

Mortality statistics in England and Wales QMI

Quality and methodology information for mortality statistics in England and Wales.

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Table of contents

1. [Output information](#)
2. [About this Quality and Methodology Information report](#)
3. [Important points about mortality data](#)
4. [Quality Summary](#)
5. [Quality characteristics of the mortality data](#)
6. [Methods used to produce the mortality data](#)
7. [Other information](#)

1 . Output information

National Statistic		
Data collection	Administrative data	
Frequency	Weekly, monthly and annually	
How compiled	Based on third-party data	
Geographic coverage	England and Wales	
Contact	Health.Data@ons.gov.uk	
Last revised	July 2021	Related publications <ul style="list-style-type: none"> Weekly deaths Monthly Mortality Analysis Deaths Registered in England and Wales (Series DR) Deaths registered by area of usual residence. UK 20th Century mortality files 21st Century mortality files

2 . About this Quality and Methodology Information report

This quality and methodology report contains information on the quality characteristics of the data (including the European Statistical System five dimensions of quality) as well as the methods used to create it.

The information in this report will help you to:

- understand the strengths and limitations of the data
- learn about existing uses and users of the data
- understand the methods used to create the data
- help you to decide suitable uses for the data
- reduce the risk of misusing data

3 . Important points about mortality data

- The Births and Deaths Registration Act (1836) made it a legal requirement for all deaths to be registered from 1 July 1837.
- The Local Registration Service, in partnership with the [General Register Office](#) (GRO), register deaths occurring in England and Wales.
- Mortality data for Scotland and Northern Ireland are published by [National Records of Scotland](#) and [Northern Ireland Statistics and Research Agency](#), respectively.
- Coding for cause of death is carried out according to the World Health Organization (WHO) International Classification of Diseases (ICD-10) and internationally agreed rules, allowing for international comparisons.

4 . Quality Summary

Overview

Mortality statistics in England and Wales are based on the details collected when deaths are certified and registered. Provisional figures, which have not been subject to the full quality assurance process, are published [weekly](#) and [monthly](#). Statistics on deaths registered each year, based on final mortality data, are published in the [Deaths registered in England and Wales \(Series DR\)](#) bulletin alongside an [explorable dataset](#). Annual statistics on specific causes of death and topics of interest are published after this. Most mortality statistics published by the Office for National Statistics (ONS) cover deaths that occurred in England and Wales (the legal remit of ONS), but some statistics covering the UK and its constituent countries are also collated by ONS, such as [Deaths registered by area of usual residence, UK](#). UK statistics are based on data provided by [National Records of Scotland](#) and [Northern Ireland Statistics and Research Agency](#), who are responsible for mortality data in Scotland and Northern Ireland respectively.

More detailed information is available in the [User guide to mortality statistics](#).

Uses and users of mortality data

External users of mortality statistics include the [Department of Health and Social Care \(DHSC\)](#), the [Cabinet Office](#), and [Public Health England \(PHE\)](#), as well as devolved bodies such as [Welsh Government](#) and [Public Health Wales \(PHW\)](#). These organisations use the data to inform policy decisions, monitor the health of the population and measure progress against goals such as reducing stillbirth and neonatal mortality rates.

Other public sector organisations such as the [police force](#) and the [Home Office](#) are interested in data on external causes of death such as homicides (assault). The [Department for Work and Pensions \(DWP\)](#) feeds mortality data into statistical models for calculating pensions and benefits. [Local authorities](#) also use mortality data to aid planning and resource allocation.

Private sector organisations such as banks, insurance and investment companies are particularly interested in deaths by single year of age and region, which feeds into risk estimation models. Internationally, organisations such as [Eurostat](#), the [World Health Organization](#), and the [United Nations \(UN\) Statistics Division](#) use our mortality statistics, for example to monitor progress towards global indicators as part of the [UN's Sustainable Development Goals](#).

We use mortality statistics to:

- produce population estimates and population projections, both national and subnational
- produce life expectancy estimates
- quality assure census estimates
- report on social and demographic trends
- provide information on public health issues such as the coronavirus pandemic
- conduct health analyses
- further analyse mortality (for example, life expectancies and causes of death, including deaths from certain infections and drug-related deaths)
- further analyse infant mortality where infant deaths are linked to their corresponding birth record, to enable more detailed analyses on characteristics (for example, age of parents, birthweight and whether the child was born as part of a multiple birth)

Strengths and limitations

The main strengths of mortality data for England and Wales are:

- the data provides almost complete population coverage for deaths that occur in England and Wales, because death registration is a legal requirement
- the first release of provisional statistics is available 11 days after reference period, in our [Weekly deaths bulletin](#)

The main limitations of mortality data for England and Wales are:

- [because of registration delays](#), deaths by date of occurrence are always somewhat incomplete, whereas deaths by date of registration may include deaths that occurred months or even years earlier
- the data only contains information that is collected as part of civil registration, and some of this information is based on the details provided by the informant (usually a close relative)

Recent improvements

Recent improvement to the mortality data and publications include:

- on 1 January 2020, we updated the software used to code cause of death to the [Multicausal and Unicausal Selection Engine \(MUSE\)](#); this update reflected the latest medical and epidemiological thinking and improved the international comparability of our mortality statistics, as well as increasing the automation of coding compared with previous software.
- in 2020 and 2021, the amount of provisional, timely data published was increased to inform the coronavirus (COVID-19) pandemic response; this included more detail in [weekly deaths](#), a [new monthly publication](#), as well as a series of ad-hoc releases.
- to overcome some of the problems associated with [registration delays](#), we developed a [statistical model](#) to estimate the number of deaths likely to have occurred in each week, based on previous experience of the pattern of registration delays, including the effects of bank holidays.
- to enable analysis of demographics not included in the mortality data, such as [ethnicity](#) and [religion](#), we [linked mortality data with several other sources](#) including NHS patient records and the Census

5 . Quality characteristics of the mortality data

This section provides a range of information that describes the quality of the data and details any points that should be noted when using the outputs.

Relevance

(The degree to which statistical outputs meet users' needs for both coverage and content.)

Coverage

The registration of deaths occurring in England and Wales is carried out by the Local Registration Service in partnership with the [General Register Office \(GRO\)](#). Information collected at death registration in England and Wales is recorded on the Registration Online (RON) system by registrars. We quality assure mortality data for England and Wales and coordinate and publish statistics for the whole of the UK alongside statistics for each constituent country.

All deaths that occur in England and Wales must be registered in England and Wales. Deaths of those whose usual residence is outside England and Wales (non-residents) are included in total figures for “England and Wales” but are excluded from all smaller geographies. Our mortality statistics exclude deaths of all residents of England and Wales that occur (and are therefore registered) outside of England and Wales. More information on geographical coverage of our statistics is available in our [User Guide](#).

Content

To meet user needs, very timely but provisional counts of death registrations are published [weekly](#) and [monthly](#). The first release (weekly deaths) is available 11 days after the reference period.

Our first release of final annual data takes place in summer, when our Deaths registered in England and Wales (Series DR) [bulletin](#) and [tables](#) are published, alongside an [explorable dataset](#). More detailed figures are then released in a series of themed packages, covering topics such as drug-related deaths, suicides, and avoidable mortality; more detail on the range of releases published is available in our [User Guide to Mortality Statistics](#).

We ensure the analysis published meets users' needs through:

- regular meetings with government stakeholders such as Department for Health and Social Care, Public Health England, Public Health Wales, Welsh Government, National Records for Scotland, Northern Ireland Statistics and Research Agency
- public consultations on changes to methods such as the [definition of avoidable mortality](#) and [definition of alcohol-related deaths](#)
- feedback focusing on specific publications from users via phone and email

Accuracy and reliability

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

Data collection

Before submitting a death registration through the Registration Online (RON) system, the registrar will verify that all the information provided has been entered accurately. There are some automatic validation checks within RON to help the registrar with this process. Information supplied by the informant is generally believed to be correct since knowingly supplying false information may render the informant liable to prosecution for perjury. More information on the validation checks in RON and the information supplied when a death is registered and certified is available in our [User guide to mortality statistics](#).

The cause of death reported represents the final underlying cause of death. This takes account of additional information received from medical practitioners or coroners after the death has been registered; around 35% of deaths are referred to the coroner. The process of referral to a coroner and how referred deaths are dealt with varies between areas. A consultation on a [charter for the coroner service](#) took place in 2011 and aimed to “ensure a greater level of consistency across the country”. Annually, there are around 30,000 [coroner’s inquests](#) in England and Wales. Most are “short-form” conclusions such as:

- accident or misadventure
- natural causes
- suicide
- homicide

“Narrative” conclusions can be used by a coroner or jury instead of a short-form conclusion to express their conclusions as to the cause of death in more detail.

In deaths from injury and poisoning, some narrative conclusions clearly state the intent and mechanism. However, in a proportion the narrative conclusions give no indication of whether the fatal injury or toxic substance was self-administered or if there was deliberate intent to self-harm. We define these deaths as “hard to code”. In 2020, 8.2% of deaths coded as accidents were “hard to code”. So, narrative conclusions could inflate the number of deaths classified as accidents and decrease the number classified as intentional self-harm.

Since 2013, when a death is referred to a coroner for investigation, they may issue a Certificate of the Fact of Death (also known as an interim death certificate) to allow relatives to obtain probate and proceed with other practical arrangements without waiting for the outcome. In those cases where the coroner subsequently decides not to hold an inquest, the legal responsibility to register the death remains with the next of kin (or other person involved). In a small number of cases, the person responsible does not understand this responsibility. This is possibly because the interim death certificate resembles the formal certificate of death registration in appearance and serves most of the same purposes. This has led to a small number of deaths being unintentionally left unregistered. It is estimated that approximately 50 to 100 deaths a year remain unregistered for this reason. These unregistered deaths are not included in our mortality statistics.

Coding cause of death

Coding for cause of death is carried out according to the World Health Organization (WHO) International Classification of Diseases and Related Health Problems, Tenth Edition ([ICD-10](#)) and internationally agreed rules. More information can be found in [Section 9 of the User guide to mortality statistics](#).

Most deaths (around 80%) have the underlying cause of death coded automatically using coding software. Using an automated coding tool improves the international and temporal comparability of mortality statistics. The remainder are coded manually by experienced coders; manual coding is necessary for deaths involving a coroner's inquest. Periodical reports on persistent coding problems are referred to a medical epidemiologist for advice and to international forums.

The cause of death reported in our mortality statistics represents the final underlying cause of death. This takes account of additional information received from medical practitioners or coroners after the death has been registered; around 0.1% of deaths registered have their underlying cause amended. Sometimes the later information becomes available only after the extract used for analysis has been taken (particularly in the case of provisional statistics that are published soon after the reference period). Users with access to individual records of deaths may consequently find some differences with published statistics. Further information is available in [Section 9 of the User guide to mortality statistics](#).

The [Coroners and Justice Act 2009](#) aimed to reform the death certification process by introducing a single unified system. The introduction of [national medical examiners](#) and the scrutiny they provide is expected to improve the quality (precision and completeness) of the cause of death recorded on the medical certificate of cause of death (MCCD), helping to improve mortality statistics.

The consistency of manual cause of death coding for narrative conclusions (previously known as narrative verdicts; see data collection subsection) has been assessed; [narrative verdicts and their impact on mortality statistics](#) provides more information. In 2020, 0.7% of all deaths registered in England and Wales had a narrative conclusion and 46% of these had an external cause of death.

Quality assurance

Daily extracts of death registrations we receive from RON then pass through a series of automatic validation processes that highlight any inconsistencies. Internal consistency checks are then conducted to eliminate any errors made during the recording of deaths, and to ensure the annual dataset is complete. Any concerns relating to cause of death are referred to a medical advisor or epidemiologist. Once the dataset has been created, consistency checks are carried out on the analytical output ahead of publication. The [User guide to mortality statistics](#) provides more detail on all of these quality checks.

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.)

National and international comparisons

Our mortality statistics adhere to key international standards (for example, cause of death classification and coding), which facilitates international comparisons. Following recommendations from the Office for Statistics Regulation (OSR), a number of [theme groups](#) were set up to improve the coherence and accessibility of health and social care statistics across England and the UK. Government representatives from the four UK nations meet regularly as part of the mortality theme group, to align mortality statistics published by different bodies and improve consistency across the UK.

There is a large degree of comparability in mortality statistics between countries within the UK; all figures are based on the details collected when deaths are registered. We quality assure data for England and Wales, enabling detailed mortality statistics to be published. Similarly, National Records of Scotland (NRS) and the Northern Ireland Statistics and Research Agency (NISRA) quality assure data for their own countries and subsequently publish detailed mortality statistics based on deaths registered in the reference period. The definitions, classifications and methods used to produce published death statistics are broadly comparable across the four countries. More information can be found in the [Quality Information for Northern Ireland](#) and in the [Quality information for Scotland](#).

We publish several internationally recognised indicators that facilitate comparisons, such as crude death rates, infant mortality rates, and age-standardised mortality rates (standardised to the European Standard Population to enable comparisons between populations with different age structures, including between males and females and over time).

To enable international comparisons, the [Vital statistics in the UK publication](#) provides the crude death rate for different countries. Internationally, we provide data to [Eurostat](#), the World Health Organization (WHO) and the United Nations (UN) each year to allow them to compile mortality figures and enable comparison across countries.

Changes to methods and outputs over time

Revisions to mortality statistics occur infrequently and usually only take place following revisions to the mid-year population estimates, resulting in revised mortality rates. Footnotes are added to tables where revisions have taken place and are documented in supplementary information accompanying the release. Please see the [Revisions policy for population statistics](#) for more information.

The Still-Birth (Definition) Act 1992 changed the definition of a still-birth from a child being born after 28 weeks to after 24 weeks (which did not breathe or show any other signs of life). Consequently, data for 1992 onwards are not directly comparable with data for still-births before the introduction of the Act. Prior to 1993, annual mortality statistics were based on the number of deaths registered in a year. From 1993 to 2005, the figures related to the number of deaths that occurred in a year. From 2006 onwards, annual mortality statistics reverted to the number of deaths registered in a year. More details on these changes can be found in [Series DR](#) for 2006. Registrations are not entirely comparable to occurrences; however, the differences are relatively minor, and figures are broadly comparable for most causes.

In 2011, we revised our place of death definition to take account of improvements in the classification and coding of communal establishments. These changes were implemented for 2010 mortality statistics. In particular, the classification was changed to reflect user needs by identifying: local authority versus non-local authority care homes, NHS versus non-NHS hospitals, and other types of communal establishments (such as schools, hotels, university halls of residence, and prisons).

The European Standard Population (ESP) is an artificial population structure used to weight age-standardised mortality rates (ASMRs), enabling comparisons. Originally published in 1976, it was updated by Eurostat in 2013; this change has had a significant impact meaning that ASMRs based on the 1976 ESP are not comparable with those based on the 2013 ESP. The distribution of the 1976 and 2013 ESPs can be found in the [User guide to mortality statistics](#) and further information about the [change in ESP methods](#) is available.

On 1 October 2014, the Presumption of Death Act 2013 came into force in England and Wales. This enabled applications to the High Court for a declaration that a missing person is [presumed to be dead](#), where the person who is missing is thought to have died or has not been known to be alive for a period of at least seven years.

From the 2015 data year, ASMRs have been calculated using population estimates for all age groups. Prior to this, the number of live births were used for the population aged under one year. This change has had no significant impact on the rates. Further information on historical changes to the mortality data is available in the [User guide to mortality statistics](#).

Changes to cause of death coding over time

Changes in the cause-coding of mortality data may affect the interpretation of trends. Cause of death is currently coded using [ICD-10](#), which replaced ICD-9 on 1 January 2001. Overall, the vast majority of deaths remained in comparable chapters, but some diseases and conditions did move between chapters. The causes of death most affected included leukaemia, diseases of the liver and land transport accidents. There were also some changes to the rules governing the selection of underlying cause of death, especially [Rule 3](#), which had a large effect; further information on the [changes to mortality statistics following the move to ICD-10](#) is available. Comparability ratios were produced to ensure trends over time could be analysed and further assessments of the change were published in [Health Statistics Quarterly 13](#) and [Health Statistics Quarterly 19](#).

New ICD-10 codes are also implemented over time following guidance from the WHO, such as the codes for swine influenza and the coronavirus (COVID-19); more information on these is available in the [User guide to mortality statistics](#).

There have also been changes to the software used for automated coding over time:

- in 2001, we moved from using ICD-10 v2001.2 to ICD-10 v2010 and published initial assessments of [the impact on cause of death of moving to ICD10 v2010](#) and [the impact of moving to ICD v2010 for stillbirths and neonatal deaths](#). The impact of the change on specific causes is published alongside the relevant statistics for 2011.
- in 2014, we implemented IRIS software version 2013. This incorporated official updates to ICD-10 approved by the WHO. Further information can be found in the [dual coding study](#) and further study on the [impact of the coding changes on stillbirths and neonatal deaths](#).
- on 1 January 2020, we again updated the software to the Multicausal and Unicausal Selection Engine (MUSE) (IRIS version 5.5). This impacted data for deaths registered in 2020 onwards. More information is available on the [differences caused by the change of software](#).

Comparisons across reference periods and subnational geographies

Some considerations when comparing mortality statistics across different reference periods are:

- The number of registration days in a reference period can impact mortality statistics. For example, bank holidays can affect the number of registrations within a week or month because registry offices are usually closed. When it is likely that a bank holiday has affected our statistics, we add footnotes to explain the limitations of the analysis; this most frequently occurs in our weekly deaths bulletin.
- Weekly deaths counts cannot be summed to match the counts for monthly or annual deaths because weeks do not map directly onto months or years.
- Deaths analysed by date of registration and deaths analysed by date of occurrence are not comparable. Death occurrences are also revised over time (as we receive more death registrations, the number of deaths that occurred in an period will increase). This means that the number of death occurrences for a particular period is somewhat dependent on when the data was extracted. Therefore, death occurrences with different extract dates may not be comparable; this is represented in our bulletins with footnotes stating “including deaths registered up to” the date of registration.

Comparisons by geography over time are impacted by:

- Information provided by the informant: Since 1993, the informant has been able to decide what address to give if more than one might be applicable. Prior to 1993, there were “rules” determining the validity of one address over another (previous annual reference volumes contain details of these rules).
- Geographical boundaries used for analysis: Until the 2016 data year, annual mortality statistics by area of usual residence were produced using the boundaries that were in place during the year the death was registered. For 2017 data onwards, figures are based on the latest boundaries available. This approach means that changes in boundaries can affect the comparability of statistics over time.

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 web pages for narrative, charts and graphs, with data being provided in usable formats such as CSV, Excel and explorable datasets ([NOMIS](#) and [Customise My Data](#)). Our website also offers users the option to download the narrative in PDF format. In some instances, data are presented in other formats such as interactive charts or dashboards, for example [Coronavirus \(COVID-19\) latest insights](#).

Special extracts and tabulations of mortality data for England and Wales are available to order (subject to legal frameworks, disclosure control, resources and the [ONS charging policy](#)). Such enquiries should be made to the Health Analysis and Life Events Customer Services team (email Health.Data@ons.gov.uk or telephone +44 (0) 1329 444110). We publish all [user-requested data](#).

Access to microdata and disclosive data - that is, data that have the potential to identify an individual record - requires the approval of the ONS Microdata Release Procedure (MRP) before the data can be provided. More information on [how to access microdata as an accredited researcher](#) is available.

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

- [Terms and conditions \(for data on the website\)](#)
- [Accessibility](#)
- [Freedom of information](#)
- [Requesting statistics](#)

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.)

To meet user needs, very timely but provisional counts of death registrations are published by [week](#) (11 days after the week ends) and by [month](#) (around 20 days after the month ends). The first release of annual figures, based on final data, are published around 7 months after the reference year in our [Deaths registered in England and Wales bulletin](#), following full quality assurance of the data. Mid-year population estimates for the reference year are also required to calculate mortality rates; these are usually published in June. More detailed statistics on death registrations are published in themed packages after this first release.

For more details on related releases, the [GOV.UK release calendar](#) provides up to 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 Statistics](#).

Concepts and definitions

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

Historical changes to the legislation that governs mortality statistics in England and Wales is outlined in [Section 16 of the User guide to mortality statistics](#). A [glossary of terms](#) used in mortality statistics is also available.

6 . Methods used to produce the mortality data

More detailed information on the main processes used in the compilation of mortality statistics is available in our [User guide to mortality statistics](#).

How we collect the data, main data sources and accuracy

Mortality statistics are based on the administrative data collected when deaths are certified and registered in England and Wales. Deaths that occur in England and Wales should be registered within five days of the date of death. There are, however, situations where the registration of a death will be delayed (for example, if the death is referred to a coroner). We published analysis of the [impact of registration delays on mortality statistics](#) annually.

How we process the data

We receive data on deaths from registry offices electronically through the Registration Online (RON) system on a daily basis. Routine and automated checks are carried out on each file and the combined data are then loaded onto the deaths database. Regular receipt and diagnostic reports are produced, resulting in weekly contacts with the identified registrars to resolve any problems. Automated validation processes highlight any inconsistencies and then coding takes place to assign variables such as occupation and cause of death.

How we analyse and interpret the data

The analytical methods used vary by publication and topic, but frequently includes numbers of deaths and age-standardised rates. Detailed information on the [calculation of different types of rates](#) is available.

How we quality assure and validate the data

In addition to the [validation and quality checks during processing](#), analytical outputs are quality assured prior to publication. Specific procedures depend on the type of analysis, but may include:

- independent dual-run of analysis by two individuals
- comparing trends and patterns against previous periods to check for plausibility
- cross-checking figures that should be equal or similar across different analyses
- checking output tables to ensure that there are no human errors during the creation of published tables
- peer review of publications and tables by colleagues not directly involved in the analysis
- collaboration with external experts with detailed topic or policy knowledge

How we disseminate the data

Analyses are freely available on the [ONS website](#); for details on how we disseminate the statistics see [Section 5. Accessibility and clarity subsection](#).

How we review and maintain the data processes

We continuously update the validation checks carried out during data processing, based on surveillance of data quality; where quality issues are found, validation checks are added into our routine process. Persistent issues in coding cause of death are referred to a medical epidemiologist for advice and highlighted to the authors of the coding software.

During analysis, we keep a log of any “near misses” (errors or issues that were identified and resolved close to the publication date) and review these periodically to determine procedures that could prevent similar issues in future. Other improvements to data processes are also identified through stakeholder engagement, for example through the following groups:

- [Mortality Reference Group](#) (to identify and solve problems relating to the interpretation and application of ICD-10 to coding of mortality)
- [IRIS Core Group](#) (to develop the software used to automatically code causes of death)
- [English Health Statistics Steering Group](#) and associated mortality theme group (to improve the coherence of health statistics and work collaboratively across the multiple health organisations in England)

7 . Other information

Useful links

For further information on data quality, legislation and procedures relating to mortality statistics, please see the [User guide to mortality statistics](#).

Our mortality statistics publications can be found on the [deaths section of the ONS website](#).

For deaths data for other UK countries, please see the [latest death statistics for Northern Ireland](#) and the [latest death statistics for Scotland](#).

Upcoming releases are pre-announced on the [release calendar](#).

For further queries on mortality statics published by ONS, to provide feedback on our statistics, or to request further mortality data email the Health Analysis and Life Events customer services team at: health.data@ons.gov.uk.