Statistical bulletin

Child and infant mortality in England and Wales: 2019

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

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1. Main points

- In 2019, 2,390 infant deaths (aged under 1 year) and 907 child deaths (aged 1 to 15 years) occurred in England and Wales; these are the lowest numbers of infant and child deaths since records began in 1980.

- In 2019, the infant mortality rate was 3.7 deaths per 1,000 live births in England and Wales; while this follows a general decline since 1980 over the last five years the infant mortality rate has remained fairly stable.

- In 2019, the neonatal mortality rate (aged under 28 days) was 2.8 deaths per 1,000 live births in England and Wales; this rate has remained the same since 2017.

- The increase in the proportion of live births under 24 weeks completed gestation has contributed to an increase in the neonatal mortality rate from 2.5 deaths per 1,000 live births in 2014 to 2.8 in 2019.

Statistician’s comment

“Despite a decrease in the number of infant deaths in England and Wales in 2019, over the last five years the infant mortality rate has remained fairly stable. And for the third consecutive year, the neonatal mortality rate has not changed.

“Infant mortality is affected by a combination of risk factors such as gestation length and mother’s age, which can have an impact on the health of mothers and their babies. Today’s analysis shows that a continued increase in babies born under 24 weeks in 2019 has continued to affect the overall neonatal and infant mortality rates.

“Understanding how these factors affect trends in infant mortality is important for policymakers and health practitioners to target interventions and monitor progress against the government ambition in England to halve 2010’s stillbirth and neonatal mortality rates by 2025.”

Gemma Quayle, Vital Statistics Outputs Branch, Office for National Statistics
Follow Vital Statistics Outputs Branch on Twitter @SarahCaul_ONS

2. Trends in child and infant mortality

There were 907 child deaths (aged 1 to 15 years) in 2019 for England and Wales, which is the lowest on record. This is a rate of 8 deaths per 100,000 population of the same age. The rate of child deaths has fallen steadily since 1981 when there were 33 child deaths per 100,000 population of the same age.

A total of 2,390 infant deaths occurred in England and Wales in 2019. This is the lowest number of deaths on record but is not unexpected given the falling birth rate in England and Wales. The infant mortality rate, which takes the number of births into account so different years can be better compared, was 3.7 deaths per 1,000 live births in 2019. This rate has remained fairly stable in recent years following on from a general decline since 1980 (Figure 1).

The overall decline in infant mortality rates in recent decades likely reflects general improvements in healthcare and more specific improvements in midwifery and neonatal intensive care.
In 2019, the South West had the lowest rate of infant mortality of 2.6 deaths per 1,000 live births whilst the West Midlands had the highest rate of 5.3 deaths per 1,000 live births (Figure 2). Between 2010 and 2019, the East and South West regions had an infant mortality rate consistently below the rate for England and Wales. In contrast, the West Midlands and North West had an infant mortality rate consistently above the rate for England and Wales.
**Figure 2: West Midlands had a consistently higher rate of infant mortality than the national rate for England and Wales**

Infant mortality rate for Wales and regions in England, 2010 to 2019

**Notes:**

1. Deaths occurring in a calendar year.
2. Infant – deaths of those aged under 1 year.
3. Rates – infant (aged under 1 year) deaths per 1,000 live births.
4. Based on area of usual residence. Geographical boundaries for 2019 are based on boundaries as of May 2020. For earlier years, boundaries are based on those available at time of annual publication.

Download the data

.xlsx

**3. Neonatal mortality and gestation length**

Gestational age is a main risk factor for neonatal mortality. Since 2007, the first year data are available by gestational age, the neonatal mortality rate in England and Wales decreased from 3.3 to 2.5 deaths per 1,000 live births in 2014. The rate then increased to 2.8 deaths per 1,000 live births in 2017 and has remained at this level to 2019 (Figure 3).

One factor contributing to the trend in the neonatal mortality rate has been a small increase in the number of babies born alive at under 24 weeks gestation, despite a decrease in the overall number of births. In 2019, the proportion of live births where gestational age was under 24 weeks increased to 0.15% compared with 0.13% in 2018 and 0.10% in 2010. Sadly, these extremely premature babies are likely to only survive a short time with 84.0% of all the neonatal deaths of babies born below 24 weeks gestation occurring within a day of the birth.

To assess how much the increase in live births under 24 weeks has affected neonatal mortality, Figure 3 compares the overall neonatal mortality rate to rates that only include babies born at 24 weeks or over. For this gestational age group, the neonatal mortality rate has decreased since 2015 from 1.7 deaths per 1,000 live births to 1.4 deaths per 1,000 live births in 2019. This indicates that the recent increase in the overall rate can be attributed to the under 24 weeks group.
Figure 3: Increase in the overall neonatal mortality rate since 2014

Neonatal mortality rate, England and Wales, 2007 to 2019

Source: Office for National Statistics – Child and Infant Mortality in England and Wales: 2019

Notes:

1. Data are based on all infant deaths occurring in a calendar year. Analysis in previous years of infant mortality data by gestational age were based on all babies born in a calendar year who died before their first birthday. Trends will therefore be similar but not identical.

2. Neonatal – deaths of those aged under 28 days.

3. Rates – neonatal deaths per 1,000 live births.

Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK (MBRRACE-UK) presents figures on infant mortality that exclude births before 24 weeks gestational age. Therefore, the trend presented above for 24 weeks and over only is more comparable with their figures. However, the figures will still not fully align because of other methodological differences. Full information on the differences between the Office for National Statistics (ONS) and MBRRACE-UK data can be found in Section 10 of this release.

Another way of looking at this trend is by exploring the proportion of neonatal deaths that are accounted for by babies born under or over 24 weeks gestation (Figure 4). This provides further indication that the recent increase in the overall neonatal mortality rate could be driven by an increase in the number of live births of babies born under 24 weeks gestation.
One potential explanation for these trends is that more very preterm babies are being classified by health practitioners as live births, whereas in the past they may have been classified as a stillbirth (if 24 weeks or over) or a late fetal loss (if under 24 weeks). In November 2020, MBRRACE-UK published guidance for doctors and midwives for assessing signs of life for births under 24 weeks, where active survival-focused care may not be appropriate. Any impact of this new guidance on the number of extremely preterm live births will not be seen until 2021 births data are published.

Figure 4: The proportion of neonatal deaths to babies born at under 24 weeks completed gestation has increased since 2014

Percentage of neonatal deaths by gestational age groups, England and Wales, 2007 to 2019

Source: Office for National Statistics – Child and Infant Mortality in England and Wales: 2019

Notes:

1. Data are based on all infant deaths occurring in a calendar year. Analysis in previous years of infant mortality data by gestational age were based all babies born in a calendar year who died before their first birthday. Trends will therefore be similar but not identical.

2. Neonatal – deaths of those aged under 28 days.

3. Percentages for under 24 weeks and 24 weeks or over will not sum to 100 because there are some neonatal deaths where the gestational age is not known.
Length of life

The age of babies who died within the neonatal period can be broken down further by how long the baby lived. If there has been any change in clinical practice affecting whether a birth is recorded as a live birth or as a stillbirth (or late fetal loss before 24 weeks), this is likely to affect babies who survived the shortest time.

In 2019, there were 647 deaths to babies born under 24 weeks who died within one day, which makes up 84.0% of all neonatal deaths to babies born at this gestational age. This is a much larger percentage when compared with neonatal deaths of babies born at 24 weeks or over in 2019 where 33.2% (302) died within a day. For neonatal deaths of babies born under 24 weeks, 93.5% of them died within a week.

4. Stillbirth and neonatal mortality rates in England

There are government strategies and campaigns in England to halve stillbirth and neonatal mortality rates (aged under 28 days) by 2025 compared with 2010. Health is a devolved matter meaning it is the responsibility of the individual countries of the UK, which is why this ambition is only for England.

In 2019, the stillbirth rate in England reached its lowest level on record at 3.8 stillbirths per 1,000 births, a decrease from 5.1 stillbirths per 1,000 births in 2010. Achieving the ambition would mean reducing the stillbirth rate to 2.6 stillbirths per 1,000 births by 2025 (Figure 5). If the total number of births were to remain constant until 2025, this would require the number of stillbirths to fall from 2,346 in 2019 to 1,594 in 2025, a decrease of 752.

The neonatal mortality rate in England in 2019 was 2.7 deaths per 1,000 live births. This is the first year since 2014 that the neonatal mortality rate has decreased (not statistically significant), following three consecutive years between 2016 and 2018, where the neonatal mortality rate remained at 2.8 deaths per 1,000 live births (Figure 5). Achieving the ambition would mean reducing the neonatal mortality rate to 1.5 deaths per 1,000 live births by 2025. If the number of live births were to remain constant until 2025, this would require the number of neonatal deaths to fall from 1,674 in 2019 to 916 in 2025, a decrease of 758.

Neonatal mortality rates are affected by risk factors such as gestational age, specifically the number of babies born under 24 weeks gestation. Sadly, the majority of these babies do not survive the neonatal period given their extreme prematurity. Given the number of live births below 24 weeks has been increasing, it is useful to consider trends in neonatal mortality for babies born at 24 weeks or over in England separately.

The neonatal mortality rate in England in 2019 for babies born at 24 weeks and over was 1.4 deaths per 1,000 live births. This continues the gradual fall of mortality rates for this group that has happened since 2010, where the rate was 2.0 deaths per 1,000 live births. If the rate for this group were halved by 2025, this would mean the neonatal mortality rate would fall to 1.0 deaths per 1,000 live births. If the number of live births were to remain constant until 2025, this would require the number of neonatal deaths to babies born at 24 weeks or over to fall from 844 in 2019 to 608 in 2025, a decrease of 236.
Figure 5: Stillbirth rate continues to decline and neonatal mortality rate remains fairly stable since 2016

Stillbirths and neonatal mortality rates in England, 2010 to 2019

Source: Office for National Statistics – Child and Infant Mortality in England and Wales: 2019

Notes:

1. Deaths occurring in a calendar year.

2. Neonatal – deaths of those aged under 28 days.

3. Rates – stillbirths per 1,000 total births. Neonatal per 1,000 live births.

4. Stillbirth – a baby born after 24 or more weeks completed gestation and who did not, at any time, breathe or show signs of life.

Tables 19 to 21 of our death cohort tables present further data on neonatal mortality rates in England, broken down by gestational age. These can be used with overall trends in England to aid understanding of neonatal mortality in relation to the government ambition.

For comparison, the stillbirth and neonatal mortality rates in Wales in 2019 was slightly higher, at 4.6 per 1,000 births and 3.0 per 1,000 live births respectively. The neonatal mortality rate for babies born at 24 weeks and over in Wales was 2.1 per 1,000 live births in 2019. Tables 23 and 24 of our death cohort tables present data on neonatal mortality rates in Wales, broken down by gestational age.
5. Neonatal causes of death

The Office for National Statistics developed a hierarchical classification, which allows neonatal deaths to be assigned to a category, based on the likely timing of damage leading to death. The data are only comparable from 2014 onwards. More information can be found in our User guide to child and infant mortality statistics.

Over half of neonatal deaths in 2019 for England and Wales are caused by immaturity-related conditions (53.1%) such as respiratory and cardiovascular disorders. Congenital anomalies, such as heart and neural tube defects, account for approximately 30% of the total, followed by antepartum infections, which account for approximately 10% (Figure 6). Other neonatal deaths result from causes during or shortly after labour (intrapartum), or in the postnatal period.

Figure 6: Immaturity-related conditions remain the most common cause of neonatal deaths since 2014

Percentage of neonatal deaths caused by immaturity-related conditions, congenital anomalies and antepartum infections, England and Wales, 2014 to 2019

Source: Office for National Statistics – Child and Infant Mortality in England and Wales: 2019

Notes:

1. Deaths occurring in a calendar year.

2. Neonatal – deaths of those aged under 28 days.

3. The Office for National Statistics’ cause groups were revised in 2014, and therefore only figures since then are directly comparable.
For neonatal deaths of babies born at 24 weeks or more gestational age in England, congenital anomalies are the main contributor to the neonatal mortality rate of this group, followed by immaturity-related conditions. For more information, see Table 21 of our death cohort tables, which presents data on neonatal deaths of babies born at 24 weeks or more in England, by cause group.

6. Risk factors

Maternal age

Maternal age is another known risk factor for infant mortality. In 2019, the infant mortality rate was highest for mothers aged under 20 years at 5.0 deaths per 1,000 live births, a decrease from 5.6 deaths per 1,000 live births in 2010. As the number of live births in this age group has dropped by over 50% from 40,591 in 2010 to 17,720 in 2019, this is likely to have had a positive impact on the overall infant mortality rate.

Mothers aged 40 years or over are also considered a high-risk group for infant mortality, with the second-highest infant mortality rate in 2019 (Figure 7). Despite the infant mortality rate being relatively high within this age group, it has decreased the most since 2010, from 5.8 to 4.6 deaths per 1,000 live births. The number of live births has increased by approximately 7% from 27,731 in 2010 to 29,618 in 2019 in this age group. This small increase in births is likely to have a minimal impact on the overall infant mortality rate, especially given this age group has seen the largest decrease in the mortality rate.

In comparison, the infant mortality rate was lowest for mothers aged 30 to 34 years at 3.0 deaths per 1,000 live births in 2019.
Infant mortality rate by age of mother in England and Wales, 2010 and 2019

**Figure 7: Infant mortality rate for mothers of all ages declines since 2010**

**Infant mortality rate by age of mother in England and Wales, 2010 and 2019**

![Infant mortality rate by age of mother in England and Wales, 2010 and 2019](image)

**Source:** Office for National Statistics – Child and Infant Mortality in England and Wales: 2019

**Notes:**

1. Infant – deaths of those aged under 1 year.

**Birthweight**

From 2010 to 2014, there was a gradual decrease in the infant mortality rate for low birthweight babies (under 2,500 grams). However, the rate increased in subsequent years to 34.7 deaths per 1,000 live births in 2017. Since then, it has decreased to its lowest ever rate of 29.9 deaths per 1,000 live births in 2019.

In contrast, the infant mortality rate for normal birthweight babies (2,500 grams or over) has decreased gradually from 1.4 infant deaths per 1,000 live births in 2010 to 0.9 deaths per 1,000 live births in 2019.

**Other known risk factors**

There are a range of [other risk factors (PDF, 1.05MB)](link) associated with infant mortality rates that we are unable to assess from the data we currently have available. Examples of these include maternal health factors such as smoking, alcohol consumption and obesity.
7. Inequalities

Understanding and monitoring variation in infant mortality is important in order to better understand change over time and how different characteristics influence it. Using the data that we have available, we found that certain characteristics influence the survival chances of infants.

One characteristic is the index of multiple deprivation (IMD), which is an overall measure of deprivation based on factors such as income, employment, health, education, crime, the living environment and access to housing within an area. There are different measurements for England and Wales, which are not directly comparable.

Infant mortality rates are significantly higher in the 10% most deprived compared with the 10% least deprived in England, and this difference has remained relatively constant since 2010. In Wales, it is difficult to detect a clear trend since 2010 because the number of infant deaths is relatively small. Rates are therefore subject to random fluctuations and are consequently less robust.

The National Statistics Socio-economic Classification (NS-SEC) provides an indication of socio-economic position based on occupation of the parents. The infant mortality rate for routine and manual occupations was highest at 4.7 deaths per 1,000 live births in 2019. It was lowest in the higher managerial, administrative and professional occupation at 2.9 deaths per 1,000 live births. Despite some fluctuations, this pattern has remained constant since 2011.

As part of our work to improve and develop childhood health statistics, we are currently undertaking a project to assess how we produce statistics on births and infant mortality by ethnicity using information collected on the birth notification. This work involves evaluating the quality of the ethnicity variable on the NHS birth notification and reviewing how the data are categorised in comparison with the Census 2021 question on ethnicity.

Existing data on infant mortality and ethnicity are routinely published in our infant mortality (birth cohort) tables. We plan to publish an article that brings together the findings of our review and presents data on births and infant mortality using updated ethnic groupings.

8. Child and infant mortality data

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<td></td>
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<tr>
<td>Infant mortality (birth cohort) tables in England and Wales</td>
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9. Glossary

Stillbirth

A baby born after 24 or more weeks completed gestation and which did not, at any time, breathe or show signs of life.
Early neonatal
The death of an infant aged under 7 days.

Perinatal
A baby who was recorded as either a stillbirth or early neonatal death.

Neonatal
The death of an infant aged under 28 days.

Postneonatal
The death of an infant aged between 28 days and 1 year.

Infant
The death of those aged under 1 year.

Child
The death of those aged between 1 and 15 years.

10 . Measuring the data

Differences between ONS and MBRRACE-UK figures

The Office for National Statistics (ONS) figures on perinatal mortality are based on all births and deaths registered via the General Register Office regardless of gestational age, and all stillbirths registered at 24 weeks or more gestation in line with the Stillbirth (Definition) Act 1992. [Stillbirth (Definition) Act 1992]

Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK (MBRRACE-UK) figures on stillbirth and neonatal mortality rates exclude births below 24 weeks gestational age, and also exclude births that resulted in a death following termination of pregnancy. MBRRACE-UK excludes these births and deaths for the following reasons:
1. Using this definition is consistent with the gestational age cut-off for stillbirths. MBRRACE-UK’s main focus is reporting on extended perinatal deaths (stillbirth and neonatal death), so it seems logical to use the same gestational age threshold used to legally define stillbirths in the UK for early neonatal deaths, that is 24 weeks.

2. As babies born showing no signs of life before 24 weeks (late fetal losses) are not legally required to be registered in the UK, MBRRACE-UK cannot validate ascertainment using registration data that the ONS share with them.

3. Historically there has been wide variation in whether NHS trusts and health boards report births before 24 weeks as a late fetal loss (that will not be reflected in ONS birth or death registration figures) or as live births resulting in neonatal deaths (registered as both a birth and a death). This variation in registration practice resulted in MBRRACE-UK’s decision to focus on births at 24 weeks gestational age or above, which has been the case since their first Perinatal Surveillance Report reporting deaths in 2013 (PDF, 22.0 MB).

4. MBRRACE-UK mortality rates exclude stillbirths and neonatal deaths following termination of pregnancy to minimise the impact because of policy differences in the provision and timing of antenatal screening and population differences in the uptake of Termination of Pregnancy because of Fetal Anomaly (TOPFAs) between organisations.

11. Strengths and limitations

More information on the strengths, limitations and accuracy of the data is available in the Child and infant mortality statistics Quality and Methodology Information (QMI) report.

Our User guide to child and infant mortality statistics provides further information on data quality, legislation and procedures relating to mortality and includes a glossary of terms.

National Statistics status for Child and 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.

Most recent full assessment report (PDF, 152MB): May 2012
Most recent compliance check (PDF, 152MB), 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
Coronavirus and child and infant mortality statistics

The data in this publication are not affected by the coronavirus (COVID-19) pandemic as they relate to deaths for the year ending 31 December 2019. In normal circumstances, deaths are typically registered within five days however, in the case of infant deaths, this delay can be much longer if the death requires coroner investigation. As a result, our annual death cohort for infant deaths occurring in 2019 includes infant deaths registered before 29 September 2020. This is unlikely to have a large impact on the number of infant deaths recorded in our 2019 death cohort but this is being monitored. For more information, please see our User guide to child and infant mortality statistics.

It is possible that registration delays for infant deaths have been longer than normal and infant deaths that occurred in 2019 may have not yet been captured by the data included in this release. Next year, we will have a more accurate picture of late death registrations during 2020, for deaths that occurred in 2019.

In line with the Office for National Statistics’ (ONS’) response on the production of statistics during the pandemic, we are monitoring the implications of any delays in 2020 death registrations and exploring the possibility of using alternative data sources to estimate 2020 deaths data in a more timely manner.

Linkage of births and deaths

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.

In 2019, 96.9% of infant deaths in England and Wales were successfully linked to their birth registration record. The linkage rate has remained consistent since the linking exercise began. The main reasons for an infant death not being linked are either a birth registration record cannot be found or the birth was registered outside England and Wales.

In addition to linking infant deaths to birth registration records, accompanying death cohort data have also been linked to their corresponding birth notification. This linkage was conducted to produce more timely statistics on infant mortality by gestational age, for which information is only available on the birth notification. Section 4.3 of the User guide to birth statistics provides more information about the birth notification.

The linkage has been applied to data years 2007 to 2019, and over 95% of infant deaths were successfully linked to both data sources for each year. Some death records will not have linked to the birth registration and therefore will not have linked to the birth notification. More information can be found in our User guide to child and infant mortality statistics.

Coding the underlying cause of death

Deaths are cause coded using the World Health Organisation’s (WHO) International Classification of Diseases (ICD). 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.

In England and Wales, stillbirths and neonatal deaths are registered using a special death certificate, which enables reporting of relevant diseases or conditions in both the infant and the mother. The ONS has developed a hierarchical classification system in ICD-10 to produce broad cause groups that enable direct comparison of neonatal and postneonatal deaths. More information on neonatal cause of death certificates can be found in the User guide to child and infant mortality statistics.
## Related links

Bulletin | Released 16 December 2020  
Data for Northern Ireland on stillbirths and infant deaths, based on registrations.

Tables | Released 23 June 2020  
Data for Scotland on stillbirths and infant deaths based on registrations

Dataset | 14 January 2021  
Annual UK and constituent country figures for births, deaths, marriages, divorces, civil partnerships and civil partnership dissolutions.

Bulletin | 22 July 2020  
Live births, stillbirths and the intensity of childbearing, measured by the total fertility rate.

Bulletin | 16 November 2020  
Annual live births in England and Wales by sex, birthweight, gestational age, ethnicity and month, maternities by place of birth and with multiple births, and stillbirths by age of parents and calendar quarter.

Bulletin | 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.

Bulletin | 3 September 2020  
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.