death is referred to a coroner and an inquest is held. Deaths are referred to a coroner in cases including where the cause of death is unknown, where the deceased was not seen by a doctor before or after death, or where the death was violent, unnatural or suspicious. If the coroner chooses to hold an inquest, the death can only be registered once the inquest has taken place. Further information about the process of death registration can be found in *User Guide to Mortality Statistics*. 
Age-standardised mortality and age-standardised years of life lost (SYLL) rates are published with 95% confidence intervals (CIs) to allow users to identify significant differences between geographical areas, the sexes and over time. Significance is assigned on the basis of non-overlapping CIs. While more formalised and accurate methods of significance testing are available, the non-overlapping CI method is used because it is both simple to calculate and easily understood. As a general rule, if the confidence interval around an estimate overlaps with the interval around another, there is no significant difference between the two estimates.

Age-standardised rates are not calculated where there were fewer than 10 deaths in a year. It is our practice not to calculate rates based on such small numbers, as they are imprecise and susceptible to inaccurate interpretation. Age-standardised rates based on 10 to 19 deaths are marked with a “u” to warn users that their reliability is low.

The methods used in previous bulletins to calculate standard errors and 95% CIs have now been modified. Data from 2013 onwards will now be based on the following methods while historical data have been revised in light of the new methods.

Modifications to standard error and confidence interval calculations

Standard error for age-standardised rates

Before the 2013 data year, the standard error for age-standardised rates was calculated using a simple approximation method as shown in the following equation. The standard error is denoted as SE(ASR) and calculated as:

\[
SE(ASR) = \frac{ASR}{\sqrt{N}}
\]

Where:

- ASR is the age-standardised rate
- N is the total number of deaths in all age groups in each year

The age-standardised rate is a weighted sum of age-specific death rates where the age-specific weights represent the relative age distribution of the standard population (in this case the 2013 European Standard Population (ESP)). Therefore, it is more accurate to calculate its variance as the sum of the age-specific variances and to estimate its standard error as the square root of the variance as shown in the following equation.

\[
SE(ASR) = \sqrt{\sum_i w_i \left( \frac{w_i^2 \cdot r_i^2}{d_i} \right)}
\]

Where:

- \( w_i \) is the number of individuals in the standard population in age group \( i \)
- \( r_i \) is the crude age-specific rate in the local population in age group \( i \)
- \( d_i \) is the number of deaths in the local population in age group \( i \).
The standard error calculation has now been modified so that it takes into account the variance of the weighted sum of age-specific rates.

**Confidence intervals**

The mortality data in this release are not subject to sampling variation as they were not drawn from a sample. Nevertheless, they may be affected by random variation, particularly where the number of deaths or probability of dying is small. To help assess the variability in the rates, they have been presented alongside 95% CIs.

The choice of the method used in calculating confidence intervals for rates will in part depend on the assumptions made about the distribution of the deaths data these rates are based on. Traditionally, a normal approximation method has been used to calculate confidence intervals on the assumption that avoidable deaths are normally distributed. However, if the annual number of avoidable deaths are relatively small (fewer than 100), they may be assumed to follow a Poisson probability distribution. In such cases, it is more appropriate to use the confidence limit factors from a Poisson distribution table to calculate the confidence intervals instead of a normal approximation method.

The method for calculating confidence intervals for rates based on fewer than 100 deaths was proposed by Dobson et al., (1991) as described in Association of Public Health Observatories, (2008). In this method, confidence intervals are obtained by scaling and shifting (weighting) the exact interval for the Poisson-distributed counts (number of deaths in each year). The weight used is the ratio of the standard error of the age-standardised rate to the standard error of the number of deaths.

The lower and upper 95% CIs are denoted as \( ASR_{\text{lower}} \) and \( ASR_{\text{upper}} \), respectively, and calculated as:

\[
ASR_{\text{lower}} = ASR + (D_l - D) \cdot \sqrt{\frac{v(ASR)}{v(D)}}
\]

\[
ASR_{\text{upper}} = ASR + (D_u - D) \cdot \sqrt{\frac{v(ASR)}{v(D)}}
\]

Where:

- \( D_l \) and \( D_u \) are the exact lower and upper confidence limits for the number of deaths, calculated using confidence limit factors from a Poisson probability distribution table
- \( D \) is the number of deaths in each year
- \( v(ASR) \) is the variance of the age-standardised rate
- \( v(D) \) is the variance of the number of death

Where there are 100 or more deaths in a year the 95% confidence intervals for age-standardised rates are calculated using the normal approximation method shown in the following equation:

\[
ASR_{\text{LL/UL}} = ASR \pm 1.96 \cdot SE
\]

Where:

- \( ASR_{\text{LL/UL}} \) represents the upper and lower 95% confidence limits, respectively, for the age-standardised rate
Coherence and comparability

(Coherence is the degree to which data that are derived from different sources or methods, but refer to the same topic, are similar. Comparability is the degree to which data can be compared over time and domain, for example, geographic level.)

Population estimates revision

Data for England, Wales and regions of England are produced using the same methods. For these geographies, deaths of non-residents are excluded from published figures. Conversely, figures for England and Wales combined include deaths of non-residents. This means that the sum of the number of deaths in England and Wales separately does not equal the overall figure for England and Wales combined. In order to establish the number of deaths separately for England and for Wales we must use the postcode of the usual residence of the deceased. Therefore deaths from those not usually resident in England or Wales will be excluded from these counts. For England and Wales combined we calculate our statistics based upon all deaths registered in England or Wales irrespective of their postcode of usual residence.

Avoidable death rates for each geographical area are calculated by using the latest available deaths data and mid-year population estimates. Population estimates for England and Wales and regions of England from 2002 to 2010 have been revised in light of the 2011 Census populations. Previously published data on avoidable mortality relating to this period were therefore rebased on these revised populations in the 2011 bulletin.

Revision of definition

Our first definition for avoidable mortality was developed in consultation with experts for the specific purpose of quantifying the number of potentially avoidable deaths from 2001 onwards. This means that the causes of death are consistently defined using International Statistical Classification of Diseases and Related Health Problems: ICD-10.

We plan to review and, if appropriate, revise the definition of avoidable mortality periodically to take into account advancements in medicine and wider public health policy. Following such a review, we will not rebase published figures using the revised avoidable mortality definition. This is because deaths from the conditions listed in the definition have to be avoidable through the medical or wider public health context at the time of death.

In 2015, we conducted a public consultation to review the definition of avoidable mortality. Following this, a revised definition was published in May 2016 and from the data year 2014 onwards we have implemented this new definition.

The impact of this change is small when considering overall avoidable mortality rates, however, for amenable mortality alone there is a significant increase in age-standardised mortality rates. This is in most part due to the reclassification of chronic obstructive pulmonary disorder as both amenable and preventable. Further information on the new definition and its impact on the reporting of avoidable mortality statistics is available. As well as revising the existing definition, a new separate indicator of avoidable mortality in children and young people (aged 0 to 19 years) was developed.

ICD-10 coding changes implemented in 2011

In 2011, we updated the software used for cause of death coding from ICD-10 version 2001.2 to version 2010. Following this, we carried out a bridge study to help users understand the likely impact of this change on mortality statistics for England and Wales. The main changes in the ICD-10 version are amendments to the rules used in selecting the underlying cause of death. Overall, the impact of these changes is small although some cause groups are affected more than others.
Many of the conditions affected by the software version change are not included in the avoidable mortality definition. In the majority of cases, where conditions are affected, deaths previously coded to one condition are now coded to another condition also included in the list of causes of avoidable deaths. Therefore, the coding change will have had little impact on the summary avoidable mortality figures published since 2011.

For example, analysis presented in the 2011 drug-related deaths bulletin showed that the number of deaths coded as illicit drug use disorders (ICD-10 codes F11 to F16 and F18 to F19) decreased by 84% in version 2010, compared with version 2001.2. However, these deaths were allocated to accidental poisonings by drugs (ICD-10 code X40 to X44), which is also a cause of avoidable deaths. The impact of coding changes on cause groups may be more pronounced.

**Methodological changes affecting age-standardised rates**

From 2014, all our age-standardised mortality rates are now based on the 2013 European Standard Population (ESP). From 2013 data year, avoidable mortality indicators were produced using the 2013 ESP. Previously published data for 2001 to 2012 produced using the 1976 ESP were revised and published alongside data for 2013.

An Office for National Statistics report examining the impact of the change in ESP on mortality data showed that sex-specific rates, for causes where deaths predominantly occur at older ages, are significantly higher under the 2013 ESP compared with the 1976 ESP. This is because the larger number of older people in the 2013 ESP exerts more influence on such rates than the 1976 ESP. The difference between death rates based on the old and new ESP is purely methodological and does not indicate an actual increase in previously published numbers of deaths or death rates.

In future, we intend to publish all age-standardised rates using the full 2013 ESP (with an upper age limit of 95 and over). However, until official population denominators are available for the oldest age group in the 2013 ESP, crude rates will continue to be standardised using the “condensed” 2013 ESP with an upper age limit of 90 and over. The report shows that rates based on an upper age limit of 90 and over are not significantly different from those based on 95 and over. The version of the ESP and upper age limits used will be clearly marked in all our publications.

**7. Concepts and definitions**

(Concepts and definitions describe the legislation governing the output and a description of the classifications used in the output.)

The International Classification of Diseases (ICD) is the standard diagnostic tool for epidemiology, health management and clinical purposes. It is used to classify diseases and other health problems recorded on many types of health and vital records including death certificates and health records. In addition to enabling the storage and retrieval of diagnostic information for clinical, epidemiological and quality purposes, these records also provide the basis for the compilation of national mortality and morbidity statistics by World Health Organisation (WHO) member states. It is used for reimbursement and resource allocation decision-making by countries. We have used ICD-10 since 2001.

Underlying cause - defined by WHO as “the disease or injury which initiated the train of morbid events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury”, in accordance with the rules of the International Classification of Diseases.

Avoidable mortality - avoidable deaths are all those defined as preventable, amenable, or both, where each death is counted only once. Where a cause of death falls within both the preventable and amenable definition, all deaths from that cause are counted in both categories when they are presented separately.
Amenable mortality - a death is amenable if, in the light of medical knowledge and technology at the time of death, all or most deaths from that cause (subject to age limits if appropriate) could be avoided through good quality healthcare.

Preventable mortality - a death is preventable if, in the light of understanding of the determinants of health at the time of death, all or most deaths from that cause (subject to age limits if appropriate) could be avoided by public health interventions in the broadest sense.

8. Other information

Output quality trade-offs

(Trade-offs are the extent to which different dimensions of quality are balanced against each other.)

Each edition of Avoidable mortality in England and Wales is published as early as possible to meet user need for timely figures. Coding and quality assurance of death registration data is time-consuming and these checks are often finalised around June each year, 6 months after the reference year. The avoidable mortality release is published around May each year, 17 months after the end of the reference period. Although users have indicated an interest for more timely data, it has not yet been possible to produce the release earlier because of resource constraints.

Similar to most mortality statistics, avoidable mortality figures are based on deaths registered in a particular calendar year, not those occurring in that year. For the majority of the causes included in the avoidable mortality definition, deaths would be registered in the same year they occurred. However, for causes such as intentional injuries that are referred to a coroner for further investigation, deaths may not be registered in the same year they occurred.

Legislation in England and Wales means that when a coroner’s inquest takes place, the death cannot be registered until the inquest is completed. Since we have no information about a death until it is registered, it can take months or even years for a death to be added to our mortality database. The only exception is when the coroner adjourns the inquest and carries out an “accelerated registration”, while awaiting the outcome of criminal proceedings.

Consequently, reporting deaths by year of registration does not capture all of the deaths that occurred in the reference year. However, deaths reported by year of registration will include delayed registrations of deaths that occurred in previous years. Consistently reporting death statistics based on year of registration ensures that data for each year are comparable in terms of their completeness.

Assessment of user needs and perceptions

(The processes for finding out about user and users, and their views on the statistical products.)

The current definition of avoidable mortality was developed after we consulted with stakeholders in 2015. The aim of the consultation was to ensure that the views of statistics users, academics and other topic experts were taken into account in reviewing the list of causes of death included in the avoidable mortality definition. A summary of the consultation responses was published in October 2015. We will revise the definition of avoidable mortality periodically.
We present avoidable mortality statistics using directly age-standardised rates. This measure is widely used in presenting mortality statistics and there is a standard method for carrying out the calculations. However, in response to demand from customers, from 2011, figures are also presented for the standardised years of life lost. While this does not reflect a change to our formal measure of avoidable mortality, it provides users with a means of quantifying the impact of avoidable deaths from causes occurring predominantly at younger ages. It should be noted that the two measures are not directly comparable and figures based on standardised years of life lost are presented for England and Wales only.

Feedback from users is invited in the statistical bulletin. Direct email and telephone correspondence is maintained with a range of users including government users, students and academics and members of the general public. Details of the nature of any enquiries or additional data requested are held on a customer database.

9. Sources for further information or advice

Accessibility and clarity

(Accessibility is the ease with which users are able to access the data, also reflecting the format in which the data are available and the availability of supporting information. Clarity refers to the quality and sufficiency of the release details, illustrations and accompanying advice.)

Our recommended format for accessible content is a combination of HTML webpages for narrative, charts and graphs, with data being provided in usable formats such as CSV and Excel. The Office for National Statistics (ONS) website also offers users the option to download the narrative in PDF format. In some instances other software may be used, or may be available on request. Available formats for content published on the ONS website but not produced by ONS, or referenced on the ONS website but stored elsewhere, may vary. For further information please refer to the contact details at the beginning of this report.

For information regarding conditions of access to data, please refer to the following links:

- Terms and conditions (for data on the website)
- Accessibility

In addition to this Quality and Methodology Information, quality information relevant to each release is available in the relevant statistical bulletin.