

# Child and infant mortality statistics QMI

Quality and Methodology Information for child and infant mortality statistics, detailing the strengths and limitations of the data, methods used and data uses and users.

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# 1 . Output information

<b>National Statistic</b>	
<b>Frequency</b>	Annual
<b>How compiled</b>	Administrative data
<b>Geographic coverage</b>	England and Wales
<b>Last revised</b>	20 February 2020

## 2 . About this Quality and Methodology report

This Quality and Methodology Information (QMI) report contains information on the quality characteristics of the data (including the European Statistical System's five dimensions of quality) as well as the methods used to create it.

The information in this report will help you to:

- understand the strengths and limitations of the data
- learn about existing uses and users of the data
- reduce the risk of misusing data
- decide suitable uses for the data
- understand the methods used in creating the data

## 3 . Important points

- The Births and Deaths Registration Act 1836 made it a legal requirement for all births and deaths to be registered from 1 July 1837; these data are the most complete data source available.
- The registration of births and deaths is a service carried out by the local registration service in partnership with the General Register Office (GRO) in England and Wales.
- We produce two publications about child and infant mortality: [Child mortality \(death cohort\) tables](#) and [Infant mortality \(birth cohort\) tables](#).
- [Child mortality \(death cohort\) tables](#) present statistics for stillbirths, infant and childhood deaths occurring in England and Wales in the reference year.
- For this publication, infant deaths are linked to their corresponding birth record to enable analysis of risk factors and demographic characteristics collected at birth registration.
- From 2019, infant deaths from the death cohort are additionally linked to their birth notification data to allow for more timely analysis by gestational age; this linkage has been applied to data years 2007 to 2019.
- The main difference with the [Infant mortality \(birth cohort\) tables](#) is that they present statistics based on babies born in a calendar reference year, that died before their first birthday.
- For this publication, the birth notification is linked to birth registration, which is then linked to their corresponding death record to enable greater analysis of risk factors and demographic characteristics.
- For deaths at or over 28 days of age, the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) has been used to classify the cause of death, allowing comparable cause of death statistics from 2001 to the latest year available.

## 4 . Quality summary

### Overview

[Child mortality \(death cohort\) tables](#) present figures and rates on stillbirths, infant deaths (under 1 year of age) and childhood deaths (between 1 and 15 years of age) occurring annually in England and Wales. It also contains historical data back to 1981. The statistics are derived from information recorded when births and deaths are registered in England and Wales as part of civil registration; a legal requirement.

Some tables are based on infant deaths that have been successfully linked to their corresponding birth registration. This linkage enables analysis of risk factors and other demographic characteristics collected at birth registration including:

- birth weight
- mother's age at birth of child
- mother's country of birth
- marital status
- number of previous children
- parents' socio-economic status

Further linkage of infant deaths in the death cohort data to their corresponding birth notification enables analysis of the following risk factors:

- gestational age
- ethnicity of the baby as defined by the mother

[Infant mortality \(birth cohort\) tables](#) present data on infant deaths for those babies that were born in a reference year and died before their first birthday. The tables also provide data by some of the risk factors affecting infant deaths derived from linking the death to the corresponding birth registration record and birth notification.

More information about the certification and registration of childhood and infant deaths can be found in the [User guide to child and infant mortality statistics](#). More general information on the collection, production and quality of mortality data is available in the [User guide to mortality statistics](#). Additional information on the collection and quality of data for births can be found in the [User guide to birth statistics](#).

## Uses and users

The Department of Health and Social Care (DHSC), Welsh Government (WG) and Public Health England (PHE) are key users of child and infant mortality statistics. Child and infant mortality figures feed into the [national Child and Maternal Health intelligence network](#). Reducing deaths in babies and young children is also included within the [NHS Outcomes Framework](#). The statistics help users understand trends in risk factors for infant mortality, such as:

- age of mother
- gestational age
- birth weight
- marital status
- number of previous children
- parents' socio-economic status

Understanding why children are dying is vital to inform policy changes intended to reduce the infant mortality rate.

Organisations such as [Eurostat](#) and the UN Statistics Division use our child mortality statistics, for example, to monitor progress towards global indicators as part of the [UN's Sustainable Development Goals](#).

Other users of this output include academics, independent researchers of infant mortality, charities and the media.

## Recent improvements

From 2019, all child mortality (death cohort) tables now include all infant deaths rather than just those deaths that linked to their corresponding birth registration or birth notification. This ensures consistency in the presentation of the total number of infant deaths across the dataset. There have also been several updates made to the death cohort tables to improve clarity for users and increase consistency across tables and across other Office for National Statistics (ONS) publications; no existing data have been removed, unless they can be found in other ONS publications.

## 5 . Quality characteristics of the child mortality and infant mortality statistics

### Output quality

This document contains a range of information that describes the quality of the data and details any points that should be noted when using the output. The Office for National Statistics (ONS) has developed [Guidelines for measuring statistical quality](#); these are based upon the five European Statistical System (ESS) Quality Dimensions.

This report addresses these quality dimensions and other important quality characteristics, which are:

- relevance
- timeliness and punctuality
- coherence and comparability
- accuracy
- output quality trade-offs
- concepts and definitions
- geography
- accessibility and clarity

### Relevance

(The degree to which the statistical output meets users' needs.)

These statistics are based on details collected when deaths are certified and registered. The live births and stillbirths information is based on the details collected when births are registered or notified.

The statistics present the number of births and deaths that occurred in the reference year and the corresponding rates. Figures are published for live births, stillbirths, infant mortality and child mortality.

Births and deaths of all residents of England and Wales that occur and are registered outside of England and Wales are excluded. Births and deaths registered in England and Wales of persons whose usual residence is outside England and Wales are included for any total figures for England and Wales but are excluded from any sub-division of England and Wales.

The published tables of data are accompanied by a statistical bulletin, which provides analysis and context. The [User guide to child and infant mortality statistics](#) and the [User guide to mortality statistics](#) provide further information on the collection, production and quality of mortality data.

## Figure 1: Categories of age at death

### Infant deaths

We publish stillbirths and infant deaths by the characteristics listed in Table 1 in each publication.

Table 1: Characteristics of stillbirth and infant deaths data  
England and Wales, 2019

Variable	Child mortality (death cohort) tables	Infant mortality (birth cohort) tables	Explanation
Age of mother	Yes	Yes	At the time the child was born, providing a useful comparison between younger and older age groups of mothers.
Birthweight	Yes	Yes	Presented as a grouped variable to distinguish death rates for low and normal birth weight babies.
National Statistics Socio-economic Classification (NS-SEC)	Yes	Yes	As defined by occupation. For further information on socio-economic classification as defined by occupation, refer to Section 7.1 of the User guide to child and infant mortality statistics. Additional information is given in the Coherence and comparability section in this QMI report.
ONS cause of death group	Yes	Yes	A hierarchical classification of cause groups using the International Statistical Classification of Diseases Tenth 10th Revision (ICD-10) has been developed to derive a single cause group for neonatal deaths and stillbirths. The classification enables direct comparison of stillbirths, neonatal and postneonatal deaths.  For further information on the ONS cause of death groups hierarchical classification, refer to Section 6.2 of the User guide to child and infant mortality statistics.
Previous children	Yes	Yes	Number of previous children born to the mother.
Place of delivery	Yes	Yes	The classifications for this are different in Child mortality (death cohort) tables and Infant mortality (birth cohort) tables. For more information on classifications, please see the Coherence and comparability section in this QMI report.
Gestational age	Yes	Yes	Measured in completed weeks.
Ethnicity	No	Yes	Baby's ethnicity as defined by the mother.

For all deaths at age 28 days or over, a single underlying cause of death can be reported using the standard death certificate. However, for deaths at under 28 days, a special death certificate is used, which enables reporting of relevant diseases or conditions in both the infant and the mother. This means that an underlying cause of death cannot be assigned to neonatal deaths. The ONS has developed a [hierarchical classification system \(PDF 72KB\)](#) producing broad cause groups to enable direct comparison of neonatal (under 28 days) and postneonatal deaths (at 28 days or over) despite the differences in certification.

## Timeliness and punctuality

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

[Child mortality \(death cohort\) tables](#) are based on information recorded when deaths are certified and registered. The annual total number of deaths occurring in a calendar year is taken from the standard dataset for death occurrences created from the deaths database. This annual extract is taken approximately 9 to 10 months after the end of the data year to allow for late registrations. There will still be a small number of deaths not registered when the annual extract of death occurrences is taken, but it will be a relatively small number, and we have determined that taking the extract at this point is a good balance between accuracy and timeliness.

[Infant mortality \(birth cohort\) tables](#) are based on births occurring in a reference year, linked to their birth notification and subsequent death registration where the infant has died within one year of birth. The annual births extract is taken approximately 6 to 7 months after the end of the data year. This is then linked to infant deaths in both the reference year and the following year. This is because an infant born at the start of the reference year may die during that year or an infant born at the end of the reference year may die towards the end of the following year, but still before their first birthday.

The extracts for these infant deaths are taken approximately 10 to 11 months and 22 to 23 months after the end of the data year respectively. Infant mortality (birth cohort) tables are therefore less timely than the child mortality (death cohort) tables.

The annual release of both publications is announced on the [GOV.UK release calendar](#) at least four weeks in advance.

For more details on related releases, the [GOV.UK release calendar](#) is available online and provides 12 months' advance notice of release dates. In the unlikely event of a change to the pre-announced release schedule, public attention will be drawn to the change and the reasons for the change will be explained fully at the same time, as set out in the [Code of Practice for Statistics](#).

## Coherence and comparability

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

### General

Following the results of the infant mortality user consultation, carried out in spring and summer 2017, we combined [Birth cohort tables for infant deaths](#) and [Pregnancy and ethnic factors influencing births and infant mortality](#) into one publication called [Infant mortality \(birth cohort\) tables](#). There have been revisions to both sets of tables to improve presentation and to meet our users' needs, details of which are available in the [response](#) to the consultation.

Other changes were made after an earlier consultation in 2012, primarily that we discontinued the [Infant and perinatal mortality in England and Wales by social and biological factors](#) publication.

The linkage of birth and infant death records has been conducted since 1975 to obtain information on the social and biological factors of the baby and parents, as registered on the birth registration. Over the years, there have been significant changes in the way some of the risk factor variables have been coded. Therefore, comparability over time is limited for some variables.

On 1 October 1992, the [Still-Birth \(Definition\) Act 1992](#) came into force, altering the previous definition of a stillbirth from 28 or more weeks completed gestation to 24 or more weeks completed gestation. This means that figures for stillbirths from 1993 are not comparable with those for previous years. The effect of this change on figures for 1992 is analysed in the annual volume of birth statistics for that year (Office of Population, Censuses and Surveys (OPCS) 1994).

In 1986, the World Health Organization (WHO) recommended a change of format of the certificate to include maternal conditions. Subsequently, the ONS introduced new certificates for registering neonatal deaths and stillbirths in England and Wales, which allowed certifiers greater flexibility in the number and ordering of the causes given.

However, this made it impossible to either derive a single underlying cause of death (for neonatal deaths and stillbirths) or to compare with cause of death for postneonatal deaths, which are certified on the standard death certificate. For this reason, a hierarchical classification, known as the ONS cause groups, was developed for stillbirths and neonatal deaths to identify a single underlying “mechanism” that led to death. A computer algorithm directs any mention, in the case of neonatal deaths, and underlying cause, in the case of postneonatal deaths, to the first appropriate cause group.

For the data years 2001 to 2013, postneonatal deaths were assigned to the ONS cause groups based on mentions rather than underlying cause. We undertook some analysis of the impact of this change, and the results showed that it was negligible. Stillbirths and infant mortality data by ONS cause groups are not available prior to 1993.

The [Human Fertilisation and Embryology Act 2008](#) contained provisions enabling two females in a same-sex couple to register a birth from 1 September 2009. Because of the small numbers, births registered to a same-sex couple in a civil partnership are included with marital births, while births registered to a same-sex couple outside a civil partnership are included with births outside marriage. Tables are footnoted to show the number of births to same-sex couples included with marital and non-marital births. Given the relatively small numbers of births registered to same sex-couples, the impact on the statistics is negligible.

## Cause of death

Information on cause of death in England and Wales has been coded to the International Statistical Classification of Diseases 10th revision (ICD-10) since January 2001. The ICD-10 was implemented on the recommendation of the WHO and replaced the ICD-9, which had been in use since 1979. [Further information on changes in the ICD-10 and comparability between the ICD-9 and ICD-10](#) is available.

In January 2011, the ONS switched from using the ICD-10 v2001.2 to use v2010. A bulletin presenting the main findings from the [bridge coding study of 2009 stillbirth and neonatal death registrations](#) (in which deaths were independently coded using v2001.2 and v2010) is available to help users understand the impact of this change on perinatal mortality statistics for England and Wales. The [impact of the ICD-10 v2010 on other deaths](#) has been investigated in a separate study.

On 1 January 2014, the ONS changed the software used to code cause of death from the Medical Mortality Data Software (MMDS) to IRIS. The new IRIS software version 2013 incorporates official updates to the ICD-10 that are approved by the WHO. The use of the IRIS software has helped improve the international comparability of mortality statistics.

For stillbirths and neonatal deaths, any maternal condition mentioned on the death certificate are coded to chapter XVI (certain conditions originating in the perinatal period) rather than elsewhere in the ICD classification. Previously, these deaths may have been coded to chapter XV (pregnancy, childbirth and the puerperium).



On 1 January 2020, we again updated the IRIS software to the Multicausal and Unicausal Selection Engine (MUSE) (IRIS version 5.5). The MUSE operates based on internationally agreed decision tables that reflect the most recent version of ICD-10. This system also increases the automation of coding compared with the previous software.

Further information on the impacts of changes to cause of death coding software is available:

- [Impact of the Implementation of IRIS Software for ICD-10 Cause of Death Coding on Mortality Statistics](#)
- [Impact of the implementation of IRIS software for ICD-10 cause of death coding on stillbirth and neonatal death statistics](#)
- [Cause of death coding in mortality statistics, software changes: January 2020](#)

Additional details on specific historical changes to the collection and coding of mortality data are published in [Section 16 of the User guide to mortality statistics](#).

## Country of birth

A new coding system for country of birth was introduced in 2006 and was used to code mother's and father's country of birth. The [National Statistics country classification](#) is based on the International Organization for Standardization (ISO) 3166 codes for the representation of names of countries and their subdivisions, adapted to meet the data needs of UK [National Statistics](#)' users and producers.

## Socio-economic classification

Over the years the framework and definitions used to describe socio-economic class based on occupation have undergone numerous changes. Since 2001, the [National Statistics Socio-economic Classification \(NS-SEC\)](#) has been used for all [official statistics](#) and surveys. It replaced Social Class (SC) based on Occupation (formerly Registrar General's Social Class) and Socio-economic Groups (SEGs). This change was agreed by the National Statistician following a major review of government social classifications commissioned in 1994 and carried out by the Economic and Social Research Council. In 2011, the NS-SEC was rebased on the new Standard Occupational Classification (SOC 2010). The new classification is based not on skills but on employment conditions, which are now considered to be central to describing the socio-economic structure of modern societies.

Up until the 2011 data year, child and infant mortality and birth statistics were published based on father's NS-SEC. Historically, the decision to use father's NS-SEC was based on the premise that many mothers either did not have a paid occupation or choose not to state their occupational details at birth registration. From the 2012 data year, the combined method for reporting the NS-SEC for birth and child mortality statistics (using the most advantaged NS-SEC of either parent and creating a household-level classification rather than just using the father's classification) has been used instead. These changes mean that figures from the 2012 data year onwards are not directly comparable with previous years.

## Previous children

Amendments to the [Population \(Statistics\) Act 1938](#) mean that, from May 2012, information is now collected at all birth registrations on the total numbers of previous live births and previous stillbirths that the mother has had (not just those with the current or former husband). This has simplified the question asked by registrars and provides improved coverage. A paper describing the [changes that have occurred to our birth statistics as a result of improvements to the Population \(Statistics\) Act](#) is available. It provides background to the changes and provides high-level findings from the new data collected in 2012 and 2013.

The difference between the old and new data in the proportion of married women reporting previous births is larger than was expected purely from the question change. More information can be found in the methodology paper on [Quality assurance of new data on birth registrations, as a result of changes to the Population \(Statistics\) Act – from May 2012 onwards](#).

[An investigation of childbearing by registration status in England and Wales, using birth registration data for 2012 and 2013](#) examines the patterns and characteristics in birth registrations following the improvements to the data collected at birth registration. The principal characteristics explored in the paper relate to whether a woman has been previously married and whether the birth is the mother's first child or subsequent child.

Only minor changes have been made to published tables for 2012 and 2013 since the first full year of new data in 2013, but some childhood deaths in this year will relate to births in 2012 prior to the changes being implemented. The main improvements resulting from the amendments to the [Population \(Statistics\) Act 1938](#) have been introduced to published tables for child deaths occurring in 2014. Figures for 2014 onwards are not comparable with previous years.

## Place of delivery

The classification for place of delivery is different between the two publications because the datasets used are different. The classification used in the [child mortality \(death cohort\) tables](#) include hospital and other healthcare establishments, at home and elsewhere. The classification used in the [infant mortality \(birth cohort\) tables](#) is only available from the birth notification data. It includes:

- NHS hospital – delivery facilities associated with midwife ward
- NHS hospital – delivery facilities associated with consultant ward
- NHS hospital – delivery facilities associated with consultant, GMP or midwife ward inclusive of any combination
- NHS hospital – ward with no delivery facilities
- private hospital
- other hospital or institution
- domestic address
- unknown

## UK comparability

For mortality data for other UK countries, please see [stillbirths and infant deaths in Scotland](#) and [stillbirths and infant deaths in Northern Ireland](#). Considerations need to be made when drawing comparisons between infant mortality statistics for England and Wales and statistics for Scotland and Northern Ireland. Infant mortality statistics for England and Wales are based on date of death while infant mortality statistics for Scotland and Northern Ireland are based on date of registration. For more information see section 5 of the [User guide to child and infant mortality statistics](#).

## Accuracy

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

Information recorded at birth and death registration in England and Wales passes through a number of processes before it is analysed. The [User guide to mortality statistics](#) provides additional information on the collection, processing and quality of mortality data for England and Wales. More specific information relating to stillbirths and infant deaths is available in the [User guide to child and infant mortality statistics](#). The [User guide to birth statistics](#) provides detailed information on the registration, collection and quality of births data in England and Wales.

The accuracy of information contained in the draft birth entry is the responsibility of the informant(s), usually the mother, or the mother and father where the registration is a joint one outside marriage. Wilfully supplying false information may render the informant(s) liable to prosecution for perjury. It is believed that, in general, the information supplied by the informant(s) is correct.

Occasionally, birth information might be missing from an entry. This can occur for a number of reasons including the informant refusing to give information or the informant not knowing the information. Under the Population (Statistics) Acts, certain confidential data items are collected at the registration of a birth. If any of these data items were missing, an appropriate value was imputed. However, this was discontinued in March 2018 to make processing more efficient and our methods easier for users to understand, and it was without any negative effect on accuracy because of the small numbers involved. More information on the imputation of missing births data can be found in [Section 4 of the User guide to birth statistics](#); the number of birth records missing age of parents' can be found in subsection 4.8. For years prior to 2012, the number of records missing information on previous live-born children can be found in subsection 4.12.

For deaths, other than the cause of death (including a stillbirth), additional information is supplied to the registrar by the informant when the death is registered. For deaths certified after inquest, the coroner, police officers or other witnesses may supply this information, which cannot later be checked by the registrar.

When a birth or death is registered, the registration system provides the opportunity for the registrar to make validation checks at the point of registration, thereby improving the quality of the data. Internal consistency checks are conducted by the ONS to eliminate any errors made in the supply and recording of birth and death records. Checks are more frequent on those records with extreme values for the main variables (such as age of mother and father), as these have a greater impact on published statistics. A small number of registrations are raised with the General Register Office (GRO) on a monthly basis for verification.

Until the 2019 data year, some tables in [Child mortality \(death cohort\) tables](#) show the latest figures for infant deaths that occurred in a given year, while others are based on infant deaths that occurred in a given year and that have been successfully linked to their corresponding birth record. From 2019 onwards, all tables in [Child mortality \(death cohort\) tables](#) show the latest figures for infant deaths that occurred in a given year.

For death cohort tables that analyse birth registration variables such as age of mother, any infant deaths that did not successfully link to their birth registration are either included in a "Not Stated" category, or where rates are being produced on linked infant deaths; unlinked deaths are presented separately.

The [Infant mortality \(birth cohort\) tables](#) are births occurring in a reference year that have been successfully linked to their corresponding birth notification and death registration record for those babies who died before their first birthday.

Around 3% of infant deaths cannot be linked to a birth record. The main reasons for this are either that a birth record cannot be found or the birth was registered outside England and Wales. Further information on the linkage process is available in [Section 7 of the User guide to child and infant mortality statistics](#).

Any late registrations received following the extraction of the death occurrence subset for a reference year are not included in published figures. See the Timeliness and punctuality subsection for further information.

## Output quality trade-offs

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

[Child mortality \(death cohort\) tables](#) and the [Infant mortality \(birth cohort\) tables](#) are based on the date the death occurred rather than the date on which it was registered. Although this means that there is a delay in the publication of these statistics to allow for late death registrations, there are a number of advantages of using death occurrences over registrations. It is also what users have told us they want. See [Section 3 of the User guide to mortality statistics](#) for further information.

## Concepts and definitions

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

All the relevant definitions are available in [Section 9 of User guide to child and infant mortality statistics](#).

Since 1 September 1992, a stillbirth has been defined as a baby born after 24 or more weeks' completed gestation and who did not, at any time, breathe or show signs of life. Prior to this, a stillbirth was as stated previously, but at 28 or more weeks completed gestation. See Coherence and comparability section for further information.

For information on the categories of infant deaths based on age (for example, neonatal and postneonatal), see the Relevance subsection.

Amendments to the [Population \(Statistics\) Act 1938](#) mean that from May 2012, information is now collected at all birth registrations on the total numbers of previous live births and previous stillbirths that the mother has had (previously, information was only collected for married women and only included previous children with the current or former husband). This has simplified the question asked by registrars and provides improved coverage.

Plurality refers to the total number of live births and stillbirths at the maternity.

The rates used in the tables are outlined in [Section 3 of the User guide to child and infant mortality statistics](#).

The existing provisions for the registration of deaths and the processing, reporting and analysis of mortality can be found in the [User guide to mortality statistics](#).

## Geography

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. For more information, please see [Section 5 of the User guide to mortality statistics](#).

## Accessibility and clarity

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

The latest figures on [Child mortality \(death cohort\) tables](#) and the [Infant mortality \(birth cohort\) tables](#) can be accessed free of charge on our website. A statistical bulletin containing context and commentary accompanies the release. The bulletin describes the main trends, looking at age-specific mortality rates, and reports on the latest statistics on stillbirths and infant deaths.

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

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

- [terms and conditions \(for data on the website\)](#)
- [accessibility](#)

Special extracts and tabulations of child mortality and infant 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 Vital Statistics Outputs Branch by email at [Health.Data@ons.gov.uk](mailto:Health.Data@ons.gov.uk) or telephone at +44 1329 444 110. All [user-requested data](#) will be published on the website.

Access to microdata and disclosive data, that is data that have the potential to identify an individual record, requires the approval of the ONS Microdata Release Panel (MRP) before the data can be provided.

## 6 . Methods used to produce the child mortality (death cohort) and infant mortality (birth cohort) statistics

Deaths in England and Wales 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 well as details of the death (for example, cause of death, when the deceased was last seen alive and whether a post-mortem was carried out), information is also collected about the deceased (for example sex, usual residence, place of birth and date of birth).

All births in England and Wales must be registered within 42 days of occurrence. As well as details of the birth (including date, sex, and single or multiple birth), information is also collected about the parents for the public register and for statistical purposes (for example, mother's usual residence and her age at the time of the birth). Information is collected about the second parent if the parents are married or in a civil partnership or if the second parent is present at the registration (known as joint registration).

The birth notification is a document completed by the doctor or midwife present at the birth. It includes information that is not on the birth registration like gestation length and ethnicity of the baby. The [National Health Service Act 2006](#) (amended in 2013) and [National Health Service \(Wales\) Act 2006](#), require notification of a birth to the local authority and clinical commissioning group (local health board in Wales) where the birth occurred. A list of the birth notifications for the sub-district is supplied to the registrar, who will then check whether every birth has been registered. The registrar will also verify each birth registered by checking it is on the health authority list.

### How we collect and process child mortality (death cohort) statistics

Statistics in [Child mortality \(death cohort\) tables](#) are based on information collected at the registration of infant death. Where possible, this information has been linked to their corresponding birth registration to obtain information on social and biological factors of the baby and parents that is not available on the death record.

From the 2019 data year, death cohort data have been additionally linked to the corresponding birth notification to enable more timely analysis on infant mortality by factors such as gestational age, which are not available from either the birth or death registration. This linkage has been applied to data years 2007 (the earliest year for which linkage of deaths to the birth notification is possible) to 2019.

## How we collect and process infant mortality (birth cohort) statistics

Statistics in [Infant mortality \(birth cohort\) tables](#) are based on information collected at the registration of a birth and the death record where that infant has subsequently died. Where possible, this combined information is then also linked to their corresponding birth notification to obtain information on social and biological factors of the baby and parents that is not available from either type of registration – specifically, ethnicity and gestational period.

In order to capture more of the late infant death registrations, the timings of the extracts taken to produce the infant death figures in the infant mortality (birth cohort) tables have been changed. This change resulted in approximately 5% to 6% more infant deaths included in infant mortality (birth cohort) tables in 2015. As a result, the infant mortality (birth cohort) figures are not directly comparable with years prior to 2015.

The figures in the [child mortality \(death cohort\) tables](#) are unaffected. These are comparable with previous death cohort child mortality figures. The total number of live births and stillbirths published in [birth characteristics tables 7 to 11](#) will not change.

The NHS birth notifications system collects information about ethnicity to help organisations monitor their service delivery. Ethnicity is usually self-defined, and for birth notifications the baby's ethnic group is defined by the mother.

For babies born in 2018, 4.1% of live births had ethnicity recorded as “not stated”. This can include “not known”, “missing” and “not asked”.

Low gestational age is a main risk factor associated with mortality in the perinatal period. Linking birth notifications data to information collected at registration allows gestational age to be analysed with other information routinely collected at birth registration.

The Regional Director of Public Health must be notified of a birth within 36 hours by a doctor or midwife. At this point, the Personal Demographics Service allocates an NHS number (previously, this was done by the NHS Number for Babies service, which was decommissioned in early 2015), and the doctor or midwife records the birth details that are not collected at birth registration.

We receive birth notifications data from the NHS for linkage with birth registration records for statistical purposes. The registrar links the birth notification to the registration details at the time of registration. This linkage creates a unique sequence number, which we then use to re-link the records for this birth cohort. A small number of records require us to use probabilistic linkage where this unique identifier is not available; these records are matched on a number of selected variables.

We hold the registration data on all deaths occurring in England and Wales. Routine linkage of birth records to death registration records identifies those babies who died before their first birthday.

For babies born in 2018, 656,723 live birth registration records were successfully linked to their birth notification records. This represents 99.9% of the registration records of live births. Of these linked records, 0.1% (580) were probabilistically linked.

## How we collect, process and analyse the data

For information on administrative sources of data that the ONS uses to produce statistics (including a list of administrative sources), or that are available for use in the production of statistics in the future, and information on statistical techniques for using administrative data, please see the [Statement of Administrative Sources](#).

More detailed information on the main processes used in the compilation of mortality and birth statistics, and on the accuracy and quality of the data used, are available in the [User guide to mortality statistics](#) and the [User guide to birth statistics](#).

The denominators used to calculate rates for stillbirths and infant deaths are births that occurred in the same year (that is the true population at risk). For childhood mortality (deaths between one and 15 years of age), the denominators are the [mid-year population estimates](#) of the resident population in England and Wales for the reference year; the most up-to-date estimates at the time of production are used.

Rates are not calculated where there are fewer than three deaths in a cell, denoted by (u). It is the 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.

Some data items collected under the Population (Statistics) Acts 1938, 1960 and 2012 have been aggregated to protect confidentiality. Occasionally, it has been necessary to apply secondary suppression to avoid the possibility of disclosure by differencing. Some of the figures in some tables may not add precisely owing to rounding or suppression.

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

## 7 . Other information

### Assessment of users' needs and perceptions

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

The Office for National Statistics (ONS) response to the [review of infant mortality statistics](#) that took place between 20 April 2017 and 20 July 2017 is available.

A [proposal for changes to birth statistics by socio-economic classification](#) was published in February 2013. No feedback was received, so the outlined changes were implemented.

Proposed changes to child mortality statistics were outlined in the [Child and infant mortality in England and Wales: 2011](#) statistical bulletin (published February 2013), and user feedback was requested. Very little feedback was received, so the proposed changes have been implemented.

User feedback is requested at the bottom of all emails sent by customer service teams within the Vital Statistics Outputs Branch.

We also receive feedback through regular attendance at user group meetings and conferences.

## Useful links

- [Child mortality \(death cohort\) tables](#) – statistics on stillbirths, infant deaths and childhood deaths occurring in a given year in England and Wales.
- [Infant mortality \(birth cohort\) tables](#) – statistics on stillbirths, live births and deaths of infants born in a calendar year using additional data from the birth registration and birth notification.
- [Birth cohort tables for infant deaths](#) – deaths of infants born in a given calendar year using additional data from the birth record (this publication has been discontinued).
- [Pregnancy and ethnic factors influencing births and infant mortality \(previously called Gestation-specific mortality\)](#) – live births and infant deaths by gestational age (this publication has been discontinued).
- [Unexplained deaths in infancy](#) – both sudden infant deaths and deaths for which the cause remained unknown or unascertained.
- [Causes of neonatal deaths and stillbirths: a new hierarchical classification in ICD-10](#)

[Vital statistics in the UK: births, deaths and marriages](#) provides annual infant mortality data for the UK and its constituent countries (based on deaths registered in a year). For data for other UK countries, please see [the latest infant death statistics for Northern Ireland](#) and [the latest infant death statistics for Scotland](#).

Summary data for infant mortality in England and Wales (based on deaths registered in the year), are available in the [deaths registrations summary tables](#). A geographical breakdown of infant death numbers and rates by local authority and county (based on deaths registered in a year) is available in [Deaths registered by area of usual residence, UK](#).

The [births summary tables](#) for England and Wales provide summary statistics for live births.

More general information on the collection, production and quality of mortality data is available in the [User guide to mortality statistics](#).