

Statistical bulletin

# Unexplained deaths in infancy, England and Wales: 2018

Annual data on sudden infant deaths in England and Wales and infant deaths for which the cause remained unascertained after a full investigation, with associated risk factors.



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# 1 . Main points

- There were 198 unexplained infant deaths accounting for 8.0% of all infant deaths in England and Wales in 2018.
- The unexplained infant mortality rate had been decreasing since records began in 2004 but has levelled out since 2014 and was 0.30 deaths per 1,000 live births in 2018.
- Over half (57.6%) of all unexplained infant deaths were males in 2018 (114 deaths), which is a similar proportion when considering all infant deaths; unlike other infant deaths, unexplained infant deaths are more likely to occur in the postneonatal period.
- In 2018, the unexplained infant mortality rate was highest for mothers aged under 20 years, at 1.11 deaths per 1,000 live births.
- For almost every year since 2004, the unexplained infant mortality rate for babies of mothers born in the UK has been more than double the rate for babies of mothers born outside of the UK; some of this difference could be explained by the different age profiles of mothers born inside and outside the UK.
- The rate of unexplained infant deaths was over four times higher among low birthweight babies (less than 2,500g) than babies with a normal birthweight (2,500g and over) in 2018.

## Statistician's comment

“The rate of unexplained infant deaths had been decreasing since records began in 2004, but today's figures help confirm that these improvements have levelled off since 2014.

“There are a range of factors that influence the risk of an unexplained infant death, from sleeping practices to the age of the mother. Overall, the risk is relatively small, but we will continue to monitor the figures closely for further changes.”

Gemma Quayle, Vital Statistics Output Branch, Office for National Statistics

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# 2 . Trends in unexplained infant deaths in England and Wales

There were 198 unexplained infant deaths that occurred in England and Wales in 2018, which was slightly higher than the previous year (189 deaths). The number has generally been declining since records began in 2004, when there were 317 unexplained infant deaths.

Unexplained infant deaths include sudden infant deaths and unascertained deaths. In 2018, over half of unexplained infant deaths were recorded as sudden infant deaths (56.6%). The remaining deaths were assigned with the underlying cause of unascertained, where there was no clear evidence of sudden infant death syndrome (or any other cause of death).

Since records began in 2004, unexplained infant deaths accounted for approximately 7% to 10% of all infant deaths each year.

The unexplained infant mortality rate is a better measure for monitoring change over time than the actual number of deaths. It takes into account the number of live births each year, and this varies.

Since 2004, the unexplained infant mortality rate has gradually decreased (Figure 1). This overall decline is statistically significant.

In more recent years, the unexplained infant mortality rate has levelled out. Since 2014, there were approximately 0.30 unexplained infant deaths per 1,000 live births each year (Figure 1).

In 2018, the sudden infant death rate and unascertained infant death rate were 0.17 and 0.13 deaths per 1,000 live births respectively.

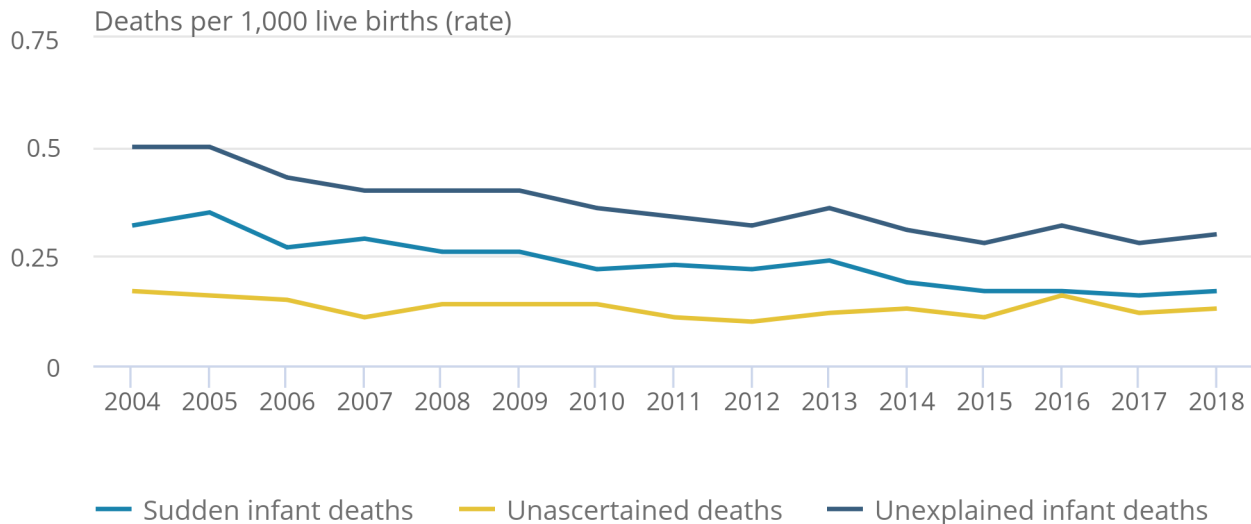
Because of the small numbers of unexplained infant deaths recorded each year, the data tend to fluctuate over time and therefore year on year changes in rates should be interpreted with caution.

## Figure 1: The unexplained infant mortality rate has flattened in recent years

Unexplained infant mortality rate, England and Wales, 2004 to 2018

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Unexplained infant mortality rate, England and Wales, 2004 to 2018



Source: Office for National Statistics - Deaths in England and Wales

#### Notes:

1. Figures are based on death occurrences.
2. Data for 2018 are provisional.
3. Sudden infant deaths are coded to ICD-10 code R95 and unascertained deaths are coded to ICD-10 code R99.
4. Unexplained infant deaths include both sudden infant deaths and unascertained deaths.

Unexplained infant mortality rates varied by regions in England and Wales, however these are based on a relatively small number of deaths. Table 4 of the [Unexplained deaths in infancy data tables](#) provide data by region.

[Known risk factors](#) for unexplained deaths in infancy include [maternal smoking during pregnancy](#), [postnatal exposure to tobacco smoke](#), sleeping position, not breastfeeding, overheating and sleep environments, including unplanned bed-sharing, the baby's head being covered and sleeping with a baby on a sofa. Some of these situations may be more likely to occur during the winter because of the use of extra clothing or blankets, and central heating at night.

The decrease in unexplained infant death rates since 2004 could therefore be driven by:

- advice and guidance that is available for parents from the [NHS](#), [Welsh Government \(PDF, 296KB\)](#), and charities such as [The Lullaby Trust](#), who raise awareness of [safer sleep practices](#) for parents
- a decrease in maternal smoking, as documented in [official NHS statistics](#)

### **3 . Unexplained infant deaths by sex and age**

Overall, males are at greater risk of an unexplained infant death than females. This is the same for all infant deaths. For unexplained infant deaths in 2018, there were 0.34 deaths per 1,000 live births for males, compared with 0.26 deaths per 1,000 live births for females.

The unexplained infant mortality rate for both males and females has fallen since 2004, but the rate for females fluctuated more between 2012 and 2018.

The majority (73.5%) of infant deaths from any cause occur in the neonatal period (within 28 days of birth), whereas unexplained infant deaths are more likely to happen later in infancy (Figure 2).

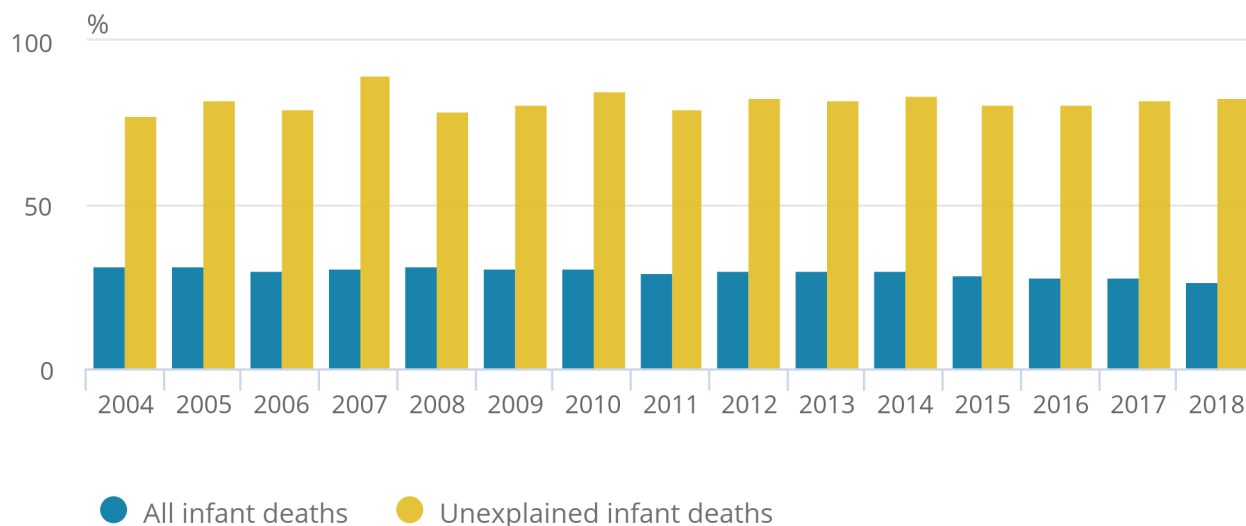
In 2018, over 80% of all unexplained infant deaths occurred in the postneonatal period (at least 28 days but less than one year after birth). This proportion has remained quite consistent over time.

## Figure 2: Compared to all infant deaths most unexplained infant deaths occur in the postneonatal period

Percentage of unexplained infant deaths and all infant deaths that occurred in the postneonatal period, England and Wales, 2004 to 2018

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Percentage of unexplained infant deaths and all infant deaths that occurred in the postneonatal period, England and Wales, 2004 to 2018



Source: Office for National Statistics - Deaths in England and Wales

#### Notes:

1. Figures are based on death occurrences.
2. Data for 2018 are provisional.

## 4 . Unexplained infant deaths by age of mother

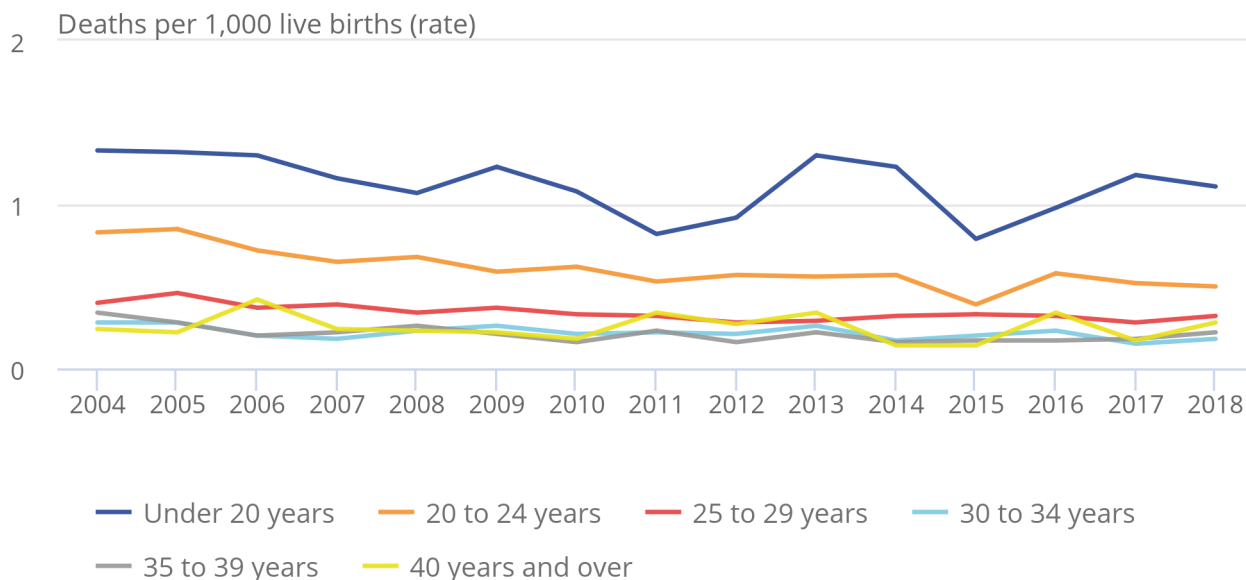
Maternal age is a risk factor for infant mortality generally and this holds true for unexplained deaths. In 2018, the unexplained infant mortality rate was highest for mothers aged under 20 years, at 1.11 deaths per 1,000 live births and this is consistent throughout the time series (Figure 3).

### Figure 3: The unexplained infant mortality rate is highest for mothers aged under 20 years

Unexplained infant mortality rate by mother's age, England and Wales, 2004 to 2018

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Unexplained infant mortality rate by mother's age, England and Wales, 2004 to 2018



Source: Office for National Statistics - Deaths in England and Wales

#### Notes:

1. Figures are based on death occurrences.
2. Data for 2018 are provisional.

## 5. Unexplained infant deaths by mother's country of birth

In 2018, the unexplained infant mortality rate for babies of mothers born in the UK was more than twice the rate for babies of mothers born in other countries. The rates were 0.35 deaths per 1,000 live births and 0.17 deaths per 1,000 live births respectively. This pattern has been observed for all years since 2004, and for most years the rate has been more than double the rate for babies of mothers born outside the UK (Figure 4).

Although we do not have the data available to explain all of this difference, it may be partly because of differences in maternal age between the two groups.

For all infant deaths, the infant death rate in Table 11 of the [Child and Infant mortality tables](#) was higher for mothers born outside the UK compared with mothers born in the UK in 2018 (3.9 compared with 3.6 deaths per 1,000 live births). This different pattern may partially be explained by the different age profile of unexplained infant deaths compared with all infant deaths.

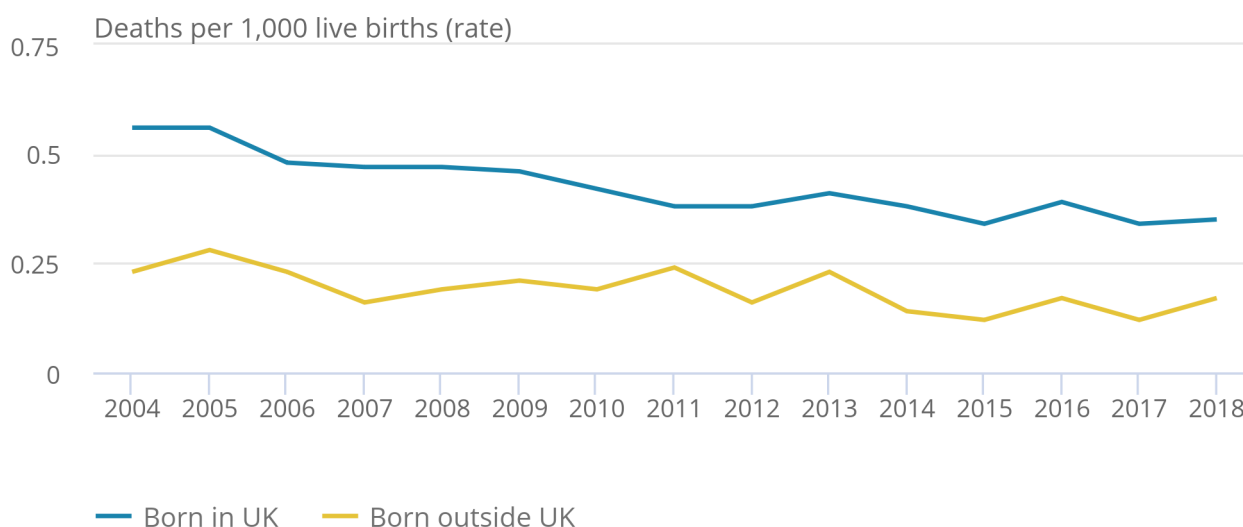
Unexplained infant deaths are most likely to occur during the postneonatal period, whereas infant deaths from other causes tend to occur during the neonatal period. For neonatal deaths, the mortality rate is higher for mothers born outside the UK compared with mothers born in the UK, but for postneonatal deaths, the rates are similar each year.

**Figure 4: The unexplained infant mortality rate is higher for babies of mothers born in the UK**

Unexplained infant mortality rate by mother's country of birth, England and Wales, 2004 to 2018

### Figure 4: The unexplained infant mortality rate is higher for babies of mothers born in the UK

Unexplained infant mortality rate by mother's country of birth, England and Wales, 2004 to 2018



Source: Office for National Statistics - Deaths in England and Wales

Notes:

1. Figures are based on death occurrences.
2. Data for 2018 are provisional.

## 6 . Unexplained infant deaths by birthweight

Low birthweight is associated with higher infant mortality, premature birth, and other factors affecting fetal growth during pregnancy, such as maternal smoking. In 2018, the unexplained infant mortality rate for low birthweight babies (under 2,500 grams) was 1.07 deaths per 1,000 live births. This was over four times higher than babies with normal birthweight (2,500 grams and over) at 0.23 deaths per 1,000 live births (Figure 5).

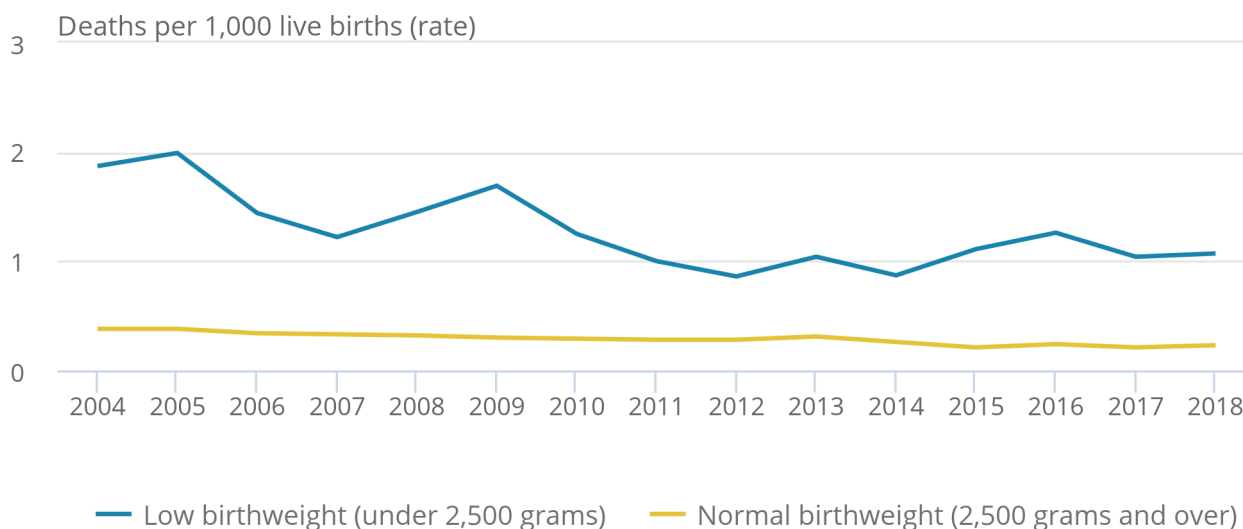


## Figure 5: The unexplained infant mortality rate is higher for low birthweight babies

Unexplained infant mortality rate by birthweight, England and Wales, 2004 to 2018

### Figure 5: The unexplained infant mortality rate is higher for low birthweight babies

Unexplained infant mortality rate by birthweight, England and Wales, 2004 to 2018



Source: Office for National Statistics - Deaths in England and Wales

#### Notes:

1. Figures are based on death occurrences.
2. Data for 2018 are provisional.
3. Low birthweight babies are those born weighing less than 2,500 grams.
4. Normal birthweight babies are those weighing 2,500 grams and over.

## 7. Unexplained infant deaths by registration type and parents' occupation

In 2018, the unexplained infant mortality rate was highest for babies whose birth was registered as a sole registration (one parent) outside marriage or civil partnership at 1.14 deaths per 1,000 live births. The lowest rate was for babies whose birth was registered by two parents inside marriage or civil partnership at 0.13 deaths per 1,000 live births (Figure 6).

Since 2004, the unexplained infant mortality rate has decreased for all registration types, however the rate is more consistent for babies whose birth was registered by two parents inside marriage or civil partnership.

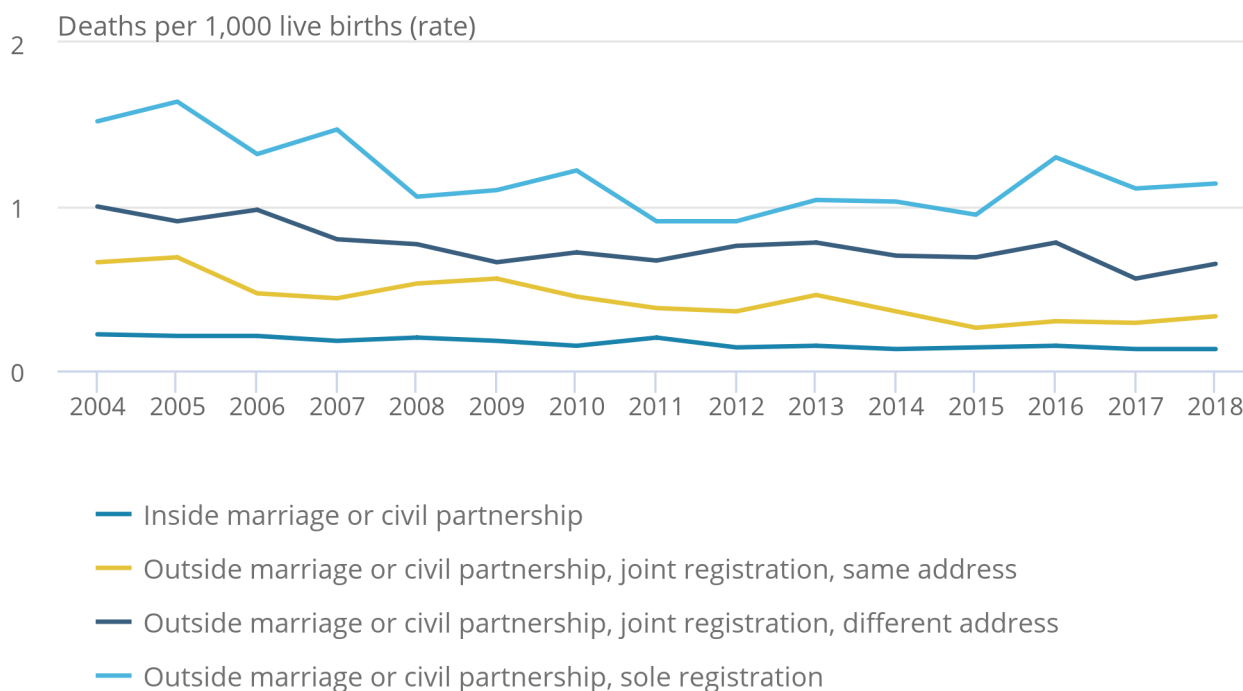
Maternal age is a known risk factor for infant mortality and may partially explain the differences between these groups. As can be seen in [Births by parents' characteristics England and Wales 2018 \(XLS, 549KB\)](#), 11.7% of live births in the sole registration category were to those under 20 years, compared with 0.3% of live births in the inside marriage or civil partnership category.

**Figure 6: The unexplained infant mortality rate is higher for sole birth registrations**

Unexplained infant death rates by type of birth registration, England and Wales, 2004 to 2018

Figure 6: The unexplained infant mortality rate is higher for sole birth registrations

Unexplained infant death rates by type of birth registration, England and Wales, 2004 to 2018



Source: Office for National Statistics - Deaths in England and Wales

Notes:

1. Figures are based on death occurrences.
2. Data for 2018 are provisional.

The [National Statistics Socio-Economic Classification \(NS-SEC\)](#) provides an indication of socio-economic position of parents based on occupation.

In 2018 and every year since 2011, the unexplained infant mortality rate was highest for parents in routine and manual occupations. In 2018, this rate was 0.48 deaths per 1,000 live births.

Variations in unexplained infant mortality by socio-economic classification may be partly explained by higher levels of deprivation and [poorer maternal health](#) for certain socio-economic groups. Maternal age is also a known risk factor.

## 8 . Unexplained infant mortality data

### [Unexplained deaths in infancy, England and Wales](#)

Dataset | Released 3 September 2020

Annual data covering 2013 to 2018 on sudden infant deaths in England and Wales and deaths for which the cause remained unascertained after a full investigation.

### [Unexpected deaths in infancy in England and Wales](#)

Dataset | Released 3 September 2020

Annual data covering all infant deaths that were referred to a coroner for investigation, regardless of the cause of death.

### [Unexplained deaths in infancy, England and Wales](#)

Dataset | Released 2006 to 2012

Historical reports on unexplained infant deaths in England and Wales, which includes sudden infant deaths and deaths for which the cause remained unknown or unascertained.

## 9 . Glossary

### **Infant**

Deaths under one year.

### **Neonatal**

Deaths under 28 days.

### **Postneonatal**

Deaths between 28 days and one year.

### **Sudden infant deaths**

Coded to the International Classification of Diseases tenth revision (ICD-10) code R95 “sudden infant death syndrome (SIDS)”, which includes any mention of “sudden infant death”, “cot death”, “SIDS”, “crib death”, or another similar term anywhere on the death certificate.

### **Unascertained deaths**

Coded to the ICD-10 code R99 “other ill-defined and unspecified causes of mortality”, which includes cases where the only mention on the death certificate is unascertained death.

## 10 . Measuring the data

Important information for interpreting these unexplained deaths in infancy statistics:

- Birth and death statistics are compiled from information supplied when births and deaths are certified and registered as part of civil registration, a legal requirement.
- Figures represent infant deaths (deaths under one year of age) that occurred in England and Wales in the calendar year shown; these include infant deaths whose mother's usual residence was outside England and Wales.
- Unexplained infant deaths include sudden infant deaths ("cot deaths") coded to the International Classification of Diseases Tenth Revision (ICD-10) code R95, and unascertained deaths (ICD-10 code R99); the latter are infant deaths where no medical cause was recorded.
- Unexplained infant deaths are identified by whether there was any mention of sudden infant deaths (ICD-10 code R95) or only a mention of the cause being unascertained (ICD-10 code R99) on the death certificate.
- Figures for unexplained infant deaths are available from 2004 onwards.
- Infant deaths are linked to their corresponding birth registration to enable analysis of risk factors and demographic characteristics such as birthweight, maternal age, mother's country of birth, parents' socio-economic classification and the number of previous children.

### Reference period

Figures in the [unexplained deaths in infancy tables](#) contain figures on deaths that occurred in the calendar year. Figures are available from 2004 onwards. Figures in these tables include both sudden infant deaths and unascertained deaths. The live birth numbers in these tables are based on all births that occurred in the reference year, plus any late birth registrations from the previous year.

Figures are based on occurrences data available up to 28 June 2020 and will not match those published in the [child mortality in England and Wales](#) release because of the time at which the extract was taken. Figures for 2017 have been finalised and figures for 2018 are provisional and will be finalised in the next annual release.

Unexplained infant deaths are referred to a coroner who may order a post-mortem or full inquest to ascertain the reasons for the death. The coroner can only register the death once any investigation is concluded and they are satisfied that the death has been thoroughly investigated with a correctly certified cause of death. The time taken to investigate the circumstances of the death can often result in a delay in death registration. While registration delays are commonly only a few days, they can occasionally extend into years. Therefore, we publish provisional figures to allow for late death registrations.

### Significance test

Statistically significant means that there is only a 1 in 20 chance (or less) that the difference was caused by random fluctuations in the data. This is enough to convince us that the difference is likely to be a real change.

Within this bulletin, a change that is described as statistically significant has primarily been assessed using confidence intervals. For infant mortality data where we have all the death records, they help tell the difference between a change caused by random fluctuations between years and a real change in the infant mortality rate.

## International comparisons

Internationally, data are available across different countries for sudden infant deaths (SIDs) and sudden unexpected infant deaths (SUID). [Analysis](#) shows that in general, sudden infant death rates have gradually declined over time in different countries, which is likely to be because of raised awareness of safer sleeping practices.

However, because of definitional and diagnostic differences between countries, international comparisons of unexplained infant death rates are difficult to produce. For example, since 2004 unexplained infant deaths statistics for England and Wales include ICD-10 codes R95 and R99, because of [evidence](#) that coroners use the term “sudden infant death” and “unascertained” interchangeably. In the [United States](#) however, infant deaths caused by sudden infant death syndrome, an unknown cause, or accidental suffocation or strangulation in bed are grouped together to produce an overall rate of sudden unexpected infant deaths.

More research is needed to establish how infant deaths by unexplained causes can be accurately compared across countries.

## 11 . Strengths and limitations

### Quality

Information on strengths, limitations, appropriate uses, and how the data were created is available in the [Unexplained deaths in infancy, England and Wales QMI](#). Our [User guide to child and infant mortality statistics](#) provides further information on data quality, legislation and procedures relating to child mortality and includes a glossary of terms.

### National Statistics status for infant mortality

National Statistics status means that our statistics meet the highest standards of trustworthiness, quality and public value, and it is our responsibility to maintain compliance with these standards.

Date of most recent [full assessment \(PDF, 152KB\)](#): May 2012.

Most recent [compliance check \(PDF, 152KB\)](#), which confirms National Statistics status: May 2012. Improvements since last review:

- ran a user consultation in 2017 to improve presentation and to meet our user needs, details of which are available in the [response](#) to the consultation
- updated our analysis on the [impact of registration delays on mortality statistics](#)
- updated our [policy for protecting confidentiality in tables of births and deaths statistics](#)

### Coding cause of deaths

Deaths are cause coded using the World Health Organization’s (WHO) International Classification of Diseases Tenth Revision (ICD-10). Deaths are coded to ICD-10 using IRIS software (version 2013).

## 12 . Related links

### [Health Statistics Quarterly, No. 39](#)

Report | Released Autumn 2008

Data covering trends in UK health and containing commentary on health findings, topical articles illustrated with colour charts and diagrams, statistical graphs and tables up until 2008.

### [Child and infant mortality in England and Wales](#)

Bulletin | Released 20 February 2020

Stillbirths, infant and childhood deaths occurring annually in England and Wales, and associated risk factors.

### [Deaths registered in England and Wales](#)

Bulletin | Released 1 July 2020

Registered deaths by age, sex, selected underlying causes of death and the leading causes of death.

Contains death rates and death registrations by area of residence and single year of age.

### [Births in England and Wales](#)

Bulletin | Released 22 July 2020

Live births, stillbirths and the intensity of childbearing, measured by the total fertility rate.

### [Stillbirths and Infant Deaths Section of the Registrar General Annual Report](#)

Bulletin | Released 6 November 2019

Data for Northern Ireland on stillbirths and infant deaths based on registrations.

### [Vital Events Reference Tables for Scotland](#)

Tables | Released 2020

Data for Scotland on stillbirths and infant deaths based on registrations.