

User guide to mortality statistics

Supporting information for mortality statistics, which present figures on deaths registered in England and Wales in a specific week, month, quarter or year.

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1 . Introduction

We produce mortality statistics that are published under the [National Statistics logo](#), the designation guaranteeing that those outputs have been produced to high professional standards set out in the [Code of Practice for Statistics](#) and have been produced free from any political interference.

This guide provides information on the collection, production and quality of mortality statistics.

Provisional counts of death registrations

To meet user needs, very timely but provisional counts of death registrations in England and Wales are published as follows:

- [Provisional counts of weekly death registrations](#) by sex and age group and regions (within England) and Wales (published 11 days after the week ends)
- [Provisional counts of monthly death registrations](#) by regions (within England), unitary authorities, counties, districts and London boroughs (published on the fourth Tuesday of the following month); figures remain provisional until they are updated to final figures following the publication of final annual statistics
- [Quarterly mortality report, England](#) provides timely surveillance of mortality in England with provisional death registration and death occurrence data broken down by sex, age and underlying cause

Provisional figures have not been subject to the full quality assurance process.

Annual mortality statistics

Annual mortality statistics (based on deaths registered in a calendar year) are published in separate packages to enable the timely release of statistics.

[Deaths registered in England and Wales \(Series DR\)](#) provides death registration statistics for the reference year by numbers of injury and poisoning deaths by external cause of death, age, sex, marital status and rates for England and Wales.

It also includes numbers and rates for regions (within England), unitary authorities, counties, districts, London boroughs and local health boards (within Wales).

Numbers of deaths by single year of age and sex for England and Wales (1963 onwards) and the UK (1974 onwards) are also included.

Prior to deaths registered in 2018, some of these elements were produced in a separate publication titled '[Death registration summary tables](#)', these have now been combined with the '[Deaths registered in England and Wales](#)' release.

[Mortality statistics: area of usual residence](#) provides death registration statistics in the UK and its constituent countries (numbers and rates) by regions (England), unitary authorities, counties, districts, London boroughs, health areas, council areas (Scotland) and local government districts (Northern Ireland).

Detailed annual mortality statistics are available in an [explorable dataset](#) for England and Wales including:

- number of deaths by age group, sex, area of usual residence, leading cause of death and detailed underlying cause classified using the [Tenth Revision of the International Classification of Diseases and Related Health Problems \(ICD-10\)](#).
- figures are available for all areas within England and Wales by regions (England), unitary authorities, counties, districts and Middle layer Super Output Area (MSOA)
- age-standardised mortality rates (ASMRs) and percentages of all deaths, or within the whole population, sex or age group

We also publish more detailed annual mortality statistics in the following releases:

- [20th Century mortality files](#) provides death registration statistics for England and Wales by sex, age group and underlying cause
- [21st Century mortality files](#) provides death registration statistics for England and Wales by sex, age group and underlying cause
- [Deaths related to drug poisoning](#) provides number of deaths by cause of death, sex, age and substance(s) involved in the death by country for England and Wales; it also includes rates for deaths related to drug misuse by regions (within England), unitary authorities, counties, districts, London boroughs and average registration delay by local authorities (England) and unitary authorities (Wales)
- [Alcohol-related deaths in the UK](#) provides numbers and rates of alcohol-related deaths by sex, age group and individual cause of death by UK and its constituent countries and regions (within England)
- [Suicides in the UK](#) provides suicide rates by sex for the UK and its constituent countries; there are numbers and rates of narrative conclusions by sex and regions (within England) and Wales; it also includes numbers (registrations) and rates of suicides and median registration delay for local authorities (England) and unitary authorities (Wales); there are numbers of occurrences and rates by age and sex by country for England and Wales
- [Avoidable mortality](#) provides numbers and rates by sex and age by country for England and Wales for deaths from causes that are considered avoidable in the presence of timely and effective healthcare or public health interventions
- [Excess winter mortality](#) provides selected provisional and final numbers and indices by age, sex and cause for England and Wales, regions and local authorities (within England) and unitary authorities (Wales)
- [Deaths of homeless people](#) provides numbers by sex, age, underlying cause and region in England and Wales
- [Child mortality statistics](#) provides data on stillbirths, infant deaths and childhood deaths; this publication is based on infant deaths occurring in a calendar year, our [User Guide to Child mortality](#) provides further information
- [Infant mortality \(birth cohort\) tables](#) presents final statistics on births and infant deaths based on babies born in a calendar year that died before their first birthday linked to their corresponding birth notification and their corresponding death registration.
- [Unexplained deaths in infancy](#) provides data on both sudden infant deaths and deaths for which the cause remained unknown or unascertained

From 1974 to 2005, mortality statistics were published in the annual reference volumes, [DH1](#), [DH2](#) and [DH4](#). From 1993 to 2005, figures were based on deaths occurring annually in England and Wales in the reference year. Prior to 1993, figures were based on deaths registered in England and Wales in the reference year. In 2006, these three volumes were replaced by a single publication, Mortality statistics: [deaths registered in England and Wales \(Series DR\)](#) based on deaths registered in a reference year.

[Vital statistics: population and health reference tables](#) provide annual mortality statistics for the UK and its constituent countries with some measures available back to 1838. This release also provides an international comparison of the crude death rate.

Other sources

Mortality statistics for Scotland are available in the [Vital Events Reference Tables for Scotland](#).

Mortality statistics for Northern Ireland are available in the [Annual Report of the Registrar General for Northern Ireland](#).

A summary of mortality statistics also appear in the World Health Organization [World Health Statistics Annual](#) and [World Health Report](#).

The [Mortality statistics Quality and Methodology Information](#) report contains important information on:

- the strengths and limitations of the data
- the quality of the output: including the accuracy of the data and how it compares with related data
- uses and users
- how the output was created

The [ONS policy on protecting confidentiality in birth and death statistics](#) is available.

Our website provides a comprehensive source of freely available statistics on [life events](#) and other ONS products.

Special extracts and tabulations of mortality data for England and Wales are available to order (subject to legal frameworks, disclosure control, resources and our [charging policy](#), where appropriate). Such enquiries should be made to the Mortality Analysis team (mortality@ons.gov.uk or telephone: +44 (0)1633 456935). All [user requested data](#) will be published onto the website.

2 . Information collected at death registration

The registration of life events (births, deaths, marriages and civil partnerships) is a service carried out by the Local Registration Service in partnership with the General Register Office (GRO) in Southport.

Mortality statistics are based on information recorded when deaths are certified and registered. Most deaths are certified by a medical practitioner, using the Medical Certificate of Cause of Death (MCCD) [Annex A](#). This certificate is taken to a registrar by an informant – usually a near relative of the deceased.

Deaths should be registered within five days of the date of death, although there are a number of situations when the registration of a death will be delayed, as described in Section 6.

In certain cases deaths are referred to, and sometimes then investigated by, a coroner. The coroner sends information to the registrar and this is used instead of that on the MCCD to register the death. In some cases additional information provided on Part B of the coroner's certificate ([Annex C](#)) is forwarded to Office for National Statistics (ONS) by the registrar. Accordingly, the information used in ONS mortality statistics normally comes from one of four sources:

- details supplied by the doctor when certifying a death, for example, whether the body was seen after death, cause of death, when the deceased was last seen alive, whether a post-mortem was carried out
- details supplied by the informant to the registrar, for example, occupation of deceased, sex, usual address, date and place of birth, marital status, date of death, place of death
- details supplied by a coroner to the registrar following investigation, for example, cause of death (following post-mortem), place of accident (following inquest); in the case of deaths certified after inquest, the coroner supplies the registrar with all the particulars that would have been supplied by the informant
- details derived from information supplied by one of the above, for example, age of deceased is derived from date of birth and coded cause of death

Details are also supplied by the informant on the spouse of the deceased (only if the deceased is either married or civil partnered), for example, name, date of birth, occupation and employment status. If these details are supplied by the coroner rather than the informant then occupation and employment status will not be supplied.

The [death registration process in Northern Ireland](#) is similar to that in England and Wales, where deaths must be registered within five days, with the exception of those referred to a coroner. However, Scotland has a slightly different process, which [allows up to eight days for the registration of a death](#), in which time the [cause of death for accidental, sudden or suspicious deaths may not yet be established](#). These deaths are still registered within this period, where cause of death would later be updated in the [Register of Corrected Entries \(now the Register of Corrections Etc](#) (RCE), following an investigation.

3 . Occurrences, registrations and the standard dataset

The majority of mortality publications are now based on registrations. Office for National Statistics (ONS) continue to take an annual extract of death occurrences in the autumn following the data year, which is used for seasonal analysis of mortality data and several infant mortality outputs.

Since 2006, [Series DR](#) has been based on the number of deaths registered in the calendar year. Between 1993 and 2005, the figures in annual reference volumes relate to the number of deaths that occurred in the reference period. Prior to 1993, publications gave numbers of deaths registered in the period. More details on these changes can be found in the publication [Mortality statistics: deaths registered in 2006](#).

The numbers of registrations for a year that actually occurred in previous years are shown in Table 1.

Table 1: Number of deaths that were registered and occurred in each calendar year
England and Wales, 2001 to 2018

Annual Dataset Year for registrations	Number of registrations	Number registered which occurred in that year	Percentage of those registered that occurred in that year	Number registered which occurred in previous years	Percentage of those registered that occurred in previous years
2018	541,589	509,829	94.1	31,760	5.9
2017	533,253	505,452	94.8	27,801	5.2
2016	525,048	501,882	95.6	23,166	4.4
2015	529,655	504,483	95.2	25,172	4.8
2014	501,424	477,752	95.3	23,672	4.7
2013	506,790	482,658	95.2	24,132	4.8
2012	499,331	478,733	95.9	20,598	4.1
2011	484,367	463,450	95.7	20,917	4.3
2010	493,242	473,661	96.0	19,581	4.0
2009	491,348	471,113	95.9	20,235	4.1
2008	509,090	488,764	96.0	20,326	4.0
2007	504,052	485,068	96.2	18,984	3.8
2006	502,600	485,203	96.5	17,397	3.5
2005	512,993	497,603	97.0	15,390	3.0
2004	514,250	499,081	97.1	15,169	2.9
2003	539,151	524,827	97.3	14,324	2.7
2002	535,356	520,849	97.3	14,507	2.7
2001	532,498	517,010	97.1	15,488	2.9

Source: Office for National Statistics

Notes

1. Of the 541,589 deaths registered in 2018, 509,829 occurred in 2018, 29,905 occurred in 2017, 1528 occurred in 2016 and 327 occurred prior to 2016. [Back to table](#)

The numbers of late registrations not included in the death occurrence dataset are shown in Table 2.

Table 2: Number of late registrations not included in the annual death occurrence dataset
England and Wales, 2001 to 2017

Year death occurred	Number of late registrations not included in occurrence dataset
2017	1,517
2016	1,938
2015	2,320
2014	2,780
2013	2,946
2012	3,844
2011	3,127
2010	3,057
2009	3,317
2008	3,475
2007	3,484
2006	1,729
2005	2,433
2004	2,252
2003	2,036
2002	1,760
2001	1,378

Source: Office for National Statistics

The numbers of late registrations by year of occurrence are subject to future revisions due to the likely addition of late registrations; revisions could extend back a number of years.

4 . Base populations

The population estimates used to calculate mortality rates are mid-year estimates of the resident population of England and Wales based on the Census of Population. Our mid-year population estimates are updated figures using the most recent census, allowing for births, deaths, net migration and ageing of the population.

The population estimates used are the most up-to-date when rates are produced. The specific population estimates used to calculate rates are detailed alongside published tables. Sometimes it is necessary to revise mortality rates following population estimate revisions. Any revisions to mortality rates are footnoted on tables. Further information on [population estimates](#), and their methodology is available.

5 . Area coverage

Published mortality statistics are based on deaths registered in England and Wales; no distinction is made between residents of England and Wales, residents of other UK countries or visitors. Deaths of those whose usual residence is outside England and Wales are included in total figures for England and Wales but excluded from any sub-division of England and Wales. Table 3 gives recent numbers of deaths to non-residents.

Until the 2010 data year for deaths, Office for National Statistics (ONS) assigned “area of usual residence” using a look-up product (the National Statistics Postcode Directory). This product associated postcodes with a number of geographical levels (for example, local authority or region). The postcode was allocated to each level of geography using a point-in-polygon methodology. Although this method is spatially accurate, it does not provide the stable building blocks needed for comparing geographies at different levels.

From the 2011 data year for deaths, we have assigned “area of usual residence” by first linking each postcode to an output area using this same point-in-polygon methodology and then linking to all higher geographies by using a population-weighted, best-fit look-up to output area. This means that postcodes are allocated to a higher geography based on where the output area population-weighted centroid lies. This is in line with the [Geography Policy for National Statistics](#).

Switching to the new area allocation method had negligible impact on mortality statistics down to local authority level. However, the new method improved comparability of mortality statistics for subnational areas over time.

For more information about these methods, see [National Statistics Postcode Products](#). A paper investigating the [impact of the new method on life events data](#) was published in March 2013.

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 produced in annual publications will be based on the latest boundaries available at the time of the first release of mortality statistics for that year and the same boundaries will be used throughout the annual packages. Figures produced in ad-hoc publications will be based on the latest boundaries available.

Table 3: Number of deaths of non-residents registered in England and Wales

2014 to 2018	Number, per cent				
	2014	2015	2016	2017	2018
Deaths from					
all causes	501,424	529,655	525,048	533,253	541,589
of which, deaths of	1,110	1,148	1,191	1,123	1,324
residents outside					
England and					
Wales					
Percent of total	0.22	0.22	0.23	0.21	0.24

Source: Office for National Statistics

5.1 Usual residence of deceased

Details of the usual residence of the deceased are supplied by the informant to the registrar. Prior to 1993 there were rules determining the validity of one competing address over another for the purpose of registering the usual place of residence of the deceased. Previous annual reference volumes contain details of these rules. Since 1993, the informant can decide what address to give if more than one might be applicable.

Each year there are a small number of cases (around 0.1%) where no usual residence is provided by the informant. This may be because the deceased had no fixed abode or their address was unknown. In such cases, the usual residence is coded to where the death took place.

5.2 Place of occurrence

Due to improvements in the classification and coding of communal establishments, the place of death definition that we use was revised in 2011. These changes were implemented for 2010 mortality statistics. In particular, the classification was changed to specifically identify local authority and non-local authority care homes. The categories for NHS and non-NHS psychiatric hospitals, other hospitals and communal establishments for the care of the sick have also been replaced with a category for all hospitals. This reflects current user needs. Further improvements to how deaths are allocated to individual establishments and to how these are assigned to place of death categories is an ongoing exercise, which will improve the quality of this new classification.

The groups used for the place where death occurred are:

- home
- care home
 - local authority
 - non-local authority
- hospitals and communal establishments for the care of the sick (excluding psychiatric hospitals and hospices)
 - NHS
 - other than NHS
- hospices
 - NHS
 - other than NHS
- other communal establishments: includes schools, convents and monasteries, nurses' homes, university and college halls of residence, young offender institutions, secure training centres, detention centres, prisons and remand homes
- elsewhere: includes all places not covered elsewhere in this list and people who are pronounced dead on arrival at hospital

6 . Certification of cause of death

When a death occurs, the attending doctor completes a Medical Certificate of Cause of Death (MCCD) ([Annex A](#)). This is normally taken to the local registrar of births and deaths in the district in which the death occurred. Since April 1997, information may be provided to a registrar in a different district. This is known as the registration of deaths by declaration and is used mostly for the deaths of infants. Further details about deaths by declaration follow.

The certifying doctor must have seen the deceased during the last two weeks of life to complete a MCCD. This is normally delivered to the registrar by the informant (often a relative of the deceased), within five days of the date of death, as required by law. The majority of deaths are registered in this way. A specimen of the draft death entry completed by the registrar at the time of registration is reproduced at [Annex B](#) (old) and [Annex I](#) (new).

There are circumstances when a MCCD cannot be issued immediately, such as those deaths reported to a coroner, and the registration is consequently delayed. Some examples of these situations are given in the following sections.

6.1 Referral to the coroner

For some deaths the doctor may certify the cause and report the case to the coroner, or the registrar may report it. Deaths that should be referred to a coroner include those where:

- the cause is unknown
- the deceased was not seen by the certifying doctor either after death, or within the 14 days before death
- the death was violent, or unnatural, or suspicious
- the death may have been due to an accident (whenever it occurred)
- the death may have been due to self-neglect or neglect by others
- the death may have been due to an industrial disease, or related to the deceased's employment
- the death occurred during an operation or before recovery from the effects of an anaesthetic
- the death may have been a suicide
- the death occurred during or shortly after detention in police or prison custody
- there was no doctor available who was legally qualified to certify the death

Following a significant increase in applications for Deprivation of Liberty Safeguards (DoLS) between 2013 and 2015, and a consequent increase in coroner investigations and inquests into deaths where a DoL was in place, [it was recommended that these deaths were removed from the "in state detention" category \(PDF, 77KB\)](#). Since [changes to the Policing and Crime Act 2017](#), deaths under DoLS that occurred on or before 3 April 2017 should be treated outside the context of state detention and should only be reported to the coroner where one or more other conditions are met. We should therefore see a reversal of the trend for more inquests on natural deaths seen since 2009.

Coroners have a number of possible courses of action once a death has been referred. If they are satisfied that the death was due to natural causes and the cause has been correctly certified by a medical practitioner, the local registrar is notified (Form 100A – [Annex D](#)) and they can then register the death using the cause given on the MCCD. In rare cases where no medical certificate is available, the death will be registered as uncertified and the cause taken from Form 100A ([Annex D](#)).

Alternatively, the coroner may order a post-mortem examination. This may happen if the death was sudden and the cause unknown, if there was no doctor in attendance, or if the death has been referred directly to the coroner by the police. If the post-mortem shows unequivocally that the death was due to natural causes, the coroner notifies the registrar that they do not intend to hold an inquest (Form 100B – [Annex E](#)). In such cases, the cause of death given by the coroner on Form 100B is based on the information from the post-mortem held by the pathologist.

6.2 Coroners' inquests

If an inquest is necessary, the death can usually be registered only after the inquest has taken place. In a small number of cases the coroner holds an inquest without a post-mortem. In most cases the inquest concludes the investigation and the death is then certified by the coroner (Form 99(REV) – [Annex C](#)). This provides the registrar with details of the deceased and the inquest findings as to cause of death.

If someone is to be charged with an offence in relation to the death, the coroner must adjourn the inquest until those legal proceedings are completed. Since 1978 (see Section 9.4) it has been possible to register these deaths at the time of adjournment, when the coroner issues Form 120 ([Annex F](#)). This form includes details of injuries that led to the death, but no conclusion. In the case of motor vehicle incidents, there is enough information to code the cause of death. Other deaths, such as possible homicides, are given a temporary code for underlying cause of death (U50.9) until final information becomes available. This is supplied by the coroner to the registrar on Form 121 ([Annex G](#)).

6.3 Legally uncertified deaths

A very small percentage of deaths remain legally uncertified ([An analysis of legally uncertified deaths in England and Wales, 1979-2002](#)). In recent years this figure has remained around 0.3% of all deaths registered in England and Wales.

We receive copies of at least one certificate of cause of death for these cases, which are registered and coded as normal. This group includes deaths for which the doctor, who completed the medical certificate, did not fulfil all the legal requirements for doing so. For example, where the doctor was not in attendance with the deceased during the last illness, or did not see the body, and the coroner did not order a post-mortem but issued Form 100A ([Annex D](#)). It also includes deaths of foreign military personnel in England and Wales where the certifying doctor was not a registered medical practitioner for the purpose of issuing medical certificates.

Table 4 gives relevant numbers of deaths by type of certification for 2015 to 2018.

Table 4: Deaths by method of certification and registration England and Wales, 2015 to 2018

	2015		2016		2017		2018	
	Number	%	Number	%	Number	%	Number	%
Total deaths	529,655	100	525,048	100	533,253	100	541,589	100
Certified by doctor:	425,033	80.2	419,178	79.8	433,682	81.3	444,724	82.1
With coroner not involved,	322,550	60.9	315,098	60.0	331,884	62.2	346,065	63.9
without post-mortem, or post mortem information missing.	321,535	60.7	314,177	59.8	330,959	62.1	345,119	63.7
with post-mortem.	1,015	0.2	921	0.2	935	0.2	946	0.2
After referral to coroner,	102,483	19.3	104,080	19.8	101,798	19.1	98,659	18.2
registered with no post-mortem or inquest, or post-mortem information missing.	102,181	19.3	103,744	19.8	101,545	19.0	98,375	18.2
with post-mortem	302	0.1	336	0.1	253	0	284	0.1
Certified by coroner:	103,012	19.4	104,011	19.8	97,569	18.3	94,610	17.5
Coroner's post-mortem held,								
with no inquest	67,619	12.8	63,693	12.1	63,651	11.9	63,713	11.8
Coroner's inquest completed, with or without post-mortem, or post-mortem information missing	34,440	6.5	39,333	7.5	32,789	6.1	29,920	5.5
Coroner's inquest adjourned	952	0.2	984	0.2	1,129	0.2	977	0.2
Uncertified	1,610	0.3	1,859	0.4	2,002	0.4	2,255	0.4

Source: Office for National Statistics

7 . Registration of deaths by declaration

Since April 1997, it has been possible for relatives to provide information about the deceased to a registrar in a different district from that in which the death occurred. This is known as registration of a death by declaration and is similar to the arrangement already in place for births.

The registrar completes a Form 400 ([Annex H](#)), as well as the usual Form 310 ([Annex B](#) or [Annex I](#)) and sends them to a registrar in the district where the death took place; the second registrar then carries out the actual registration.

Between 2010 and 2012, the use of registration by declaration decreased, but has been gradually increasing, with 1% of deaths registered by declaration in 2018.

These are most likely to be infant deaths, especially neonates: about 7% of all neonatal deaths are registered by declaration. Linked to this is the fact that the most common cause for deaths registered by declaration is a congenital anomaly, with around 3% of deaths from such a cause registered in this way in recent years. The greater frequency for infant deaths is explained by the practice of referring infants or pregnant women with serious or unusual health problems to regional care units where appropriate, which may often be some distance from the parents' home address.

8 . Presumption of death

On 1 October 2014, the [Presumption of Death Act 2013 \(PDF, 258KB\)](#) came into force in England and Wales. This means that an application can be made to the High Court for a declaration ([Annex J](#)) 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.

Table 5: Number of presumed deaths
England and Wales, 2014 to 2018

Annual dataset year for registrations	Total deaths	Number of presumed deaths
2018	541,589	18
2017	533,253	21
2016	525,048	18
2015	529,655	16
2014	501,424	0

Source: Office for National Statistics

9 . Cause of death coding

9.1 Coding the underlying cause of death

Automated cause coding

Since 1993, the majority (approximately 80%) of Office for National Statistics (ONS) mortality data have been coded by automatic cause coding software.

Specific text terms from the death certificate are converted to International Classification of Diseases (ICD) codes and then selection and modification rules (see later in this section) are used to assign the underlying cause of death. Using computer algorithms to apply rules increases the consistency and improves the international and temporal comparability of mortality statistics. The cause coding of deaths certified after inquest was done manually by experienced coders as the software could not code the free text format used by coroners.

International Classification of Diseases, Tenth Revision (ICD-10) was introduced in England and Wales in January 2001. Since then various amendments have been authorised by the World Health Organization (WHO). Amendments may (for example) correct errors in the software supporting automatic coding, accommodate new codes in response to new conditions, such as the H1N1 virus (swine flu) or incorporate advances in medical knowledge of the relationship between conditions.

Between 2001 and 2010, ONS used the Mortality Medical Data System (MMDS) ICD-10 version 2001.2 software provided by the United States National Center for Health Statistics (NCHS) to code cause of death. In January 2011, this was updated to version 2010, which incorporated most of the WHO amendments authorised up to 2009.

The main changes in ICD-10 version 2010 were amendments to the modification tables and selection rules. Overall, the impact of these changes is small although some cause groups are affected more than others. For further information, see the [results of the bridge coding study](#). There is also another study looking at the impact on [stillbirths and neonatal deaths](#).

On 1 January 2014, we changed the software used to code cause of death to a package called [IRIS](#) (version 2013). The development of IRIS was supported by Eurostat, the statistical office of the European Union and is now managed by the IRIS Institute hosted by the German Institute of Medical Documentation and Information in Cologne.

IRIS software version 2013 incorporates all official updates to ICD-10 approved by WHO, which were timetabled for implementation before 2014. These updates include changes to the use of codes within the neoplasms (cancer) chapter (ICD-10 codes C00 to D48). In addition a small number of changes were made to the coding of specific conditions, to bring previous coding practice in line with international coding rules and changes were made to the coding of neonatal deaths and stillbirths.

Further [information on IRIS](#) is available. There is also a study that looks into the [impact of the coding changes on stillbirths and neonatal deaths](#).

The death certificate ([Annex A](#)) used in England and Wales is compatible with that recommended by WHO. It is set out in two parts. Part I gives the condition or sequence of conditions leading directly to death, while Part II gives details of any associated conditions that contributed to the death, but are not part of the causal sequence.

The selection of the underlying cause of death is based on ICD rules and is made from the condition or conditions reported by the certifier, as recorded on the certificate. The underlying cause of death is defined by WHO as:

- the disease or injury that initiated the train of events directly leading to death
- the circumstances of the accident or violence that produced the fatal injury

Deaths attributed to accidents, poisonings and violence are examined, firstly according to the underlying cause of death (external cause) and, secondly by the nature of injury, or main injury. External cause of injury codes are taken from Chapter XX of the ICD (prefixes U50.9 and V01 to Y89; where U50.9 is a temporary code and not included in Chapter XX) and nature of injury codes are from Chapter XIX (prefixes S00 to T98), or from a smaller number of other post-procedural codes not within Chapter XIX.

Selection and modification rules

The selection of the underlying cause of death is generally made from the condition or conditions entered in the lowest completed line of Part I of the Medical Certificate of Cause of Death (MCCD). If the death certificate has not been completed correctly – for example, if there is more than one cause on a single line with no indication of sequence, or the conditions entered are not an acceptable causal sequence – it becomes necessary to apply one or more of the selection rules in the ICD-10.

Even where the certificate has been completed properly, there are particular conditions, combinations or circumstances when modification rules have to be applied to select the correct underlying cause of death. On some death certificates, for example, when two or more causes are listed and then linked together, these may point to another cause (not mentioned directly on the certificate) as underlying. Cases of “inferred” underlying causes are few though and are most commonly related to diseases of the circulatory system and late effects of cerebrovascular disease. In other cases the underlying cause of death can be selected from Part II of the MCCD.

In summary, the purpose behind the selection and modification rules is to derive the most useful information from the death certificate and to do it uniformly so that:

- data will be comparable between places and times
- each death certificate produces one, and only one, underlying cause of death

Routine ONS mortality tables analyse the underlying cause of death. Coding rules ensure that each recorded item on the certificate is coded independently of all others on the same certificate. All mentioned causes have been coded routinely since 1993.

ICD-10 implementation

ICD-10 was implemented in England and Wales in 2001. The main differences between ICD-9 and ICD-10 are outlined in [Results of the ICD-10 bridge coding study, England and Wales, 1999](#):

- a change in the format of the code and expansion in the number of codes used
- a movement of some diseases and conditions between broad groups or ICD chapters
- changes to the rules governing the selection of the underlying cause of death, especially Rule 3, which had a large effect

The vast majority of deaths in ICD-9 remained in comparable chapters in ICD-10. However, there were some discontinuities in the data due to the application of new rules for assigning underlying cause in ICD-10, most notably for deaths due to pneumonia. Section 16.4 provides further details about sources of information on the changes to ICD-10.

Historically, the rule that changed cause of death statistics most was the introduction of Rule 3 (see Section 16.3 for further details). In ICD-10 the list of conditions affected by Rule 3 is more clearly defined than in ICD-9 and is also broader in scope.

Deaths from 1979 to 2000, which appear in tables containing historical data, are coded to ICD-9 and have been grouped to reflect ICD-10 categories. To achieve this broad comparability, the ranges of ICD-9 codes used for some of the groupings differ from those published in annual volumes prior to 2001. Particular causes affected include leukaemia, diseases of the liver and land transport accidents.

Note on coding of acute rheumatic fever (ICD-9 390 to 392, ICD-10 I00 to I02)

In 1999, we found that, in some circumstances, deaths from rheumatic and valvular heart diseases were wrongly coded to acute rheumatic fever by the automated cause coding system introduced in 1993. All deaths in 1998 and 1999 with any mention of acute rheumatic fever were checked and recoded manually if necessary. From 2000, routine checks were set in place to correct any deaths miscoded to acute rheumatic fever. Therefore, published data on deaths between 1993 and 1997 assigned to acute rheumatic fever should be regarded as highly unreliable.

Note on coding influenza due to identified avian or swine influenza virus (ICD-10 J09)

Following guidance from the World Health Organization (WHO), the ICD-10 code J09 "Influenza due to identified avian influenza virus" has been used to record H1N1 swine influenza. For ease of use, J09 has been renamed to "Influenza due to identified avian or swine influenza virus" in the mortality tables since 2009.

The number of deaths with an underlying cause of "Influenza due to identified avian or swine influenza virus" (J09) differ from figures reported by [Public Health England](#) (PHE).

9.2 Two codes for certain conditions

The “dagger and asterisk” system

ICD-10 has continued the system introduced in ICD-9 whereby there are two codes for diagnostic descriptions that contain information about both an underlying generalised disease and a local manifestation in a particular organ or site that is a clinical problem in its own right.

In such cases the underlying disease is given a dagger (†) code and the manifestation an asterisk (*) code. Conditions with dagger codes are used in assigning underlying causes. Conditions with asterisk codes are never used in this way so will not appear in tables.

Secondary causes

Deaths where the underlying cause is assigned to an external cause (ICD-10 Chapter XX, U50.9 to Y89) are also assigned at least one nature of injury code (Chapter XIX, S00 to T98) or a post-procedural code not within Chapter XIX. This means it is possible to have more than one nature of injury code for a single death.

For example, a car occupant injured in a transport accident (V40 to V49) may have suffered a fracture to the skull (S02) and femur (S72), as well as injuries of the spleen (S36). However, it is necessary to select which one of the nature of injury codes is to be identified as the one causing death. This one cause code is referred to by ONS as the secondary cause. To do this, WHO provides guidelines or “rules” to ensure that the most useful information is derived from the death certificate and that it is done uniformly.

The move from ICD-9 to ICD-10 had an impact on the allocation of secondary causes. ONS published an [assessment of this impact](#).

In ICD-10, when more than one body region is involved, coding is made to the relevant category of injuries involving multiple body regions (T00 to T07). Therefore, in the previous example of an occupant injured in a transport accident, under ICD-10 the secondary cause would be classified as “other specified injuries involving multiple body regions” (T06.8), whereas under ICD-9 the secondary cause would be more specifically classified as a fracture of the skull (ICD-9 800).

An update by WHO was implemented for 2014 data whereby, if more than one serious injury is reported on the relevant part of the certificate, the main injury must be selected from the [Priority Ranking of ICD-10 Nature-of-Injury Codes \(PDF, 554KB\)](#) list. The update indicates that when more than one of the serious injuries reported in the relevant part of the certificate have the same and highest rank, select the first mentioned of these injuries; however, prefer a specific injury over an injury from the block T00 to T07 (injuries involving multiple body regions) with the same priority rank.

Information on injuries is derived from the coroners’ forms that are supplied to ONS, in particular the coroner’s certificate of cause of death after inquest (Form 99 (Rev) A – [Annex C](#)). This form was revised in May 1993 to bring it into line with the MCCD and with WHO recommendations.

Because the revised form no longer includes specific questions about type of injury and parts of body injured, some coroners now often provide less detail than before. The result is that some deaths are assigned to residual codes for nature of injury. For example, in ICD-10 the statement “head injury” is coded to “unspecified injury of head” (S09.9), whereas with more detail it might be assigned to “fracture of skull and facial bones” (S02.n).

9.3 Final cause of death

The conditions mentioned on the death certificate are used to derive an underlying cause of death. In some cases, more information on cause of death may become available at a later stage after the death has been registered, such that the underlying cause may be subsequently amended.

Around 0.1% of deaths have their underlying cause amended (Table 6). This amended or final cause is used in mortality statistics. Sometimes the later information becomes available only after the annual extract has been taken. Users with access to individual records of deaths as shown in the public record (which is never amended) may consequently find some differences with published statistics.

Table 6: Number of deaths where original cause was amended for final cause, England and Wales, 2018

Deaths Per cent Analysis

8	0.00~	Original 'Diseases of the respiratory system' cause amended for final cause
5	0.00~	Original 'Neoplasm' cause amended for final cause
10	0.00~	Original 'Diseases of the circulatory system' cause amended for final cause
9	0.00~	Other original cause amended for final cause
23	0	3-digit ICD-10 codes for original and final cause match
179	0	4-digit ICD-10 codes for original and final cause match
435	0.1	'Pending conclusion' deaths resolved and final cause submitted
540,245	99.9	No final cause information submitted (includes neonatal deaths)

Source: Office for National Statistics

In summary, further details on the causes of death can be obtained in one or other of the following ways.

Deaths certified by doctors may have their cause amended as a result of a post-mortem, or of tests initiated before death. The certifier sends this additional information directly to the cause coding team at ONS, where it is only used for statistical purposes and does not appear in the public record.

Less than 1% of deaths certified by a doctor have a post-mortem and in the majority of cases, the certified cause remains unchanged. In addition, ONS cause coders may contact the certifier for more information if the certificate is unclear or they cannot code the underlying cause; this is very rare.

When a death has been certified by a coroner after post-mortem (with no inquest), further information may be available once they have results of bacteriology or histopathology. This is also very rare.

Following an inquest, coroners may submit to ONS details of how a fatal accident occurred. This is rare, as coroners normally only certify the cause of death after their investigations are complete, so the first and only information ONS receives about these deaths is the final underlying cause.

Coroners may also provide a final underlying cause of death and conclusion much later for an accelerated registration following an adjourned inquest (see Section 9.4).

9.4 Accelerated registrations

On 1 January 1978, certain provisions of the [Criminal Law Act 1977](#), the [Coroners \(Amendment\) Rules 1977](#) and the [Registration of Births, Deaths and Marriages \(Amendment\) Regulations 1977](#) came into force. There were two principal changes arising from the legislation.

Firstly, the duty of a coroner's jury to name a person it finds guilty of causing a death and of a coroner to commit that person for trial, was abolished.

Secondly, in cases where there was an inquest adjournment, provision was made for the death to be registered at the time of adjournment instead of having to await the outcome of criminal proceedings, as previously. This provision is referred to as accelerated registration.

Accelerated registrations that are not transport incidents are assigned to code U50.9 (event awaiting determination of event) for events registered from 1 January 2007, or to code Y33.9 (other specified events, undetermined intent) for events registered up to the end of 2006. Most of these are eventually reassigned to assault (X85 to Y09), but the delays before this happens can affect the published figures in the under-estimation of deaths from assault ([Death certification and the epidemiologist](#)).

Accelerated registrations related to deaths involving motor vehicle incidents are assigned to a code in the range V01 to V89 (land transport accidents) if sufficient information is available on the coroner's certificate of adjournment.

9.5 Assault and intentional self-harm

Numbers of deaths from assault (homicide in ICD-9)

It is possible to make alternative assessments about the number of deaths that may be attributed to assault. The two estimates presented in standard tables are:

- the number coded to X85 to Y09; this is the basic ICD classification to which all assaults should eventually be assigned
- the number coded to X85 to Y09, plus those coded to U50.9 (event awaiting determination of intent); this takes account of accelerated registrations, most of which are eventually coded to an assault code (see Section 9.4)

Numbers of deaths from intentional self-harm (suicide in ICD-9)

As with assault, it is possible to make two separate estimates of the number of deaths annually from intentional self-harm:

- the number coded to X60 to X84; this is the basic ICD classification to which all definite intentional self-harm conclusions are assigned
- the number coded to X60 to X84, plus those coded to Y10 to Y34 (event of undetermined intent); this takes account of most deaths where an open inquest conclusion was returned, but excludes all deaths that are pending investigation

For more information on the suicides definition please see the [Suicides in the UK](#) statistical bulletin.

10 . ONS short list of cause of death

The cause of death codes shown in detailed cause of death tables are those where at least one death was coded to that underlying cause during the relevant reference period.

The Office for National Statistics (ONS) short list for cause of death is based on a standard tabulation list developed by ONS, in consultation with the Department of Health. This list of over 100 conditions was based on the following:

- all conditions given in the World Health Organization (WHO) basic tabulation list; with the exception of a few conditions that are so rare as certified causes of death in England and Wales that they could safely be excluded from the list
- totals for each International Classification of Diseases, Tenth Revision (ICD-10) chapter
- conditions used in monitoring public health targets
- other conditions often cited by ONS

The aim was to provide a standard listing for tables of mortality statistics containing conditions frequently referred to by all users of the data. In this way, users could find the same conditions in different tables and in different annual publications.

Many tables also contain statistics for conditions in the standard list as well as others of particular interest. The standard listing is given in the following table. Note that from 1993 to 2000, conditions related to HIV infection were coded to ICD-9 042 to 044. This replaced the previously used ICD-9 code of 279.1 (deficiency of cell-mediated immunity) for these conditions. From 2001, conditions related to HIV infection have been coded to the ICD-10 codes B20 to B24.

From 1 January 2007, a new ICD-10 code (U50.9) has been used by ONS for deaths involving adjourned inquests that would previously have been coded to Y33.9. This has made the tabulation of deaths from undetermined intent, and estimates of suicide, easier to produce.

ONS short list of cause of death codes, using ICD-10

ICD-10 codes Cause of death names

A00–R99, U00–Y89	All causes
A00–B99	I Certain infectious and parasitic diseases
A00–A09	Intestinal infectious diseases
A15–A16	Respiratory tuberculosis
A17–A19	Other tuberculosis
A39	Meningococcal infection
A40–A41	Sepsis
B15–B19	Viral hepatitis
B20–B24	Human immunodeficiency virus [HIV] disease
B90	Sequelae of tuberculosis
C00–D48	II Neoplasms
C00–C97	Malignant neoplasms
C00–C14	Malignant neoplasms of lip, oral cavity and pharynx
C15	Malignant neoplasm of oesophagus
C16	Malignant neoplasm of stomach
C18	Malignant neoplasm of colon
C19–C21	Malignant neoplasm of rectosigmoid junction, rectum and anus
C22	Malignant neoplasm of liver and intrahepatic bile ducts
C23–C24	Malignant neoplasm of gallbladder and biliary tract
C25	Malignant neoplasm of pancreas
C32	Malignant neoplasm of larynx
C33–C34	Malignant neoplasm of trachea, bronchus and lung
C43	Malignant melanoma of skin
C44	Other malignant neoplasms of skin
C45	Mesothelioma
C46	Kaposi sarcoma
C50	Malignant neoplasm of breast
C53	Malignant neoplasm of cervix uteri
C54–C55	Malignant neoplasm of other and unspecified parts of uterus
C56	Malignant neoplasm of ovary
C61	Malignant neoplasm of prostate
C62	Malignant neoplasm of testis
C64	Malignant neoplasm of kidney, except renal pelvis
C67	Malignant neoplasm of bladder
C71	Malignant neoplasm of brain

C81	Hodgkin lymphoma
C82–C85	Non-Hodgkin lymphoma
C90	Multiple myeloma and malignant plasma cell neoplasms
C91–C95	Leukaemia
C97	Malignant neoplasms of independent (primary) multiple sites
D00–D48	In situ and benign neoplasms, and neoplasms of uncertain or unknown behaviour
D50–D89	III Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism
D50–D64	Anaemias
E00–E90	IV Endocrine, nutritional and metabolic diseases
E10–E14	Diabetes mellitus
F00–F99	V Mental and behavioural disorders
F01, F03	Vascular and unspecified dementia
F10–F19	Mental and behavioural disorders due to psychoactive substance use
G00–G99	VI Diseases of the nervous system
G00, G03	Meningitis (excluding meningococcal)
G12.2	Motor neuron disease
G20	Parkinson disease
G30	Alzheimer disease
G35	Multiple sclerosis
G40	Epilepsy
H00–H59	VII Diseases of the eye and adnexa
H60–H95	VIII Diseases of the ear and mastoid process
I00–I99	IX Diseases of the circulatory system
I05–I09	Chronic rheumatic heart diseases
I10–I15	Hypertensive diseases
I20–I25	Ischaemic heart diseases
I21–I22	Acute myocardial infarction
I26–I51	Other heart diseases
I60–I69	Cerebrovascular diseases
I60–I62	Intracranial haemorrhage
I63	Cerebral infarction
I64	Stroke, not specified as haemorrhage or infarction
I70	Atherosclerosis

I71	Aortic aneurysm and dissection
J00–J99	X Diseases of the respiratory system
J09	Influenza due to certain identified influenza virus
J10–J11	Influenza
J12–J18	Pneumonia
J40–J44	Bronchitis, emphysema and other chronic obstructive pulmonary disease
J45–J46	Asthma
K00–K93	XI Diseases of the digestive system
K25–K27	Gastric and duodenal ulcer
K40–K46	Hernia
K57	Diverticular disease of intestine
K70–K77	Diseases of the liver
L00–L99	XII Diseases of the skin and subcutaneous tissue
M00–M99	XIII Diseases of the musculoskeletal system and connective tissue
M05-M06, M08	Rheumatoid arthritis and juvenile arthritis
M80–M81	Osteoporosis
N00–N99	XIV Diseases of the genitourinary system
N00–N15	Glomerular and renal tubulo-interstitial diseases
N17–N19	Renal failure
N40	Hyperplasia of prostate
O00–O99	XV Pregnancy, childbirth and the puerperium
P00–P96	XVI Certain conditions originating in the perinatal period
Q00–Q99	XVII Congenital malformations, deformations and chromosomal abnormalities
Q20–Q28	Congenital malformations of the circulatory system
R00–R99	XVIII Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified
R54	Senility
R95	Sudden infant death syndrome
R99	Other ill-defined and unspecified causes of mortality
S00–T98	XIX Injury, poisoning and certain other consequences of external causes
S00–S19	Injuries to the head and the neck

S20–S29	Injuries to the thorax
S30–S39	Injuries to the abdomen, lower back, lumbar spine and pelvis
S72	Fracture of femur
T20–T32	Burns and corrosions
T39.1	Poisoning by 4-Aminophenol derivatives
T40	Poisoning by narcotics and psychodysleptics [hallucinogens]
T42	Poisoning by antiepileptic, sedative-hypnotic and antiparkinsonism drugs
T43	Poisoning by psychotropic drugs, not elsewhere classified
T50.9	Poisoning by other and unspecified drugs, medicaments and biological substances
T51–T65	Toxic effects of substances chiefly nonmedicinal as to source
T58	Toxic effect of carbon monoxide
T71	Asphyxiation
T75.1	Drowning and nonfatal submersion
V01–Y89 (inc U50.9)	XX External causes of morbidity and mortality
V01–X59	Accidents
V01–V99, Y85	Transport accidents
V01–V89	Land transport accidents
W00–W19	Falls
W65–W74	Accidental drowning and submersion
X00–X09	Exposure to smoke, fire and flames
X40–X49	Accidental poisoning by and exposure to noxious substances
X41	Accidental poisoning by and exposure to antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified
X42	Accidental poisoning by and exposure to narcotics and psychodysleptics [hallucinogens], not elsewhere classified
X44	Accidental poisoning by and exposure to other and unspecified drugs, medicaments and biological substances
X59	Accidental exposure to unspecified factor
X60–X84	Intentional self-harm
X85–Y09	Assault
Y10–Y34	Event of undetermined intent
X60–X84, Y10–Y341	Intentional self-harm; and event of undetermined intent
U50.9, X85–Y091	Assault; death from injury or poisoning, event awaiting determination of intent (inquest adjourned)

Source: Office for National Statistics

Notes

1. The production of statistics on numbers of assault and intentional self-harm deaths occurring in a particular year is complicated by matters of definition and delay resulting from legal proceedings. Further details can be found in Section 9.5. [Back to table](#)

11 . Childhood mortality

11.1 Stillbirths

The [Stillbirth \(Definition\) Act 1992](#) defines a stillbirth as, “a child which has issued forth from its mother after the 24th week of pregnancy, and which did not at anytime after becoming completely expelled from its mother breathe or show other signs of life”.

This definition has been in use since 1 October 1992. Prior to this, the [Births and Deaths Registration Act 1953](#) defined a stillbirth as previous, but at 28 or more weeks completed gestation. Figures for stillbirths from 1993 are, therefore, not comparable with those for previous years. From 28 May 2012, the restriction to register a stillbirth within three months from the date of occurrence has been removed and stillbirths can be registered at any time.

11.2 Infant deaths

Infant deaths (under one year) at various ages are defined as:

- early neonatal – deaths under seven days
- perinatal – stillbirths and early neonatal deaths
- neonatal – deaths under 28 days
- postneonatal – deaths between 28 days and one year

Linked data refers to infant death records that have been successfully matched to their corresponding birth record; see the annual publications [Child mortality statistics](#), [infant mortality \(birth cohort\) tables](#) and [Unexplained deaths in infancy](#) for further details.

11.3 Neonatal deaths

The tabulations of deaths by cause exclude neonatal deaths (deaths of infants aged under 28 days). In January 1986, a neonatal death certificate was introduced, from which it is not possible to assign an underlying cause of death. This certificate follows recommendations of the World Health Organization (WHO) in the International Classification of Diseases (ICD) (WHO, 1992 to 1994), whereby causes of death are given separately in the following categories:

- main diseases or conditions in fetus or infant
- other diseases or conditions in fetus or infant
- main maternal diseases or conditions affecting fetus or infant
- other maternal diseases or conditions affecting fetus or infant
- other relevant causes

While conditions arising in the mother that affected the fetus or infant could be mentioned on certificates prior to 1986, no provision was made for those cases in which the certifier considered that both maternal and fetal conditions contributed to the death. The certificate introduced in 1986 overcame this problem. However, since equal weighting is now given to main conditions in the fetus and in the mother, it is no longer possible to identify a single underlying cause of death for neonatal deaths (and stillbirths).

For this reason Office for National Statistics (ONS), together with a team of experts in the field, developed a hierarchical classification for classifying causes of neonatal deaths and stillbirths in ICD-10. This classification is known as “ONS cause groups”. More details can be found in [Health Statistics Quarterly](#) and the latest [Child mortality statistics publication](#).

12 . Quality of mortality data

Mortality statistics in England and Wales are derived from the registration of deaths certified by a doctor or a coroner. The data pass through a number of processes ([Annex K](#)) before becoming usable for analysis. These processes are complex and involve a wide range of people, organisations and computer systems.

To produce mortality outputs, annual extracts are taken from the deaths database. These extracts are then used to produce annual tables and files of individual death records for other government departments and health authorities, as provided for by relevant legislation.

13 . Registration of deaths

13.1 Completing medical certificates of cause of death

For around three-quarters of deaths, one of the doctors involved in the patient’s care for the illness from which they died completes a Medical Certificate of Cause of Death (MCCD). Many thousands of general practitioners (GPs), hospital consultants, junior doctors in training and doctors in other clinical posts all complete MCCDs.

The nature and amount of training they have had in death certification vary greatly. Not all medical schools in the UK include questions on death certification in their exams. However, “issuing death certificates” is included as a competency that newly qualified doctors should be able to demonstrate during their training in Foundation Years 1 and 2.

Doctors already in practice are required to keep their knowledge and skills up-to-date through continuous professional education. However, there are constant changes in clinical knowledge, practice and guidelines to keep abreast of, so death certification may not often be a priority.

Training materials on death certification developed by Office for National Statistics (ONS) in the late 1990s with the help and oversight of a wide range of stakeholders through the ONS Death Certification Advisory Group (DCAG) in the 1990s are available from our Titchfield office (see Section 1 for contact details). These include a short video, "Death Counts", an associated training pack including test histories and pocket cards for distribution to GPs and hospital doctors.

There have been several well-publicised proposals for reform of death certification since the Shipman case in 1998. Legislation implementing the reform of the process of death certification in England and Wales is included in the [Coroners and Justice Act 2009](#), which received Royal Assent on 12 November 2009. This will reform the process of death certification by introducing a single unified system for both burials and cremations and appointing medical examiners to provide an independent scrutiny of the cause of death.

Guidance to doctors completing MCCDs in England and Wales was updated by the ONS DCAG in June 2005 and again in November 2007. The guidance explains best practice under current legislation and sets out numerous examples based on recent queries from certifiers and samples of good certification.

In 2005, the Department of Health (DH) notified all registered doctors of the existence of the new guidance through Chief Medical Officer's (CMO) Update (CMO 2005). In 2007, the CMO again drew the attention of doctors and senior NHS managers to the guidance in a letter about deaths involving healthcare-associated infections.

Guidance is given to doctors completing MCCDs in England and Wales by DH under the Coroner and Justice Act 2009 and new guidance will be issued by DH following the implementation of the planned reforms. This guidance will be agreed by DH, ONS, General Register Office (GRO) and the National Medical Examiner when appointed.

Coroners certify about a quarter of all deaths. Coroners can only certify cause of death following a post-mortem by a pathologist, an inquest or both. Training for coroners is organised through the Ministry of Justice. The process of referral to a coroner and how referred deaths are dealt with varies between coroners' areas.

13.2 Registration of the death

Data items other than the cause of death depend largely on information supplied by the informant. For deaths certified after inquest, police officers or other witnesses may supply this information, which cannot later be checked by the registrar. For some items of information, for example, occupation, there may be no absolute way of checking its accuracy. For others, validity (age and date of birth), or "reasonableness" (age and cause of death) may be checked. Some details may also be verified later, for example, date of birth, with records held at health service data sources.

13.3 Entry of data

Registration Service Software (RSS)

RSS was rewritten in 1998 and issued to Register Offices in 1999. It was replaced by the Registration Online (RON) system on 1 July 2009. The deaths statistical fields used in RSS were validated in three respects:

- range: checking that codes fall into an expected range of values
- data type: checking that text appears where it should and numeric values appear where they should
- logic: cross-checking with values in one or more other fields

Cross-validations are carried out by checking logical consistency between various items recorded by the registrar. These include information collected on type of certification, referral to coroner, and whether a post-mortem was carried out.

Registration Online (RON)

In November 2006, a pilot for an online system of registering life events (RON) commenced in five registration districts. Following the success of this pilot, RON was implemented in most register offices on 26 March 2007. However, as a result of significant performance problems, the system was suspended on 10 April 2007 resulting in around half of registrars reverting back to using the previous electronic system, RSS.

From 8 May 2007, almost all register offices were submitting data electronically using either RON or RSS. Any remaining death registrations that were held only on paper at register offices were later entered onto the RON system by the General Register Office (GRO), or by the local registration service. RON was fully implemented in register offices on 1 July 2009.

13.4 Other checks made by the Registration Service

Checks are also made on death registration details at various times by registrars, superintendent registrars and account managers from GRO.

At the time of registration

When someone attends to register a death, the registrar is instructed to make the following checks:

- a medical certificate (coroner's document) is presented
- the death is in their area
- the death occurred within the last 12 months
- the informant is qualified to give information
- the correct medical certificate has been used
- the certificate relates to the correct person
- the certificate has been filled in properly – that is, it is signed, not amended in any way, the doctor's qualifications filled in, the last date seen alive and whether or not the certifier saw the deceased after death is shown
- the death does not need to be referred to the coroner

The registrar then carries out the registration and reviews the recorded detail with the informant before the register page is signed by the informant and registrar. The signed register page is normally a computer-generated print, replicating the detail held on computer, but when the computerised system is unavailable it is a handwritten page.

By superintendent registrars and account managers

Superintendent registrars carry out the following quarterly checks:

- the Quarterly Certified Copy (QCC) entries agree with each register entry
- the entries appear to be in sequence
- there is a medical certificate or coroner's form to accompany each death entry, as appropriate
- each entry has been signed by an informant (if required) and by the registrar
- for any manual entries a general check on any apparent erasure or illegibility

Account managers visit registration districts on a periodic basis and as part of the process will typically include the following inspection activity:

- sitting in on actual registrations to check questioning technique
- examining a sample of register entries and supporting documentation and draft entries
- examination of computerised records held

14 . Checking and validation of registration data at ONS Titchfield

14.1 Receipt of death registration data at Office for National Statistics (ONS) Titchfield office

Details of deaths are received from register offices electronically. Routine and automated checks are carried out on each file and the combined data are then loaded on to the deaths database. Regular receipt and diagnostic reports are produced, resulting in weekly contacts with the identified registrars to resolve any problems.

Examples of checks include:

- identification of missing entries, so that death registration details are received in sequence
- checks for duplicate records
- checking for misplaced records, for example, verifying that each registrar is using the register allocated
- for paper records – that date of death and date of registration are in the correct range
- for paper records – records are checked for completeness prior to keying
- checks on registrars whose returns have not been received by the fourth working day after the end of each week

14.2. Validation processes

Once on the database, the data are passed through a series of validation processes which are carried out automatically with any inconsistencies highlighted. Simple validations include examination of dates or employment status to ensure that they are likely. More complicated validations include checks for consistency between dates of birth, death and registration, or between age and marital status.

14.3 Routine checks in Titchfield

All deaths accepted onto the database that need routine coding are identified and coded as required by the Life Events Processing Branch (LEP). The detailed routine coding falls into five main areas:

- postcoding to give usual residence of deceased
- occupation, that is, the occupation of deceased, spouse, civil partner, where age of deceased is over 16 years (last occupation if retired); the occupation of the mother and/or father, where age of deceased is under 16 years
- communal establishment coding for place of death of deceased
- place of birth of deceased
- cause of death (see following checks)

Routine automated and manual checks of cause of death data are carried out on all records on a monthly basis. These include:

- checking cause fields against inquest conclusion fields for compatibility
- the presence or absence of original and final cause of death fields
- codes for ONS cause groups are present for neonatal deaths and absent for non-neonatal deaths (see Section 11.3)
- validity of suicides at very young ages
- mentioned conditions on death certificate are compatible with sex
- the derived underlying cause of death is mentioned in Part I or Part II of the death certificate

Once coding of the cause of death is complete, checks are carried out on variables such as date of death, sex, year of birth, marital status and communal establishments. These checks evolve continuously during exploratory surveillance of data quality and some of these are later incorporated as routine checks.

14.4 Automated cause coding

Automated cause coding (see Section 9.1) is used to derive codes for each medical condition on the certificate and to identify the underlying cause. The accuracy of automated coding is checked regularly within data quality check requirements. Periodical reports on persistent coding problems are referred to a medical epidemiologist and authors of the software to highlight areas of concern for the new releases.

14.5 Checks before and after extraction of data for analysis

The first of these are carried out as a final check of what is held on the deaths database before an annual extract of data is taken. These comprise frequency checks for a range of fields, covering age, sex, underlying cause and area of residence. Also checked are possibly incorrect combinations of fields. Any apparent errors or inconsistencies result in checks of individual cases by coders who make amendments, as required. Some of these checks are also carried out routinely every month.

Further examinations are carried out once the data extract has been taken. They include checks similar to those done before extraction, to ensure that corrections made at that stage were properly carried out. After the annual extract used for mortality analyses has been produced, a further set of frequency counts and two-way tables are prepared to ensure that no new errors have been introduced. These checks are to ensure that the frequency distributions are both valid and plausible and broadly similar to those for the previous year's data.

14.6 Checks on routine outputs

These include:

- systematic checks of totals (row, column, and other) against known correct figures
- checks of individual cells against correct figures
- checking figures are consistent and plausible, that is, that they are what would be expected compared with the previous year's tables

These checks are carried out by the Mortality Data Management Team in ONS's Life Events Processing Branch.

15 . Death rates, ratios and standardisation

Death rates are derived from total deaths registered in England and Wales in the specific calendar year and corresponding mid-year population estimates.

Rates are not calculated where there are fewer than three deaths in a cell, denoted by (u). It is Office for National Statistics (ONS) practice not to calculate rates where there are fewer than three deaths in a cell, as rates based on such low numbers are susceptible to inaccurate interpretation.

Rates that are based on between 3 and 19 deaths are displayed in tables but are denoted by (u) as a warning to the user that their reliability as a measure may be affected by the small number of events.

Prior to July 2014, rates were not calculated where there were fewer than three deaths in a cell, denoted by (:). Rates in tables calculated from between 3 and 19 deaths were distinguished by italic type.

15.1 Crude death rate

Crude death rate is defined as total deaths per 1,000 population, or:

(Total deaths divided by Total population) multiplied by 1,000

15.2 Age-specific death rates

Age-specific death rates may be calculated for each age group. These are defined as the number of deaths in the age group per 1,000 population in the same age group, or:

$M_k = (d_k \text{ divided by } p_k) \text{ multiplied by } 1,000$

where

M_k = age-specific death rate for age group k

d_k = deaths in age group k

p_k = population in age group k (mid-year population estimates with the exception for the rate for those aged under 1 year old where the number of live births are used instead)

k = age

Age-specific rates may be calculated separately for males and females, or for both sexes combined.

15.3 Age-standardised mortality rates (ASMRs)

Age-standardised mortality rates (ASMRs) allow for differences in the age structure of populations and therefore allow valid comparisons to be made between geographic areas, over time and between sexes. Using the direct method, the age-standardised rate for a particular condition is that which would have occurred if the observed age-specific rates for the condition had applied in a given standard population.

Thus:

$$\text{age-standardised rate} = \left\{ \sum P_k m_k \right\} \text{ divided by } \sum P_k$$

where

P_k = standard population in sex/age group k

m_k = observed mortality rate (deaths per million persons) in sex/age group k (mid-year population estimates are used to calculate all age-specific rates prior to standardisation)

k = age/sex group 0, 1 to 4, 5 to 9, ..., 85 to 89, 90 years and over

(From the 2015 data year ASMRs are calculated using population estimates for all age groups. Prior to the 2015 data year, the number of live births were used for the population at age under 1 year old. This change has had no significant impact on the rates.)

The age-standardised rate for “all causes” includes deaths at all ages, while the same rates for specific causes exclude neonatal deaths (infants aged under 28 days). Classification by underlying cause is not possible for neonatal deaths (see Section 11.3).

The standard population used is the European Standard Population (ESP); it is the same for both males and females. The ESP is a hypothetical population used to weight ASMRs.

The ESP was originally published in 1976 and was updated by Eurostat in 2013. The 2013 ESP structure allocates a greater weight to older ages to better reflect the ageing population. This change has had a significant impact; consequently ASMRs based on the 1976 ESP are not comparable with those based on the 2013 ESP. Further [information about the change in methods](#) is available.

Distribution of the European Standard Population for 1976 and 2013

Age	1976 ESP ¹	2013 ESP ²
Under 1	1,600	1,000
01 to 04	6,400	4,000
05 to 09	7,000	5,500
10 to 14	7,000	5,500
15 to 19	7,000	5,500
20 to 24	7,000	6,000
25 to 29	7,000	6,000
30 to 34	7,000	6,500
35 to 39	7,000	7,000
40 to 44	7,000	7,000
45 to 49	7,000	7,000
50 to 54	7,000	7,000
55 to 59	6,000	6,500
60 to 64	5,000	6,000
65 to 69	4,000	5,500
70 to 74	3,000	5,000
75 to 79	2,000	4,000
80 to 84	1,000	2,500
85 and over	1,000	z
85 to 89	z	1,500
90 to 94	z	800
95 and over	z	200
Total	100,000	100,000

Source:

1. Revision of the European Standard Population: Report of Eurostat's task force, Eurostat.

2. Revised European Standard Population 2013 (2013 ESP), Office for National Statistics.

For National Statistics publication of mortality and cancer incidence, ONS is currently using an abridged ESP with a 90 years and over upper age band. National Statistics population estimates are only currently available for upper age limit of 90 years and over.

15.4 Perinatal mortality rate

Perinatal mortality rate is the number of deaths at ages under seven days (early neonatal deaths) plus stillbirths per 1,000 live births and stillbirths in the same period.

15.5 Infant mortality rate

Infant mortality rate is the number of deaths at ages under one year per 1,000 live births.

15.6 Standardised mortality ratios (SMRs)

Standardised mortality ratios (SMRs) compare mortality in one population with mortality in a “standard” population, while allowing for differences in age structure. Using the indirect method, the ratio is of “observed” to “expected” deaths. “Expected” deaths are the number that would have occurred if the sex and age-specific mortality rates of the standard year had applied to the population of interest.

SMRs for males and females separately are calculated using the appropriate sex- and age-specific standard rates. For persons, the SMRs are based on age-specific standard rates for males and females combined.

Thus: SMR equals (observed deaths divided by expected deaths) multiplied by 100

where

$$\text{expected deaths} = \sum P_k M_k$$

and

P_k = population in age/sex group k in population of interest (for example, an area, or period of time)

M_k = age-specific death rate for age group k for the standard population

k = age group (various groupings – see the following)

Unless otherwise stated, the standard mortality rates used are based on the most recent population estimates for England and Wales and the age groups used in the calculation are 0, 1 to 4 years, 5 to 9 years, 10 to 14 years, ..., 80 to 84 years, 85 years and over.

15.7 Years of life lost

Analyses of the effects of premature death assume that everyone may live to a defined age and that death at a younger age means that some future years of life have been lost. Calculations of years of life lost are made for deaths from selected causes with the aim of illustrating the relative effects from different diseases.

The “cut-off” ages used are 65, 75 and 85 years. These exclude deaths at high ages where the cause may be uncertain. This approach, but with a “cut-off” age of 65 years, is also used to calculate years of working life lost due to premature death.

From 2012 data year onwards, the period of working life covers ages 16 to 64 years for both males and females. Prior to 2012 data year, the period of working life covered ages 15 to 64 years. This change has a negligible impact on the comparability of statistics over time.

$$\text{Total years of life lost} = \sum (A - a_i) d_i$$

$$\text{Years of working life lost} = \left[\sum (65 - a_j) d_j \right] + 49 \sum d_k$$

where

d_i, d_j, d_k = number of deaths in age group $i/j/k$

a_i, a_j, a_k = age $i/j/k + 0.5$

A = 65 years or 75 years or 85 years

i = 0 to 64 years or 0 to 74 years or 0 to 84 years

j = 16 to 64 years

k = 0 to 15 years

Since there is no information on underlying cause of death when the deceased was aged under 28 days, the only category including both neonatal and non-neonatal deaths is that for “all causes”.

The mean age at death may be included as a further indicator of the relative effects of premature death. It is based on the sum of ages at death for each person.

$$\text{Mean age at death} = \frac{\sum (a_i d_i)}{d}$$

where

a_i = age + 0.5

d_i = number of deaths at age i

i = single years of age 0 to 119, 120 and over

d = total number of deaths

15.8 Potential years of life lost

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 of PYLL is that deaths at younger ages are weighted more heavily than those at older ages. The advantage in doing this is that deaths at younger ages may be seen as less important if cause-specific death rates were just used on their own in highlighting the burden of disease and injury, since conditions such as cancer and heart disease usually 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 European Standard Population (ESP). SYLL rates are presented as years of life lost per 100,000 population.

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 as shown in the equation:

$$SYLL = \frac{\sum_i \left(w_i \frac{a_i d_i}{n_i} \right)}{\sum_i w_i} \times 100,000$$

where:

i = age group (less than 1 year, 1 to 4 years, 5 to 9 years, 10 to 14 years, ..., 85 to 89 years, 90 years and over)

d_i = number of deaths in age group i

a_i = weight, or average age-specific period life expectancy in age group i for a given year

n_i = population in age group i

w_i = number of individuals in the standard population in age group i

16 . Background and history of mortality data

16.1 Redevelopment of mortality statistics

In the early 1990s, there was an extensive redevelopment of collection and processing systems for population, health and registration data – in particular, for births and deaths. For deaths this included: the progressive computerisation of registration in local offices, the move to a large deaths database to hold all deaths data from 1993 and the introduction of automated coding of cause of death.

Further information about these changes follows, with more details in the annual volume in the [DH2](#) series for 1993 and 1994. Changes to the rules for selecting and coding cause of death brought England and Wales into line with international practice in 1993.

16.2 The deaths databases

In the deaths processing system that has been used within Office for National Statistics (ONS) since the early 1990s, there are two deaths databases, one for register information and the other for statistical data.

The registration database contains mainly textual information that appears on the death certificate. This corresponds to most of the details supplied by informants to a registrar, available to applicants requesting a copy of the death certificate.

The deaths statistical database contains only coded details of each death. When outputs are required, the statistical database can supply information on individual deaths or provide datasets for tabulation. The statistical database is continually updated and amended as further information becomes available.

In 1999, we developed a database to facilitate research into deaths related to drug poisoning and to aid the identification of specific substances involved in these deaths. The database currently contains data on all deaths on the annual data files for England and Wales between 1993 and the latest available year, where the underlying cause of death is regarded as resulting from drug-related poisoning, according to the current [National Statistics definition](#). The database covers accidents and suicides involving drug poisoning, as well as poisonings due to drug abuse and drug dependence, but not other adverse effects of drugs.

16.3 Legislation

The existing provisions for the registration of deaths and the processing, reporting and analysis of mortality data appear in different legislation that reflects the distinct and separate roles of the Registrar General for England and Wales and the UK Statistics Authority.

The Registrar General is guided by the following:

- [Population \(Statistics\) Act 1938](#): deals with the statistical information collected at registration
- [Births and Deaths Registration Act 1953](#): covers all aspects of the registration of births, stillbirths and deaths
- [Population \(Statistics\) Act 1960](#): makes further provision for collecting statistical detail at registration
- [Registration of Births and Deaths Regulations 1987](#): cover further aspects of the registration of births and deaths
- [Coroners Act 1988](#): sets out the procedures to be followed by coroners in handling deaths
- [Stillbirth \(Definition\) Act 1992](#): which altered the definition of a stillbirth to 24 or more weeks completed gestation, instead of the previous definition of 28 or more weeks
- [Deregulation \(Stillbirth and Death Registration\) Order 1996](#): allows for the registration of deaths by declaration
- [National Health Service Act 2006](#) (amended 2013) and [National Health Service \(Wales\) Act 2006](#): consolidate legislation relating to the health service and separate provision of the health service in Wales from that in England; the Acts require notification of a birth or death to the local authority and the clinical commissioning group (local health board in Wales) where the birth or death occurred - both Acts include provision for the supply of information on individual deaths to the National Health Service by the Registrar General
- [Presumption of Death Act 2013](#): application can be made 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

The UK Statistics Authority is guided by the following:

- [Registration Service Act 1953](#): which in Section 19 required the Registrar General to produce annual abstracts of the number of live births, stillbirths and deaths
- [Statistics and Registration Service Act 2007](#): which transferred some of the statistical functions of the Registrar General, including the production of an annual abstract, to the Statistics Board, also known as the UK Statistics Authority, and Office for National Statistics, which became the executive office of the UK Statistics Authority; the 2007 Act also provides the Registrar General with a power to disclose any information about a birth, death or a stillbirth to the UK Statistics Authority for statistical purposes; it also enables the UK Statistics Authority to produce and publish statistics relating to any matter; the Act also includes a provision for the UK Statistics Authority to supply individual birth and death records to the Secretary of State for Health and certain NHS bodies

When the Statistics and Registration Service Act 2007 came into force on 1 April 2008, the arrangement where the National Statistician was also the Registrar General for England and Wales ended. At the same time, the General Register Office also stopped being part of ONS and was moved to the Identity and Passport Service. The National Health Service Central Register (NHSCR), formerly part of ONS, also transferred to the Health and Social Care Information Centre (HSCIC), which is now known as NHS Digital.

The responsibility for the production of mortality statistics is now a function of the UK Statistics Authority, which is required to produce an annual abstract of mortality statistics in order that the Minister for the Cabinet Office can lay it before Parliament.

16.4 Historical changes in mortality data

Users should note certain changes to the collection and coding of deaths data over the years may affect their interpretation of trends in mortality. These changes include the following:

1979

Introduction of the Ninth Revision of the International Classification of Diseases. This replaced the Eighth Revision, used from 1968 to 1978. A 25% sample of death certificates for 1978 was selected and coded to both the Eighth and Ninth Revisions to give a guide to the effect of these changes on specific categories.

1981 to 1982

Industrial action taken by registration officers affected the quality of information about deaths from injury and poisoning. Details normally supplied by coroners were not available; the statistics were significantly affected. Figures on injury and poisoning for 1981, with the exception of suicides, should be treated with caution. Categories such as “transport accidents” and “homicide” were significantly understated whereas “non-specific accidents” and “undetermined injuries” were overstated. Statistics relating to nature of injury, were less affected by the absence of the coroners’ information. Although industrial action extended into 1982, the coroners’ information was collected retrospectively for that year, enabling more accurate figures to be produced. However, complete details to help code the cause of death were still unavailable in 1982. This resulted in more deaths than usual being assigned to “unspecified” categories.

1984

Our interpretation of World Health Organization (WHO) Rule 3 was amended in the assignment of underlying cause of death. [Series DR for 2006](#) has more detail. It resulted in a decrease in the numbers of deaths coded to pneumonia and a few other causes, and an increase in deaths from many other conditions – most of the latter being small increases. The background to this change is given in the annual volume DH2 number 11 for 1984, which includes a table assessing the numerical effects of changes, by underlying cause. Deaths from injury and poisoning were excluded from this exercise.

1986

Since January 1986, registrars have recorded the following information on the draft entry form:

- the date when the certifying doctor last saw the deceased alive
- whether the deceased was seen after death by a medical practitioner
- whether the death was reported to a coroner and by whom
- whether the certifying practitioner indicated that death might have been linked to the deceased’s employment

The first three items had been recorded on the medical certificate for many years for legal and administrative purposes. The fourth resulted from legislation passed in 1985.

1986

New stillbirth and neonatal death certificates were introduced in January 1986. The new neonatal certificate included both maternal and fetal conditions. This means that it is not possible to assign an underlying cause for deaths under 28 days. From 1986, therefore, tables of deaths by cause and age do not include neonates, although the all cause total for neonates is often given. Details of neonatal deaths by cause can be found in [Child mortality statistics](#).

1993

We reverted to the internationally accepted interpretation of Rule 3 operating in England and Wales before 1984 (see Section 16.2).

1993

Redevelopment of our collection and processing systems, which took effect on published mortality data from January 1993. Changes included:

- the computerisation of registration, with registrars in most local offices entering details on computers and supplying data to ONS on floppy disk
- the automation of cause of death coding, so that procedures for assigning codes to underlying cause are now automatic for about 80% of all deaths but not used for deaths certified after inquest
- the use of a dynamic database to hold all deaths data, for easy retrieval of up-to-date information; these and other changes are described in Section 12 and in more detail in [Death certification and the epidemiologist](#)

1993

A revised coroner's certificate of cause of death after inquest was introduced in May 1993, which resulted in less detail for many deaths from injury and poisoning (International Classification of Diseases, Ninth Revision (ICD-9) E800 to E999) – both for the description of injury sustained and for the classification of some suicides.

Following the introduction of the revised certificate, problems were identified relating to the processing of deaths certified after inquest due to the non-receipt of some data that contained additional detail about some accidental deaths. This resulted in more deaths being assigned to residual categories such as "other and unspecified causes" (ICD-9 E928.9). For this reason, the number of deaths coded to suicide and self-inflicted poisoning by motor vehicle gas exhaust (ICD-9 E952.0) declined substantially, while those from suicide and self-inflicted poisoning by other carbon monoxide (ICD-9 E952.1) rose.

To resolve this problem, we amended our systems and manually coded all deaths that resulted in a coroner's inquest or adjourned inquest. Data were re-coded where necessary for 1993 and 1994. Changes were concentrated in the external causes of the ICD, while the effect on other causes was limited.

1993

Ending of medical enquiries to obtain more precise information on the underlying cause of death.

1997

Provision for registration of a death by declaration was introduced in April 1997, whereby details of a death could be supplied to a registrar in a district other than that where the death took place. Analysis shows that this provision is most likely to be used for deaths of infants and for neonatal deaths in particular.

2001

Introduction of the Tenth Revision of the International Classification of Diseases (ICD-10) for coding cause of death on 1 January 2001. This replaced the Ninth Revision used from 1979 to 2000. There are some significant differences between the ICD versions. The main differences are:

- a change in format of the code and an expansion in the number of codes used
- a movement of some diseases and conditions between broad groups called ICD chapters
- changes to the rules governing the selection and coding of the underlying cause of death, especially Rule 3, which has had a large effect

We coded the 1999 registration dataset to both the Ninth and Tenth Revisions to give a guide to the effect of changes on specific categories of cause of death. [Results of the ICD-10 bridge coding study, England and Wales, 1999](#) were published in 2002. Research specifically examining the effect on injury and poisoning was published in [The effect of the introduction of ICD-10 on trends in mortality from injury and poisoning in England and Wales](#).

Further information about [Understanding the changes to mortality statistics following the move to coding cause of death to ICD-10](#) is also available.

2002

Introduction of the General Register Office Network (GRONET) to Register Offices began, allowing for births and deaths registration details to be sent directly to ONS via email.

2006

Introduction of Registration Online (RON) pilot areas enabling registrars to record births, stillbirths, deaths and civil partnerships online instead of using Registration Service Software (RSS).

2007

RON was implemented and due to significant performance problems suspended. This resulted in around half the registrars reverting back to using the previous electronic system, RSS.

2009

RON was fully implemented on 1 July 2009. Of all registrations in 2009, there were 83% recorded on RON.

2010

All deaths recorded using RON.

2011

In January 2011, the software used for cause of death coding was updated from the International Classification of Diseases, Tenth Revision (ICD-10) version 2001.2 to version 2010. The main changes in ICD-10 version 2010 are amendments to the modification tables and selection rules. Modification tables and selection rules are used to ascertain a causal sequence and consistently assign underlying cause of death from the conditions recorded on the death certificate. Overall, the impact of these changes is small although some cause groups are affected more than others. For further information, see the [results of the bridge coding study](#). There is also another study looking at the impact on [stillbirths and neonatal deaths](#).

2014

On 1 January 2014, the software used to code cause of death was changed. The new IRIS software version 2013 incorporates official updates to ICD-10 that are approved by WHO. Further information on IRIS can be found in Section 9.1. A [dual coding study](#) looked at the [impact on mortality statistics; a further study looked into the impact of the coding changes on stillbirths and neonatal deaths](#).

2014

On 1 October 2014, the [Presumption of Death Act 2013](#) came into force in England and Wales. This means that an application can be made 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.

2017

[Changes to the Policing and Crime Act 2017](#) removed the requirement for a coroner's inquest for every death where a Deprivation of Liberty Safeguard (DoLS) was in place. Deaths under DoLS, that occurred on or before 3 April 2017 should be treated outside the context of state detention and should only be reported to the coroner where one or more other conditions are met. This should result in a decrease in the number of inquests for natural deaths.

17 . Glossary

Accelerated registrations

The process by which a death can be registered at the time of adjournment of an inquest instead of having to await the outcome of criminal proceedings.

Age-standardised rates

A statistical measure to allow more precise comparisons between two or more populations by eliminating the effects in age structure by using a "standard population".

Annual extract

The dataset taken from the main deaths database from which tabulations are derived. Sometimes it is referred to as the “standard” extract.

Assault

The ICD-10 terminology referring to homicide and injuries inflicted by another person with intent to injure or kill, by any means (excluding deaths from legal intervention and operations of war).

Bridge coding

An exercise in which the same group of deaths are independently classified according to two different classifications or coding methods.

Comparability ratios

A measure, expressed as a ratio, indicating the net effect of the change in classification (from ICD-9 to ICD-10) on a particular cause of death.

Coroner

Public official responsible for the investigation of violent, sudden or suspicious deaths.

DCAG

Death Certification Advisory Group.

Declaration

The method by which an informant can register a death in a different district from that in which the death occurred.

Dual coding

The coding of the same data twice, using different methods of coding in order to assess inconsistencies.

Early neonatal

Relating to infants aged under seven days.

Epidemiologist

A person concerned with the incidence and distribution of diseases and other factors, including the environment, relating to health.

External cause

Death resulting from accident or violence. An alternative term for the underlying cause of death. ICD codes from Chapter XX; see Secondary causes.

GRO

General Register Office, located in Southport, England.

Hierarchical classification

ONS's method for classifying the causes of neonatal deaths and stillbirths using groups of ICD codes referred to as "ONS cause groups".

ICD

[International Classification of Diseases.](#)

Informant

The person who provides the registrar with the information required to register a death.

Inquest

Inquiry into the cause of an unexplained, sudden or violent death held by a coroner.

LEP

Life Events Processing Branch at ONS.

MCCD

Medical Certificate of Cause of Death.

Modification rules

Rules used in ICD-10 to select the correct underlying cause of death.

MMDS

Medical Mortality Data Software developed by the NCHS in the USA.

NCHS

National Center for Health Statistics, USA.

Neonatal

Relating to infants aged under 28 days.

NHSCR

National Health Service Central Register.

ONS

Office for National Statistics.

Perinatal

Includes stillbirths and early neonatal deaths.

QCC

Quarterly Certified Copy. Copies made of each Register, sent to the GRO at Southport.

Registrar

Statutory officer responsible for the registration of births, deaths and marriages.

Registrar General

Statutory appointment with responsibility for the administration of the Registration Acts in England and Wales, and other related functions as specified by the relevant legislation.

RON

Registration Online. A web-based system, which enables registrars to record births, stillbirths, deaths, marriages and civil partnerships online.

RSS

Registration Service Software. System of collecting data electronically at the registration of a birth or death. Used prior to RON.

Rule 3

One of the rules used to select the correct underlying cause of death; its different use in ICD-10 results in significant differences from ICD-9 for some causes; see Selection rules.

Secondary cause

The nature of injury, or main injury, that caused death (where the underlying cause is assigned to an external cause from Chapter XX in ICD-10, V01 to Y89). Nature of injury codes are taken mostly from Chapter XIX (prefixes S and T).

Selection rules

Rules used in the ICD to determine the correct selection of the underlying cause of death; see Rule 3.

Sequela (sequelae)

A condition (or conditions) reported as the result of a previous injury – a “late effect” (under ICD-9) or that occurs as a late effect one year or more after the originating event.

Standard population

Used in the calculation of the age-standardised death rates; an element of the population (such as age and sex) is “held constant” to control its effect, for example, the European Standard.

Stillbirth

Refer to the Stillbirth (Definition) Act 1992; a child born after 24 or more weeks completed gestation who did not show any signs of life at any time after being born.

Superintendent registrar

Statutory officer with responsibilities relating to births, deaths, marriage and other registration functions, as specified in the relevant legislation.

UK Statistics Authority

The UK Statistics Authority is an independent body operating at arms' length from government as a non-ministerial department, directly accountable to Parliament. It was established on 1 April 2008 by the Statistics and Registration Service Act 2007.

Underlying cause of death

“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.

VSOB

Vital Statistics Outputs Branch at ONS.

WHO

World Health Organization.