Office for National Statistics

Statistical bulletin

Unexplained deaths in infancy, England and Wales: 2017

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 183 unexplained infant deaths in England and Wales in 2017, a decrease of 19.0% compared with 2016, but only 6.2% lower than in 2015.
- The unexplained infant mortality rate has decreased from 0.50 deaths per 1,000 live births in 2004 when records began, to 0.27 in 2017, the lowest on record.
- Unexplained infant deaths accounted for 6.9% of all infant deaths occurring in 2017, falling from 8.5% in 2016 and 7.6% in 2015.
- Just over half (55.2%) of all unexplained infant deaths were boys in 2017 (101 deaths).
- The rate of unexplained infant deaths was five times higher among low birthweight babies (less than 2,500 g) than babies with a normal birthweight (2,500g and over) in 2017.

2 . Statistician’s comment

“The rate at which babies died from an unexplained cause before their first birthday fell to the lowest level on record in 2017 – almost halving since records began in 2004. The new low comes after our last set of figures showed an increase between 2015 and 2016, and re-establishes the long-term trend. The fall in unexplained deaths may be due to factors such as fewer expectant mothers smoking and more awareness of safer sleeping practices.”

Rabiya Nasir, Vital Statistics Outputs Branch, Office for National Statistics

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3 . Things you need to know about this release

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.
- 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 maternal age and birthweight.

4 . Decrease in the number of unexplained infant deaths in England and Wales in 2017

There were 183 unexplained infant deaths that occurred in England and Wales in 2017. This is the lowest number recorded and a decrease of 19.0%, compared with 226 in 2016. It is also slightly lower than the 195 unexplained infant deaths in 2015.

Unexplained infant deaths are made up of sudden infant deaths and unascertained deaths. The decrease since 2016 was largely driven by a decline in unascertained deaths and is in the context of a 0.6% decrease in the total number of infant deaths that occurred in 2017. Deaths are assigned with the underlying cause of unascertained where there is no clear evidence of sudden infant death syndrome (or any other cause of death).

In 2017, unexplained infant deaths accounted for 6.9% of all infant deaths compared with 8.5% in 2016 and 7.6% in 2015.

5 . Gradual decline in the unexplained infant mortality rate since 2004

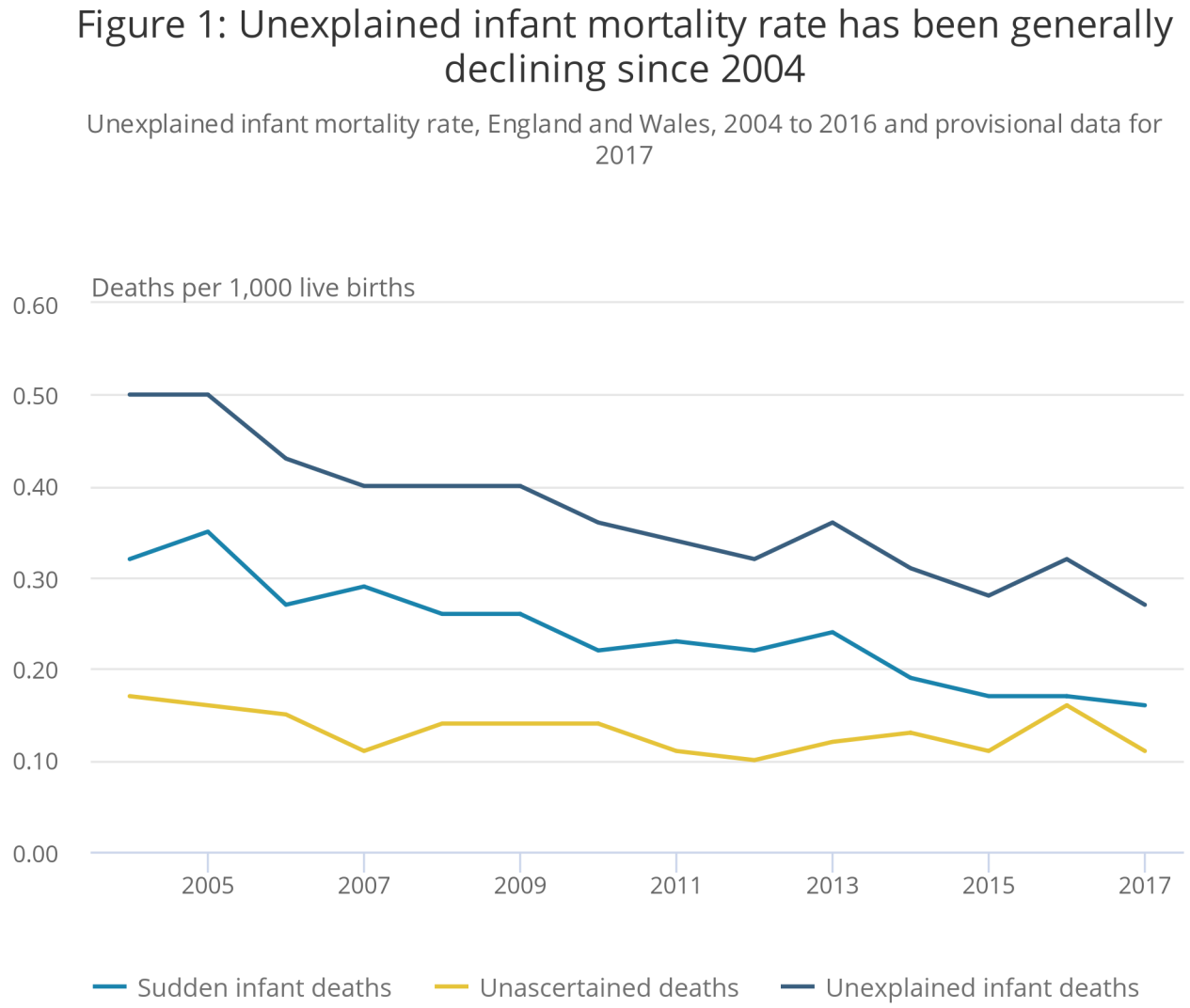
The unexplained infant mortality rate is a better measure for monitoring change over time than the actual number of deaths. It takes into account the number of live births each year, and this varies.

The unexplained infant mortality rate has nearly halved from 0.50 deaths per 1,000 live births in 2004 to 0.27 deaths per 1,000 live births in 2017. The rate of 0.27 in 2017 is the lowest on record (Figure 1). This decline is statistically significant.

There have been some fluctuations in this downward trend since 2004 including in 2016, which had the highest rate seen since 2013.

Figure 1: Unexplained infant mortality rate has been generally declining since 2004

Unexplained infant mortality rate, England and Wales, 2004 to 2016 and provisional data for 2017



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

Notes:

1. Figures are based on death occurrences.
2. Data for 2017 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.

Looking at the composition of unexplained infant deaths in 2017, the majority (59.6%) were recorded as sudden infant deaths and 40.4% were recorded as unascertained. The sudden infant death rate and unascertained infant death rate were 0.16 and 0.11 deaths per 1,000 live births respectively.

Unexplained infant mortality rates varied by regions in England, and Wales. In 2017, the North East region recorded the highest rate at 0.40 deaths per 1,000 live births, while London and the East of England had the lowest (0.16 deaths per 1,000 live births respectively). Unexplained infant mortality rates for regions are based on a relatively small number of deaths. Therefore, they are often subject to random fluctuations and are consequently less robust.

This overall decreasing trend in unexplained infant deaths could be driven by the advice and guidance that is available for parents from the NHS, Welsh Government (PDF, 295.87KB), and charities such as The Lullaby Trust . For example, since 2015, The Lullaby Trust has held an annual awareness Safer Sleep Week Campaign promoting safer sleep advice, where a number of health authorities participated to raise public awareness. The Lullaby Trust has also trained health professionals working with new and expectant parents how to advise on safer sleep practices.

Other factors have also been associated with a higher risk of unexplained death in infancy:

- Maternal smoking during pregnancy and postnatal exposure to tobacco smoke have been associated with unexplained infant deaths. Research shows that babies whose mothers smoke have an increased risk of sudden infant death syndrome, compared with babies whose mothers do not smoke. The level of risk is greater with increasing levels of maternal smoking. Recent official statistics show that fewer women now smoke at the time of delivery.

- Overheating and an unsafe sleeping environment, such as the baby's head being covered, have also been linked with unexplained infant deaths. These situations may be more likely to occur during winter through the use of extra clothing or blankets, and central heating at night. Further risk factors include sleeping position, not breastfeeding, temperature and sleep environments including unplanned bed-sharing and sleeping with a baby on a sofa.

6 . Proportion of unexplained infant deaths among boys in England and Wales increased in 2017

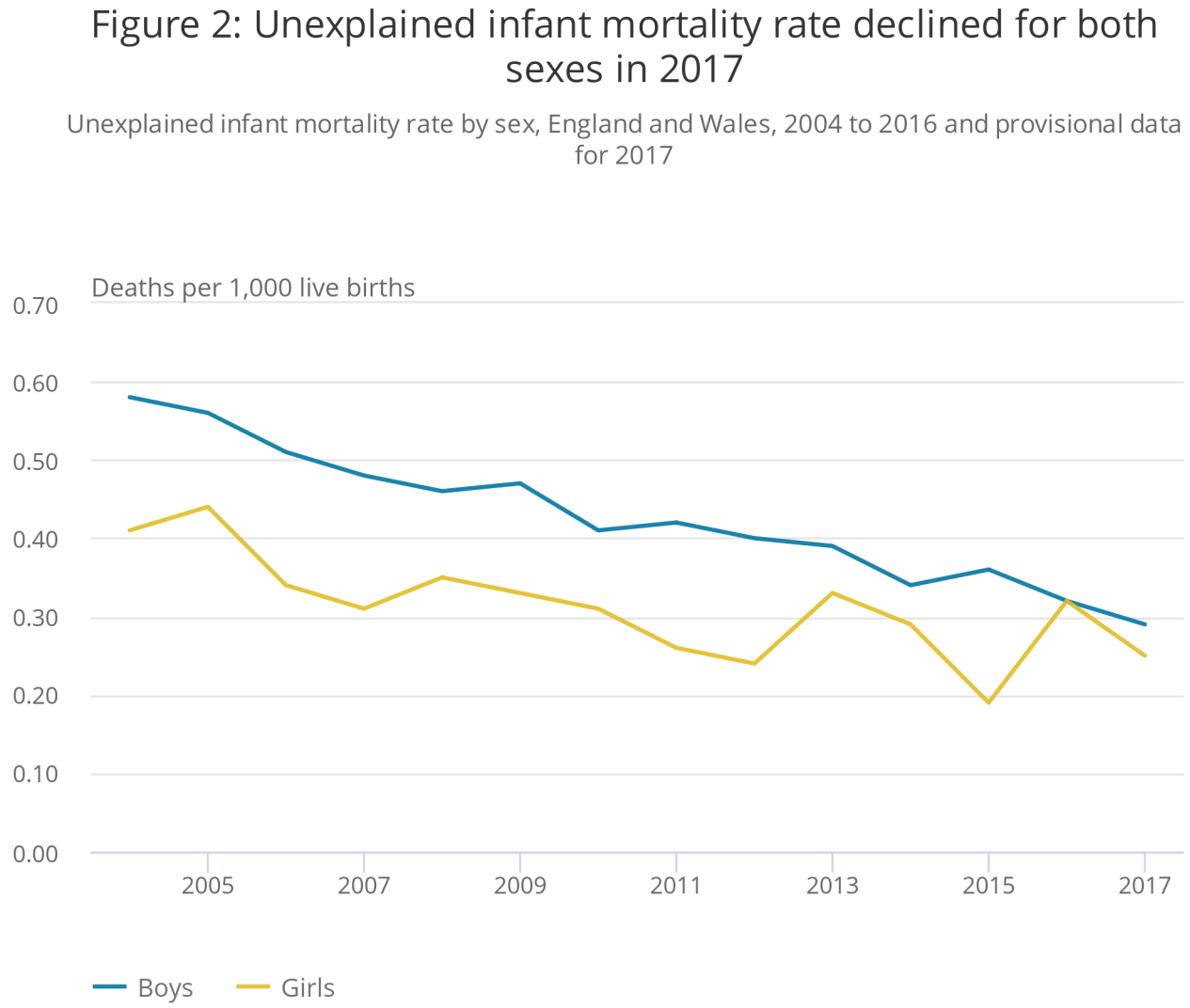
Overall, boys are at greater risk of an unexplained infant death than girls. In 2017, boys accounted for 55.2% of unexplained infant deaths, an increase from 51.3% compared with the previous year.

Similarly, the unexplained infant mortality rate was higher for boys at 0.29 deaths per 1,000 live births compared with girls (0.25 deaths per 1,000 live births) in 2017. This is consistent with the overall trend, where the unexplained infant mortality rate was higher for boys than girls each year since 2004, except for 2016 where the rate for both sexes was the same (Figure 2).

The unexplained infant mortality rate for both boys and girls has fallen since 2004. While this decrease has been quite consistent for boys, there has been greater fluctuation in rates for girls (Figure 2).

Figure 2: Unexplained infant mortality rate declined for both sexes in 2017

Unexplained infant mortality rate by sex, England and Wales, 2004 to 2016 and provisional data for 2017



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

Notes:

1. Figures are based on death occurrences.
2. Data for 2017 are provisional.

While the majority (72.2%) of all infant deaths are likely to occur in the first four weeks after birth (neonatal period), unexplained infant deaths are more likely to happen later in infancy. In 2017, more than four-fifths (82.0%) of all unexplained infant deaths occurred in the postneonatal period (at least 28 days but less than 1 year after birth), a small increase from 81.0% in the previous year.

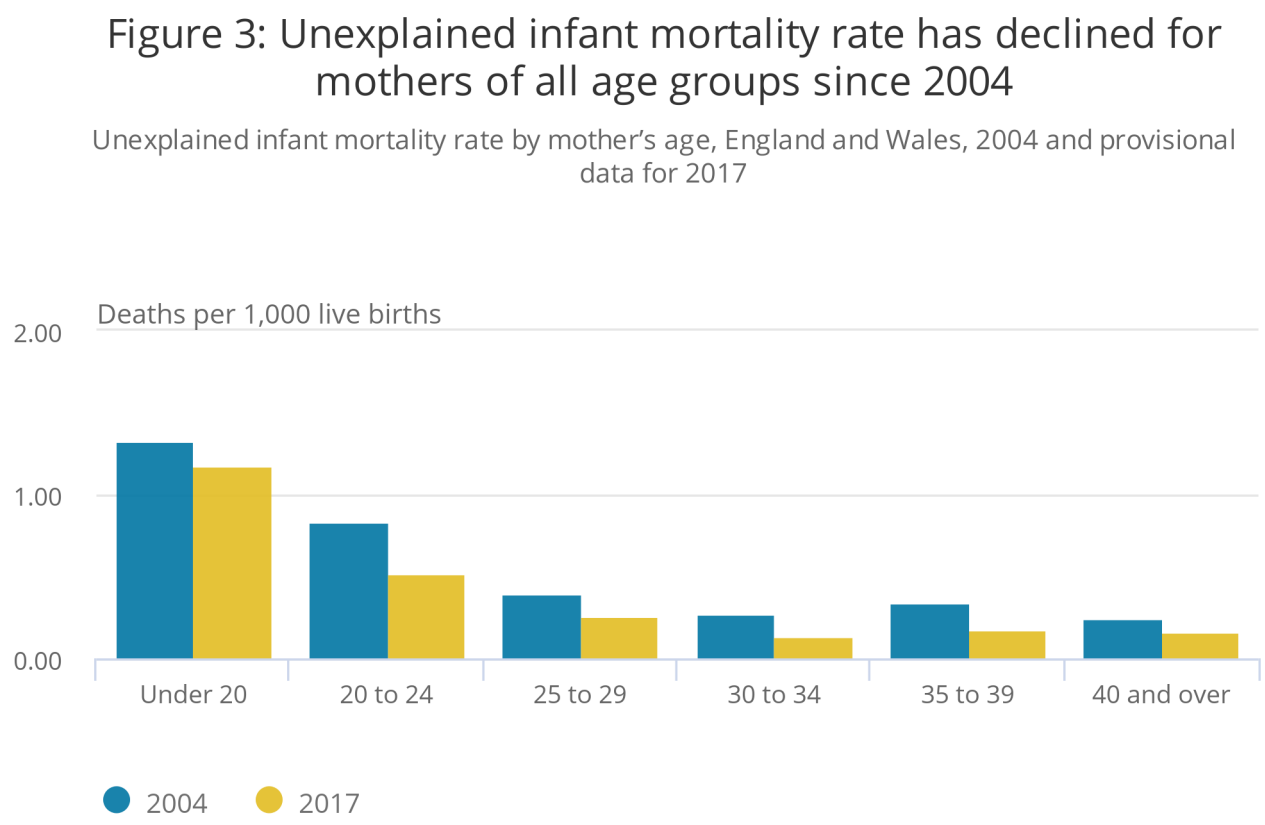
7 . Unexplained infant mortality rate is generally higher for younger mothers

Maternal age is a risk factor for infant mortality generally, and this holds true for unexplained deaths. In 2017, the unexplained infant mortality rate was highest for mothers aged under 20 years at 1.18 deaths per 1,000 live births, while the lowest rate was among mothers aged 30 to 34 years at 0.14 deaths per 1,000 live births.

Since 2004, the unexplained infant mortality rate has decreased for mothers of all age groups, although the size of the decrease has varied by age. Over this period, the largest decline was seen for mothers aged 30 to 34 years where the rate fell by 50.0% (Figure 3), a statistically significant decrease. In contrast, the smallest decline was for mothers aged under 20 years where the unexplained infant mortality rate fell by 11.3% from 2004. This decrease was not statistically significant.

Figure 3: Unexplained infant mortality rate has declined for mothers of all age groups since 2004

Unexplained infant mortality rate by mother's age, England and Wales, 2004 and provisional data for 2017



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

Notes:

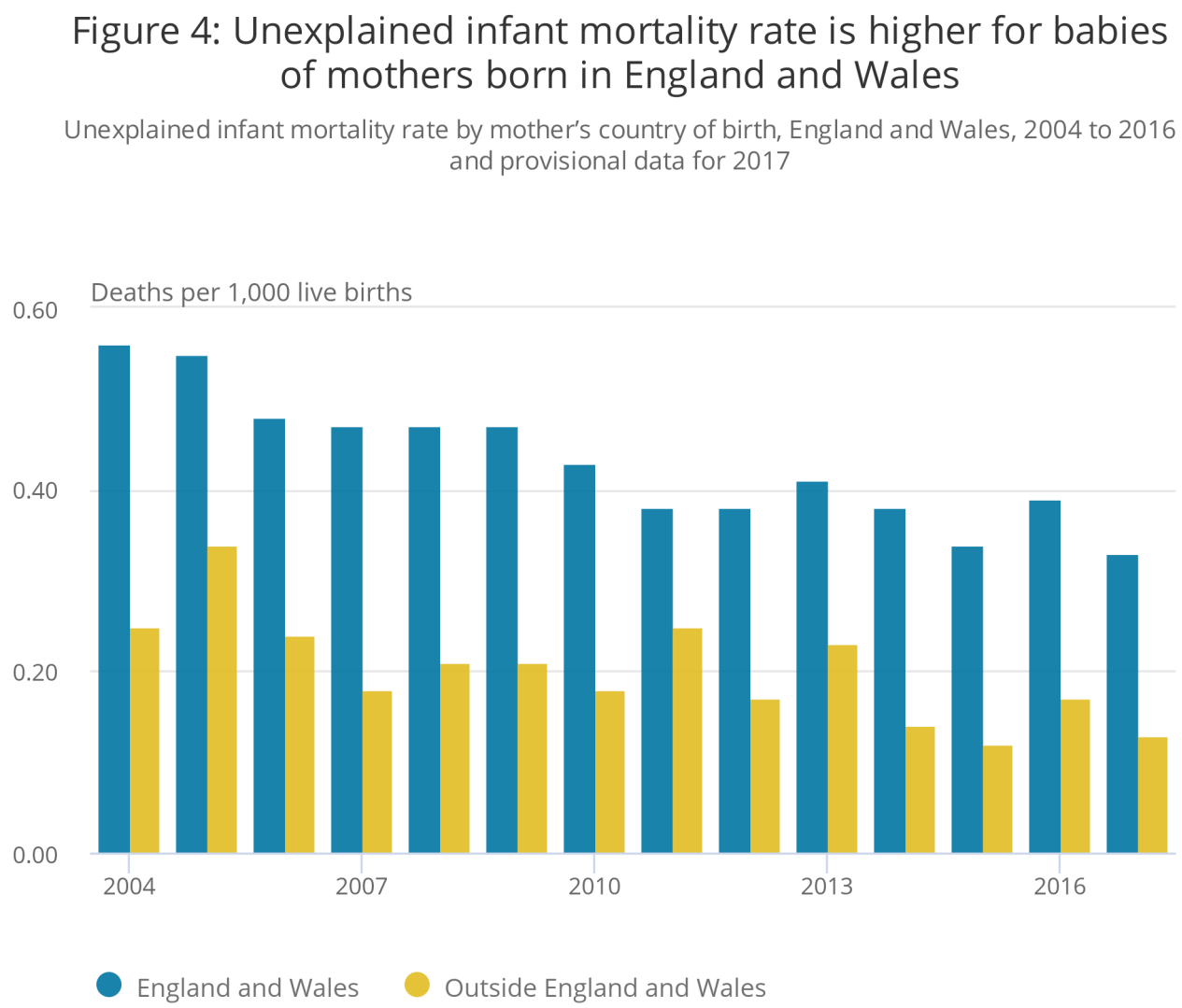
1. Figures are based on death occurrences.
2. Data for 2017 are provisional.

8 . Unexplained infant mortality rate is twice as high for babies of mothers born in England and Wales in 2017

In 2017, the unexplained infant mortality rate for babies of mothers born in England and Wales was more than twice the rate for babies of mothers born in other countries. The rates were 0.33 deaths per 1,000 live births and 0.13 deaths per 1,000 live births respectively. This pattern of higher rates for babies of mothers born in England and Wales has been observed for all years since 2004 and, except for 2005, 2011 and 2013, the rate has been more than double the rate for babies of mothers born outside of England and Wales (Figure 4).

Figure 4: Unexplained infant mortality rate is higher for babies of mothers born in England and Wales

Unexplained infant mortality rate by mother's country of birth, England and Wales, 2004 to 2016 and provisional data for 2017



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

Notes:

1. Figures are based on death occurrences.
2. Data for 2017 are provisional.

Although it is not possible to say why this is the case, it may be partly because of differences in maternal age between the two groups.

Age of mother is a risk factor that is commonly associated with unexplained infant deaths, and younger mothers are more likely to experience an unexplained infant death. In 2017, the average age of mothers born in England and Wales who gave birth during the year was 29.6 years; this compares with 31.3 years for mothers who were born outside England and Wales.

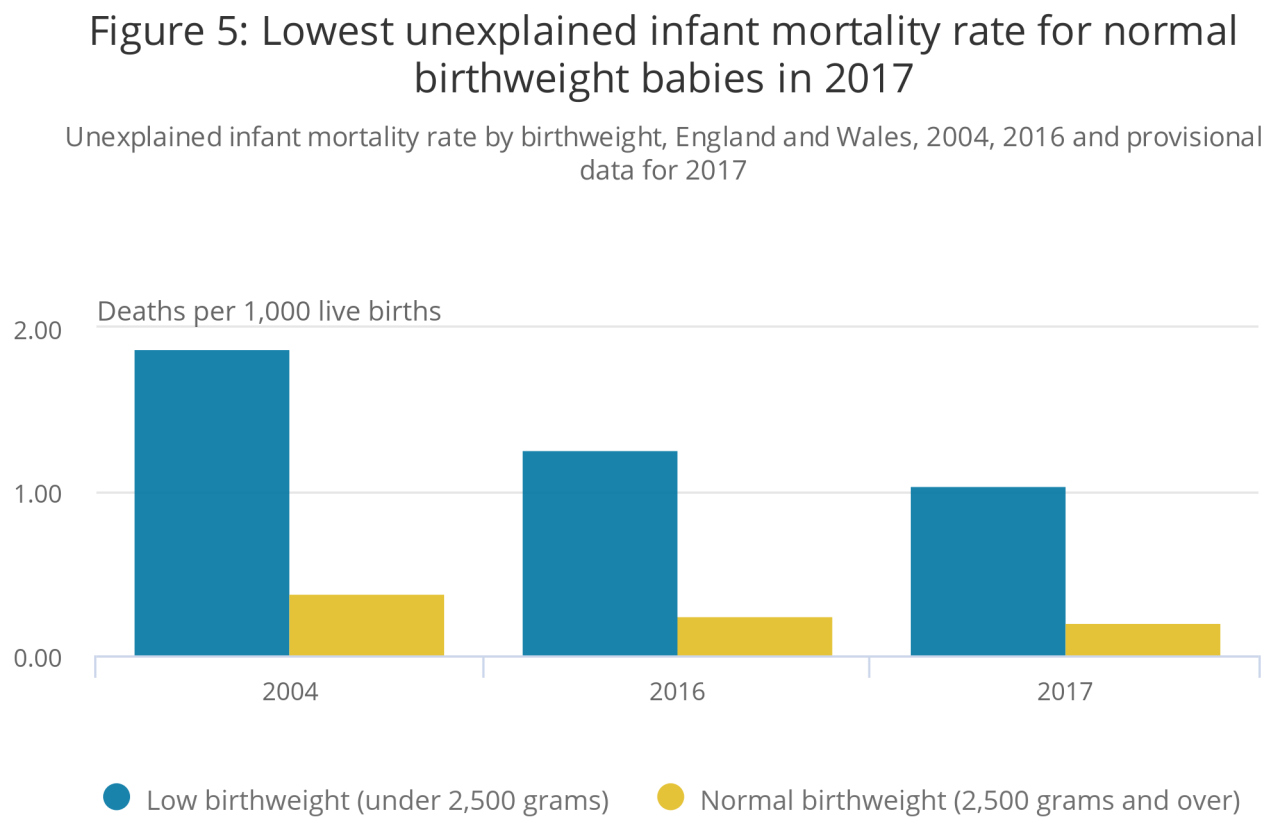
9 . Unexplained infant mortality rate is highest for low birthweight babies in 2017

Low birthweight is associated with higher infant mortality, premature birth and other factors affecting fetal growth during pregnancy, such as maternal smoking. In 2017, the unexplained infant mortality rate for low birthweight babies (under 2,500 grams) was 1.04 deaths per 1,000 live births. This was five times higher than babies with normal birthweight (2,500 grams and over) at 0.20 deaths per 1,000 live births (Figure 5).

Between 2004 and 2017, the unexplained infant mortality rate decreased for both low and normal birthweight babies. Over this period, the rates for both groups fell by a similar amount with decreases of 44.4% and 47.4% respectively. However, the unexplained infant mortality rate for low birthweight babies has consistently remained about five times higher than for babies of normal birthweight.

Figure 5: Lowest unexplained infant mortality rate for normal birthweight babies in 2017

Unexplained infant mortality rate by birthweight, England and Wales, 2004, 2016 and provisional data for 2017



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

Notes:

1. Figures are based on death occurrences.
2. Data for 2017 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.

10 . Links to related statistics

Earlier data on unexplained deaths in infancy for 2006 to 2012 and 2013 to 2016 are available.

Earlier reports for unexplained deaths in infancy for before 2006 were published annually in the autumn edition of Health Statistics Quarterly.

More data on child mortality (death cohort) tables in England and Wales and infant mortality (birth cohort) tables in England and Wales are available.

Infant mortality statistics for Scotland and Northern Ireland are the responsibility of National Records of Scotland (NRS) and the Northern Ireland Statistics and Research Agency (NISRA) respectively.

More data on births and deaths (based on deaths registered in a calendar year) in England and Wales in 2018 are available.

11 . Quality and methodology

Quality and methodology information

The Unexplained deaths in infancy Quality and Methodology Information report and the Child and infant mortality Quality and Methodology Information report contains important information on:

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

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.

Definitions used in infant mortality statistics

- Stillbirth – born after 24 or more weeks completed gestation and which did not, at any time, breathe or show signs of life.
- Early neonatal – deaths under 7 days.
- Perinatal – stillbirths and early neonatal deaths.
- Neonatal – deaths under 28 days.
- Late neonatal – deaths after 7 days and under 28 days.
- Postneonatal – deaths between 28 days and 1 year.
- Postperinatal – late neonatal and postneonatal deaths.
- Infant – deaths under 1 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.

Reference period

The live birth and stillbirth numbers are based on all births that occurred in the reference year, plus any late birth registrations from the previous year.

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.

Figures are based on occurrences data available up to 28 June 2019 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 2016 have been finalised and figures for 2017 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 which 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. If the confidence interval around a figure does not overlap with the interval around another, we can say with more confidence that the difference is likely to be a real change rather than simply down to chance.

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). Cause of death reported here represents the final underlying cause of death for ages 28 days and over. This takes account of additional information received from medical practitioners or coroners after the death has been registered.

Other

Linking infant deaths to their corresponding birth registration improves our understanding of the main characteristics of the baby and the baby's parents (these include the baby's birthweight, mother's age, mother's country of birth, parents' socio-economic classification, and the number of previous children).