Office for National Statistics

Statistical bulletin

Gestation-specific Infant Mortality: 2012

Death rates of pre-term, full-term and post-term babies and various factors that may influence their survival.

Contact:
Justine Pooley
CIM@ONS.gsi.gov.uk

Release date:
15 October 2014

Next release:
To be announced

Table of contents

1. Main findings

- Babies born in 2012 had an infant mortality rate of 3.9 deaths per 1,000 live births, compared to 4.4 deaths per 1,000 live births for babies born in 2008.
- For babies born at term (between 37 and 41 weeks gestation), the infant mortality rate was 1.4 deaths per 1,000 live births.
- The infant mortality rate for babies born pre-term (between 24 and 36 weeks) in 2012 was 23.6 deaths per 1,000 live births. This was almost 16% lower than the rate for pre-term babies born in 2008 (27.6 deaths per 1,000 live births).
- The infant mortality rate for babies born to mothers aged 40 years and over was 4.8 deaths per 1,000 live births.
- For babies born to mothers aged less than 20 years, the infant mortality rate was 5.7 deaths per 1,000 live births.
- The infant mortality rate for babies born pre-term was higher for single births than for multiple births (24.8 and 19.9 deaths per 1,000 live births respectively).
- Infant mortality rates by ethnic group were highest for babies in the Bangladeshi and Black Caribbean groups (6.9 deaths per 1,000 live births).

2. Summary

This bulletin presents figures on all births and infant deaths in England and Wales in 2012. The figures are based on birth registration information for babies born in England and Wales in 2012, linked to birth notifications data (using the NHS Numbers for Babies, NN4B), and death registrations for babies who died before their first birthday and whose death were registered with the Office for National Statistics (ONS) by the 5 June 2014. This birth cohort allows births and infant deaths to be reported by gestational age and ethnicity.

The infant deaths rates in this bulletin differ slightly from those published in 'Deaths Registered in England and Wales, 2012' (DR) and 'Childhood, Infant and Perinatal Mortality in England and Wales, 2012' (CIPM). The infant mortality rate presented in the DR, 2012 (4.2 deaths per 1,000 live births) was based on deaths that were registered in 2012. The rate in the CIPM, 2012 (4.0 deaths per 1,000 live births) was based on deaths occurring in 2012 that have been linked to their birth registration details. These two rates were based on death cohorts.

3. Users and policy context

There is interest in detailed analysis of infant deaths from policymakers, those responsible for managing services for mothers and babies, charities and academics interested in research into causes of infant death.

Gestational age and ethnicity are not routinely collected at birth registration and have only been routinely reported by ONS since 2006. The findings reported in this bulletin can help in understanding how these important factors relate to births and infant deaths.

ONS is the only source of National Statistics on gestation-specific infant mortality in England and Wales.

The Department of Health's publication 'Healthy lives, healthy people: Improving outcomes and supporting transparency' (DH, 2012) sets out a public health outcomes framework for England for 2013-2016. The domain 'Health improvement' includes the high level indicator 'Low birthweight of term babies' (Indicator 2.1) which is defined as the percentage of all live births at term (37 weeks and over) with low birthweight (under 2,500 grams).

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

Please refer to background note one for definitions of terms used in this release.

4. Background

Substantial inequalities in infant mortality rates are known to exist between White and ethnic minority groups in England and Wales (Gray et al., 2009), and low gestational age is strongly linked to poor health/mortality outcomes (Kurinczuk et al., 2009). However, information about ethnicity and gestational age is not collected at birth registration.

Since the pilot in 2005, the ONS has linked birth registration records with NHS birth notification records. These data are then further linked to death registration records for babies who died before their first birthday.

By linking the three data sources, figures can be reported for infant mortality by gestational age and ethnicity, as well as other risk factors including: birthweight, mother's age at birth of child, marital status and socio-economic status (based on the most advantaged parents' occupation).

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

Individuals may choose not to state their baby's ethnicity. In some areas with a very high proportion of 'Not Stated' records, this 'opting out' may not be the sole reason for incomplete data, as the 'Not Stated' response category also includes 'Not Known', 'Missing' or 'Not Asked'. For babies born in 2012, approximately 3% of live births had ethnicity recorded as 'Not Stated', compared with 4% in 2010 (ONS, 2011).

Low gestational age is a key 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.

For the purposes of this bulletin, if gestational age was below 22 weeks and birthweight was recorded as 1,000 grams or more, the data were considered invalid and were excluded from the analysis. For babies born in 2012, 0.4% of births had no gestational age stated. Over the period 2006 to 2012, these 'gestational age not stated' cases did not show any strong relationship with any other factor at a national level.

5. Data sources and linkage

The Regional Director of Public Health must be notified of a birth within 36 hours by a doctor/midwife. At this point, the NHS Numbers for Babies (NN4B) system for recording birth notifications allocates an NHS number, and the doctor/midwife records key birth details that are not collected at birth registration.

All births in England and Wales must be registered within 42 days of occurrence. As well as details of the birth (date, sex, 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/in a civil partnership, or if the second parent is present at the registration (known as joint registration).

ONS receives 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 is then used by ONS to re-link the records for this birth cohort. A small number of records require ONS to use a probabilistic linkage where this unique identifier is not available. Records linked probabilistically are matched on a number of selected variables.

Registration data on all deaths occurring in England and Wales are held by ONS. Routine linkage of birth records to death registration records identifies those babies who died before their first birthday.

For babies born in 2012, 729,312 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 (536), 0.07% were probabilistically linked.

3,350 stillbirths were also directly linked to their birth notification using sequence number, while 16 (0.5%) records were linked probabilistically.

For infant deaths, 2,825 death registrations (99.6%) were successfully linked to their corresponding birth record.

The reduction in unlinked registrations this year may in part be due to report analysis undertaken at General Register Office (GRO) and improved collaboration between GRO and its stakeholders. Engagement events have enabled the team to share best practice amongst registrars, resulting in a higher percentage of notifications being linked to their registration details.

6. Gestational age

For babies born in 2012, the majority (88%) of live births were delivered full term (between 37 and 41 weeks gestation), 7% were pre-term (between 26 and 36 weeks gestation) and 4% were post-term (over 41 weeks gestation). Of the 7% of births that were pre-term, almost 5% were extremely pre-term (between 24 and 27 weeks), 11% were very pre-term (between 28 and 31 weeks) and 84% were moderately pre-term (between 32 and 36 weeks).

Stillbirths accounted for 0.5% of all births in 2012. Of the 3,544 stillbirths where gestational age was known, 67% were born pre-term. Of these, 38% were extremely pre-term, 24% were very pre-term and 38% were born moderately pre-term.

A fetus is considered viable at 24 weeks. Very few live births occur before this, and infant mortality rates for the few babies born this early are extremely high. For babies born in 2012, 0.1% of live births occurred at less than 24 weeks. The infant mortality rate for these babies was 877.2 deaths per 1,000 live births. The majority of these deaths (93%) occurred during the early neonatal period (the first week of life).

There has been little change in the distribution of birth by gestational age since 2006, when this time series was started. In the publication reporting the 2006 figures, post-term babies were reported in the same category as term babies (37 weeks and over). The report showed that 92% of babies were born after 37 weeks (term and post-term), compared with 93% in 2012.

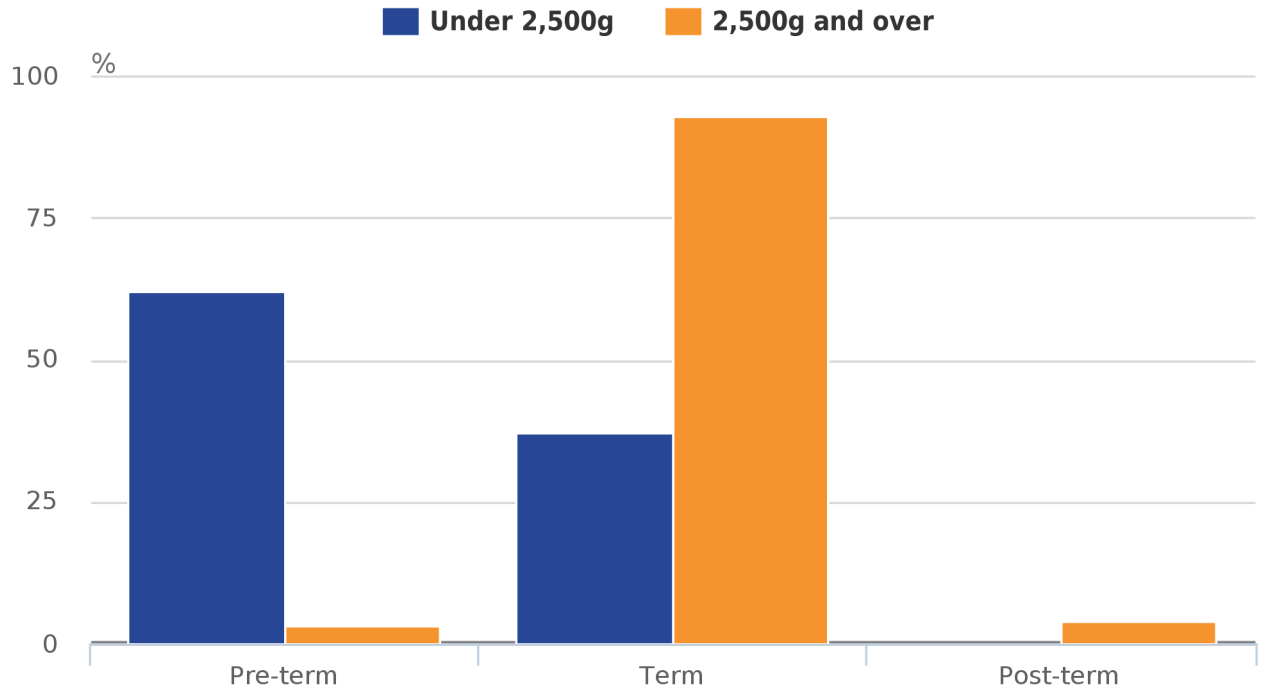
Table 2 (184.5 Kb Excel sheet) shows that the infant mortality rate for babies born pre-term in 2012 was 23.6 deaths per 1,000 live births, 15% lower than the rate for 2008 (27.6 deaths per 1,000 live births). The infant mortality rate for babies born at term (1.4 deaths per 1,000 live births) was significantly lower than the overall infant mortality rate (3.9 deaths per 1,000 live births). Babies born post-term (42 weeks and over) in 2012 comprised 4% of live births, and had an infant mortality rate of 0.9 deaths per 1,000 live births. Recent research has indicated that babies born moderately pre-term (32 to 36 weeks) and early term (37 to 38 weeks) have an increased risk of ill health during childhood (Boyle et al., 2012).

7. Birthweight

Figure 1 illustrates the link between gestational age and birthweight. Babies weighing under 2,500g are considered to have a low birthweight. For babies born in 2012 with low birthweight, 36% were born at term, 61% were pre-term and 0.3% were post-term. In comparison, 93% of babies weighing 2,500 grams and over were born at term, 3% were pre-term and 4% were post-term.

Figure 1: Percentage of live births by grouped birthweight and term, 2012 birth cohort

England and Wales



Source: Office for National Statistics

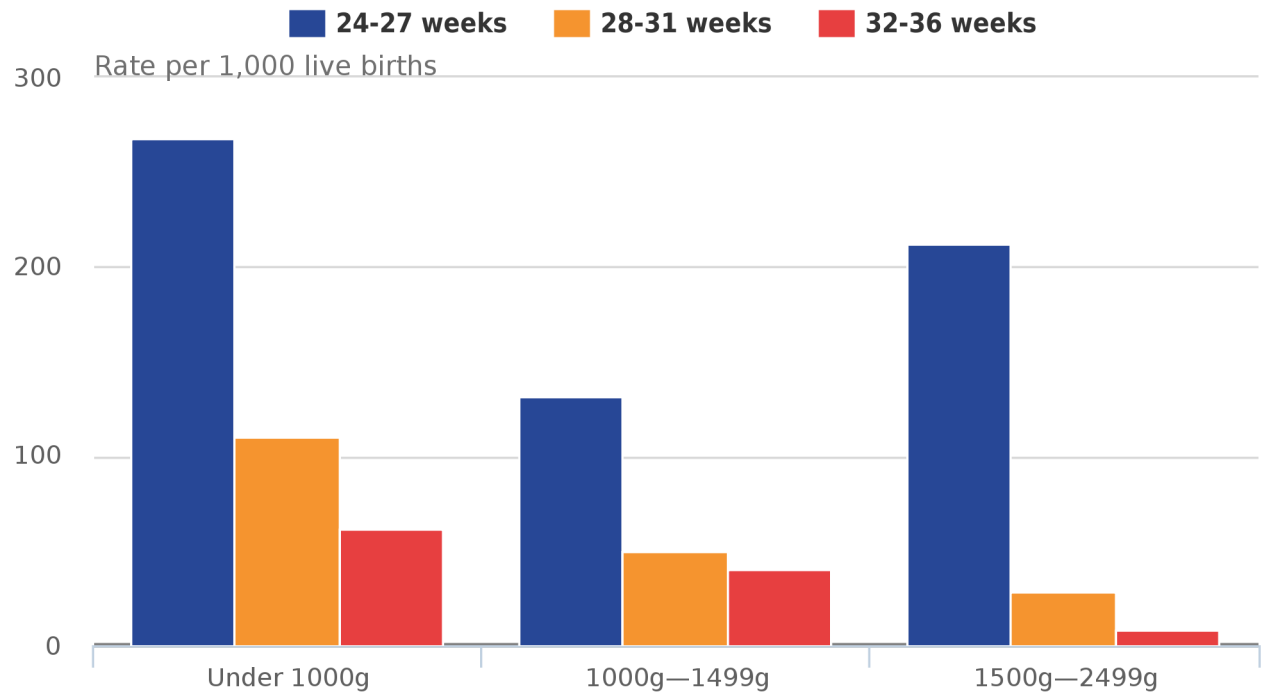
Notes:

1. Pre-term is 24 to 36 completed weeks, term is 37 to 41 completed weeks, post-term is 42 weeks and over.
2. Births occurring at less than 24 weeks gestation account for 0.1% of all live births.
3. Known gestational age only.

The relationship between gestational age and birthweight is reflected in the infant mortality rates of low birthweight babies. Table 3 (184.5 Kb Excel sheet) shows that for babies born in 2012, under 24 weeks gestation and weighing less than 1,000 grams had the highest infant mortality rate (885.1 deaths per 1,000 live births). The lowest rates were for babies born post-term weighing between 2,500 and 3,999 grams (0.6 deaths per 1,000 live births). Figure 2 shows infant mortality rates for babies born pre-term, with a low birthweight. The highest mortality rate was for babies born extremely pre-term weighing less than 1,000 grams (267.9 deaths per 1,000 live births), followed by babies born at the same gestation weighing between 1,500 and 2,499 grams. The lowest rates of infant mortality for these low birthweight babies were for those born moderately pre-term, weighing between 1,500 and 2,499 grams (8.7 deaths per 1,000 live births).

Figure 2: Infant mortality rates for low birthweight babies by gestation, 2012 birth cohort

England and Wales



Source: Office for National Statistics

Notes:

1. Births occurring at less than 24 weeks gestation account for 0.1% of all live births. 88% of these babies born in 2012 died before their first birthday. This represents 23% of all infant deaths.
2. Known gestational age only.
3. Known birthweight only.
4. Infant mortality rates per 1,000 live births.

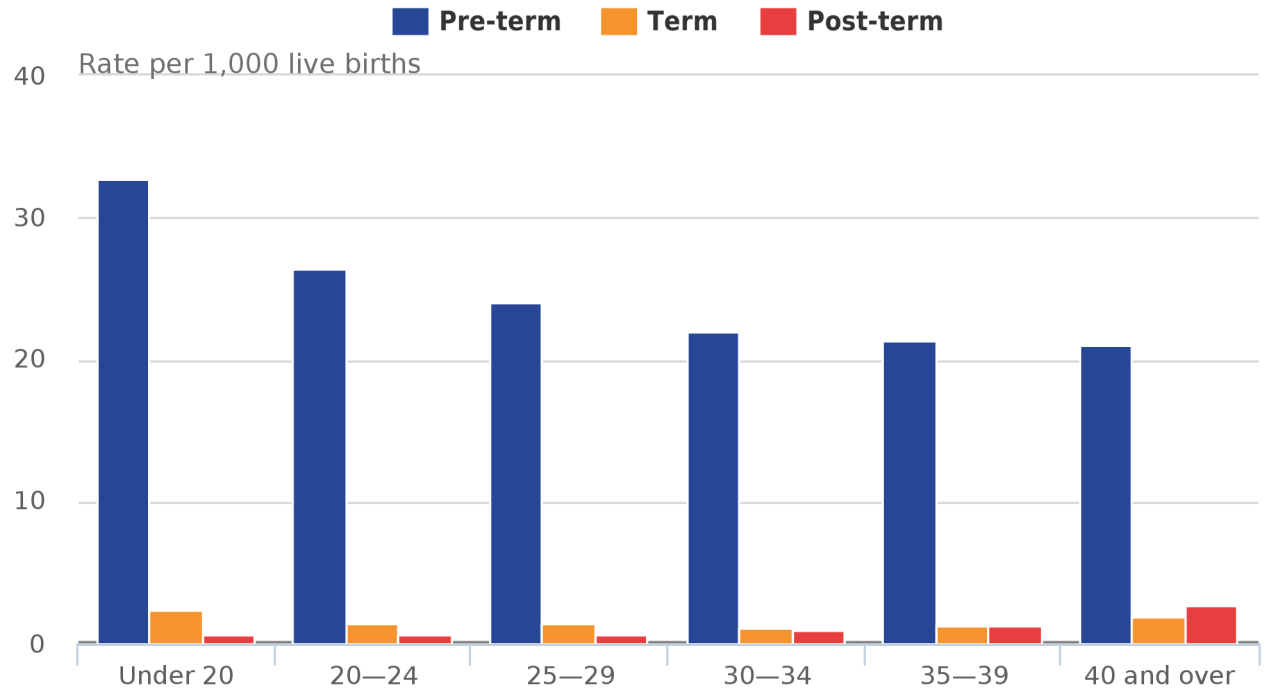
8. Age of mother at birth of baby

Around 7% of all live births take place prematurely, which is under 37 weeks gestation. Mothers aged less than 20 years or over 35 years are more likely to give birth before 37 completed weeks, compared with mothers aged between 20 and 34 years. In 2012, mothers aged 40 years and over had the highest percentage of premature babies at 10%, followed by mothers aged 35 to 39 years and under 20 years at approximately 8%. Around 7% of babies born to mothers aged 20 to 34 years were premature.

Research shows that maternal age typically has a U-shaped relationship with infant mortality, with rates being highest for babies of the youngest and oldest mothers (Misra and Ananth, 2002). Figure 3 illustrates this. For babies born in 2012, where gestational age is known and the baby was born at term, the infant mortality rate was highest for mothers aged less than 20 years (2.3 deaths per 1,000 live births). This was followed by mothers aged 40 years and over, with 1.9 deaths per 1,000 lives births. Babies born at term to mothers aged between 30 and 34 years had the lowest infant mortality rate at 1.1 deaths per 1,000 live births. Babies born post-term to mothers aged 40 and over had the highest infant mortality rate, at 2.7 deaths per 1,000 live births.

Figure 3: Infant mortality rate by term and age of mother at birth, 2012 birth cohort

England and Wales



Source: Office for National Statistics

Notes:

1. Pre-term is 24 to 36 completed weeks, term is 37 to 41 completed weeks, post-term is 42 weeks and over.
2. Known gestational age only.
3. Infant mortality rates per 1,000 live births.

The infant mortality rate for babies born pre-term does not follow this U-shaped pattern. In 2012, the highest infant mortality rate for these babies was for mothers under 20 years of age (32.8 deaths per 1,000 live births). Babies born pre-term to mothers under 20 years of age had significantly higher infant mortality rates compared with mothers aged 20 to 24, 25 to 29 and 40 years and over (26.4, 24.1 and 21.0 deaths per 1,000 live births respectively). Table 1 shows infant mortality rates by age of mother for pre-term babies, 2008 to 2012 birth cohorts.

Table 1: Infant mortality rates by age of mother, babies born pre-term, 2008–2012 birth cohorts

Rate per 1,000 live births

		2012	2011	2010	2009	2008
Under 20	Rate	32.8	28.1	28.1	36.4	41.7
	LCI	26.2	22.2	19.9	30.4	35.3
	UCI	40.5	35.0	31.9	43.6	49.4
20-24	Rate	26.4	33.2	26.3	31.5	33.2
	LCI	23.2	29.6	23.2	28.1	29.6
	UCI	30.0	37.2	29.9	35.4	37.1
25-29	Rate	24.1	21.9	22.8	27.3	27.7
	LCI	21.6	19.5	20.2	24.6	25.0
	UCI	26.9	24.6	25.7	30.2	30.7
30-34	Rate	21.9	24.0	23.7	25.1	24.7
	LCI	19.7	21.5	20.9	22.5	22.2
	UCI	24.4	26.7	26.9	27.9	27.5
35-39	Rate	21.3	23.3	23.2	24.5	21.7
	LCI	18.5	20.3	19.4	21.5	18.9
	UCI	24.6	26.7	27.7	27.9	25.0
40 and over	Rate	21.0	27.6	27.2	26.7	25.0
	LCI	16.1	21.9	16.1	20.7	19.2
	UCI	27.0	34.4	27.5	33.7	32.0

Source: Office for National Statistics

Notes:

1. Known gestational age only.

2. Infant mortality rates per 1,000 live births.

3. The lower and upper 95% confidence intervals (LCI and UCI respectively) have been provided. These form a confidence interval, which is a measure of the statistical precision of an estimate and shows the range of uncertainty around the estimated figure. Calculations based on small numbers of events are often subject to random fluctuations. As a general rule, if the confidence interval around one figure overlaps with the interval around another, we cannot say with certainty that there is more than a chance difference between the two figures.

4. Pre-term is 24 to 36 completed weeks.

Young maternal age may be an indication of other risk factors associated with infant mortality, such as lower socio-economic status (McArnarney, 1987, Finley et al., 2011). However, for very young mothers (under 16 years), research shows that after controlling for other factors such as marital status, education and ethnicity, maternal age remains a risk factor for poor birth outcomes such as pre-term delivery, low birthweight, small for gestational age babies and neonatal mortality (Cooper, Leland and Alexander, 1995).

9. Multiplicity

Single and multiple live births have very different gestational age distributions. For babies born in 2012, only 6% of singleton births were pre-term, compared with more than half (56%) of multiple births. Most women with a twin pregnancy are expected to give birth earlier (at around 36 to 37 weeks gestation) than women with a singleton pregnancy, and there may be an increased risk of stillbirth from 37 weeks for twin pregnancies (Dodd et al., 2012). Table 5 (184.5 Kb Excel sheet) shows that in 2012, singleton babies had an infant mortality rate of 3.4 deaths per 1,000 live births, while multiple babies had an infant mortality rate that was more than five times higher, at 17.3 deaths per 1,000 live births. The neonatal mortality rate for babies born in 2012 was 2.4 deaths per 1,000 live births for singletons and 13.6 deaths per 1,000 live births for multiples.

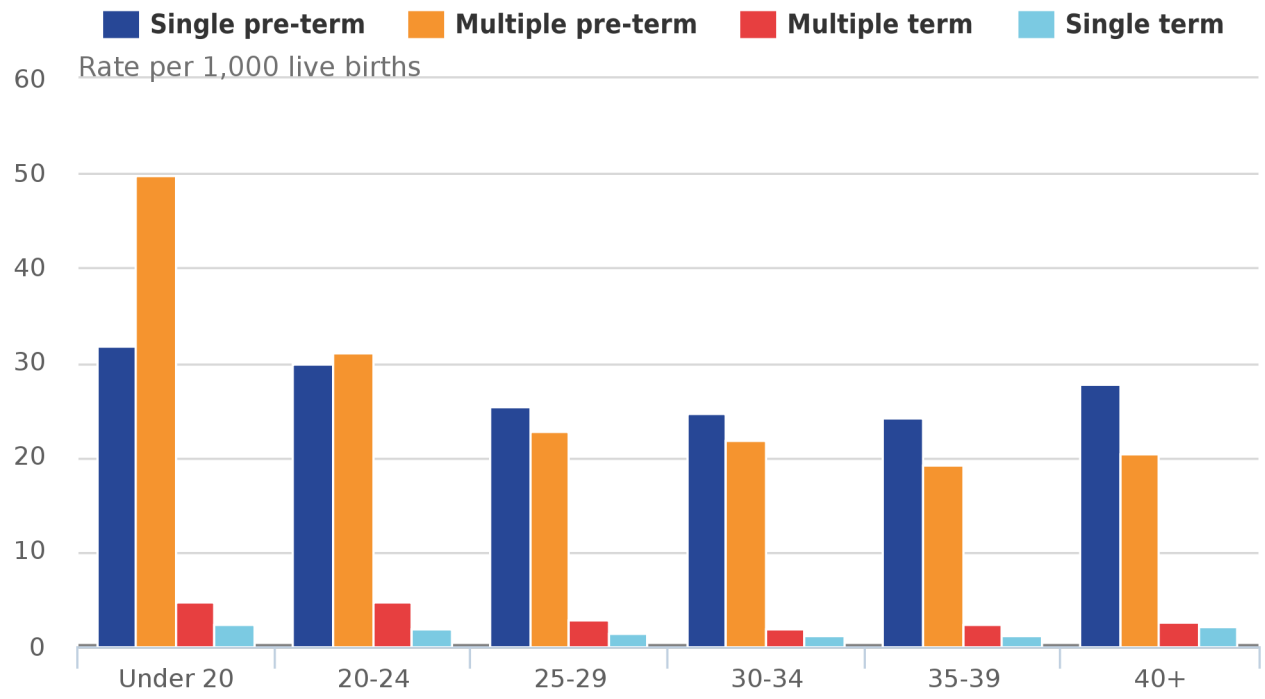
The pre-term infant mortality rate was higher for singletons than for multiple babies at 24.8 compared with 19.9 deaths per 1,000 live births respectively. For pre-term neonatal mortality rates, the figures were 17.3 deaths per 1,000 live births for singletons, compared with 14.8 deaths per 1,000 live births for multiples.

Studies have shown that the typically U-shaped relationship between mother's age and infant mortality observed for singleton births is not observed for multiple births. Mortality rates are higher for multiples born to teen mothers and lower for multiples born to older mothers (Misra and Ananth, 2002; Salihu et al., 2004). The latest figures in this bulletin support this finding.

Figure 4 shows the infant mortality rates for single and multiple birth babies born at term and pre-term by mother's age for the period 2008 to 2012. The chart shows that over this period, infant mortality rates for pre-term babies (singletons and multiples) were highest for mothers less than 20 years of age. Infant mortality rates for multiples born pre-term were lower than the rate for singletons, for mothers aged 25 years and over. For babies born at term, the infant mortality rate for multiples remained higher at all ages.

Figure 4: Infant mortality rates for single and multiple births by age of mother at birth and term, 2008-2012 birth cohorts

England and Wales (1),(2),(3)



Source: Office for National Statistics

Notes:

1. Pre-term is 24 to 36 completed weeks, term is 37 to 41 completed weeks.
2. Known gestational age only.
3. Infant mortality rates per 1,000 live births.

10. Marital status and type of registration

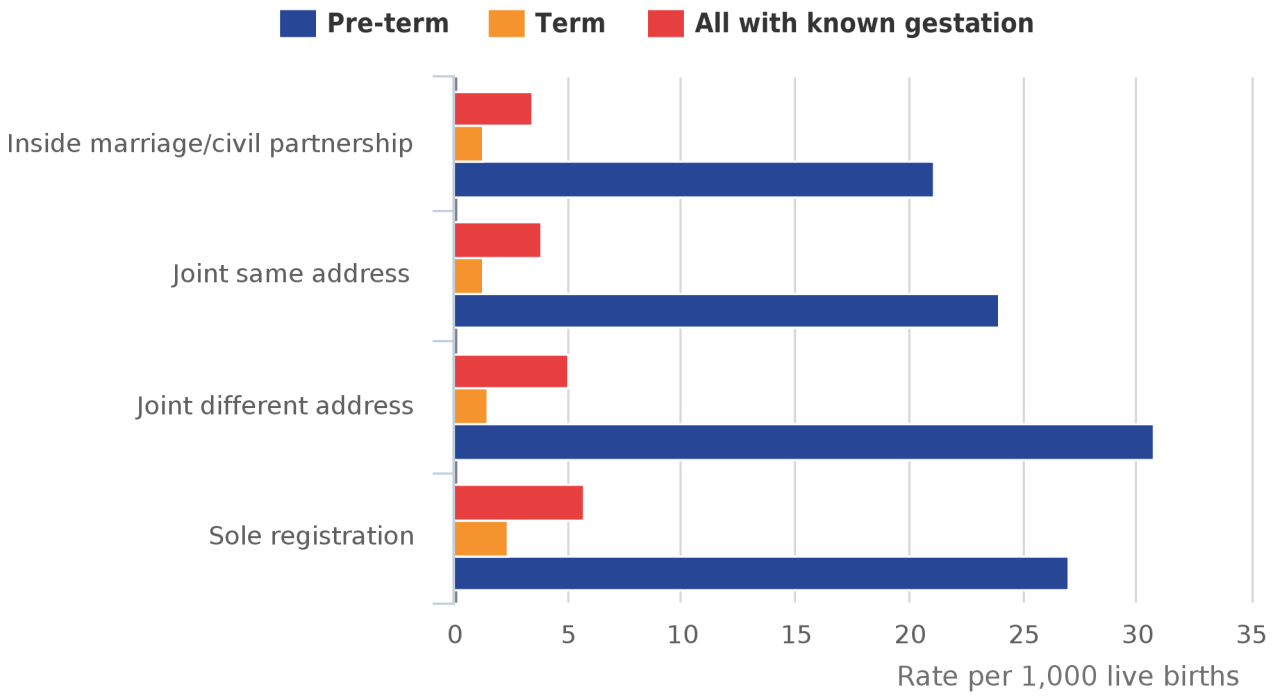
Maternal unmarried status is associated with an increased risk of low birthweight, pre-term birth and small for gestational age (SGA) births (Shah, Zao and Ali, 2011). For babies born in 2012, the percentage of pre-term births was highest for births that were solely registered by the mother (9%), and those registered jointly by parents living at different addresses (8%). In comparison, around 7% of births registered by unmarried parents living at the same address and married parents were born pre-term.

Without information about lifestyle factors such as smoking, income and education level, it is difficult to fully explain the differences in risk of pre-term birth according to marital status. However, some of the differences in pregnancy duration may be caused by the higher prevalence of smoking among unmarried women, or greater stress during pregnancy among women in less stable relationships than married women. However, it is likely that the characteristics of the mother's relationship to a partner are more important than the marital status itself (Luo et al., 2004).

For babies born in 2012, infant mortality rates for all babies with a known gestational age were highest for babies that were sole registered (5.7 deaths per 1,000 live births), followed by babies registered by unmarried parents living at different addresses (5.0 deaths per 1,000 live births). Both of these rates were significantly higher than those for babies registered by unmarried parents living at the same address (3.8 deaths per 1,000 live births), and babies registered by married parents was 3.5 deaths per 1,000 live births. The mortality rates for pre-term babies followed a slightly different pattern, with babies registered to unmarried parents living at different addresses having the highest rate (30.8 deaths per 1,000 live births). This infant mortality rate was significantly higher than those for babies registered by married parents (21.1 deaths per 1,000 live births), and parents living at the same address (24 infant deaths per 1,000 live births). The lowest infant mortality rate for babies born pre-term was for those registered by married parents. This rate of 21.1 deaths per 1,000 live births was significantly lower than those registered jointly by parents living at different addresses.

Figure 5: Infant mortality rates by registration type and term, 2012 birth cohort

England and Wales (1),(2),(3),(4)



Source: Office for National Statistics

Notes:

1. Pre-term is 24 to 36 completed weeks, term is 37 to 41 completed weeks.
2. Births occurring at less than 24 weeks gestation account for 0.1% of all live births. 88% of these babies born in 2012 died before their first birthday. This represents 23% of all infant. deaths.
3. Known gestational age only.
4. Infant mortality rates per 1,000 live births.

11. National statistics socio-economic classification

Details of the second parents' occupation are only recorded where the birth is inside marriage/civil partnership or is jointly registered by both parents outside marriage. Historically, tables showing births and infant mortality by National Statistics Socio-economic Classification (NS-SEC) were produced using only the father's NS-SEC. However, the most advantaged socio-economic position of the parents is likely to have a direct impact on the household, whether it derives from the mother or the second parent (ONS, 2013). Table 7 (184.5 Kb Excel sheet) in this output has been produced using the more advantaged NS-SEC of either parent.

Results are presented by the four main groups of the NS-SEC: Managerial and Professional, Intermediate, Routine and Manual, and Other. Other includes students, those whose occupations were inadequately described or were not classifiable, those who have never worked and the long-term unemployed. NS-SEC is only calculated for 10% of births in England and Wales. Because of the small numbers in the pre-term birth categories, it was possible to calculate mortality rates.

For babies born at term in 2012, the lowest infant mortality rate was for those in the Routine and Manual NS-SEC group (27.4 deaths per 1,000 live births). The lowest rates for babies born pre-term and post-term were for those in the Other and Intermediate groups (41.3 and 0.5 deaths per 1,000 live births respectively).

12. Ethnicity

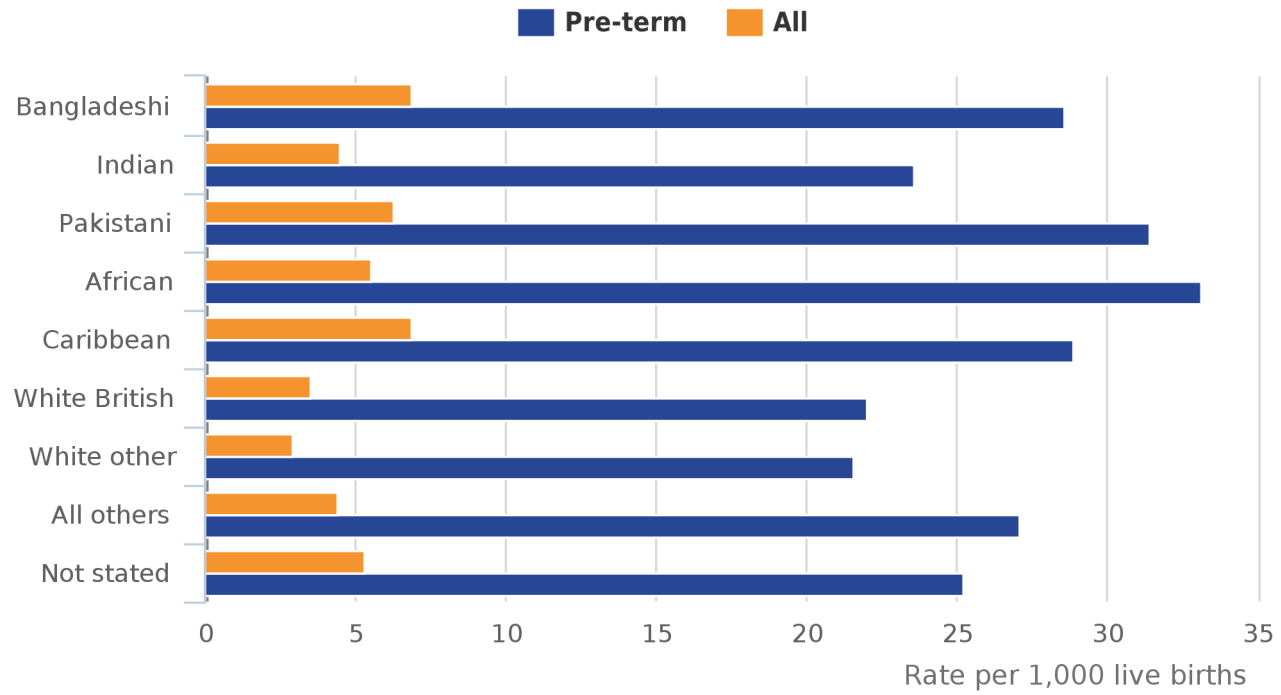
The baby's ethnic group is taken from the birth notifications and is as stated by the mother. For babies born in 2012, the highest percentage of all live births occurred in the White British group (65%), followed by babies from the All Others group at 10%. The lowest percentages for all live births were for babies from the Bangladeshi and Black Caribbean groups (1% of all live births in each group). The highest percentage of births before 37 weeks gestation occurred in the Black Caribbean (10%) and Black African (8%) ethnic groups. The lowest percentages were for the White Other and All Other groups at around 7% for each.

Infant mortality rates for all babies born in 2012 were highest in the Black Caribbean, Bangladeshi (6.9 deaths per 1,000 live births) and Pakistani (6.3 deaths per 1,000 live births) groups. They were lowest in the White Other and White British groups (2.9 and 3.5 deaths per 1,000 live births respectively).

Infant mortality rates for pre-term babies were highest in the Black African and Pakistani groups at 33.1 and 31.4 deaths per 1,000 live births respectively. The lowest mortality rates for pre-term babies were in the White Other (21.6 deaths per 1,000 live births) and White British (22.0 deaths per 1,000 live births) groups. See Figure 6.

Figure 6: Infant mortality rates by ethnic group and term, 2012 birth cohort

England and Wales1,2,3



Source: Office for National Statistics

Notes:

1. Pre-term is 24 to 36 completed weeks.
2. Known gestational age only.
3. Infant mortality rates per 1,000 live births.

There is very little research looking at birth outcomes by babies' ethnicity, although it is likely that there is a strong relationship between the ethnicity of the baby as stated by the mother and the mother's own ethnicity. If this is the case, the ethnicity of the mother may help to explain the differences in gestation and infant mortality between ethnic groups. Some research suggests that Black and Asian women have shorter gestation than White European women, and that this may be due to earlier fetal maturation (Patel et al., 2004). The discrepancies in gestation by ethnicity may also be explained by socio-economic, behavioural and physiological differences among the different ethnic groups (Gray et al., 2009).

13. Cause of death groups: by gestational age and combined ethnic group

Using the broad ONS cause groups, for babies born in 2012, conditions related to immaturity were the most common cause of infant deaths for babies born under 24 weeks (85%) and pre-term babies (53%). This is followed by congenital anomalies at 13% of deaths of babies born under 24 weeks and 28% of deaths of pre-term babies.

Table 9 (184.5 Kb Excel sheet) shows that for babies born at term and post-term, the most common cause of death was congenital anomalies (48% and 58% respectively). The second most common cause group for term babies was difficulties occurring at the time of birth (intrapartum), which includes asphyxia and anoxia (lack of oxygen) or trauma, and accounted for 14% of deaths. For post-term babies, sudden infant death was the cause of around 4% of deaths. Figures for post-term babies are based on small numbers of deaths.

Table 10 (184.5 Kb Excel sheet) shows that for four of the five combined ethnic groups analysed, the most common cause of infant death was immaturity related conditions (Black, 54%; Mixed, Chinese and any other group, 44%; White, 43%; and those where ethnicity was not stated, 49%). For the Asian group, the most common cause was congenital anomalies (41%). A higher incidence of congenital anomalies in Asian populations is well-documented (Gray et al. 2009).

14. Small for gestational age

Low birthweight and prematurity are both measures of fetal development. Another measure is the baby's size in relation to its gestational age. Babies whose birthweight lies below the tenth percentile for their gestational age are known as 'small for gestational age' (SGA).

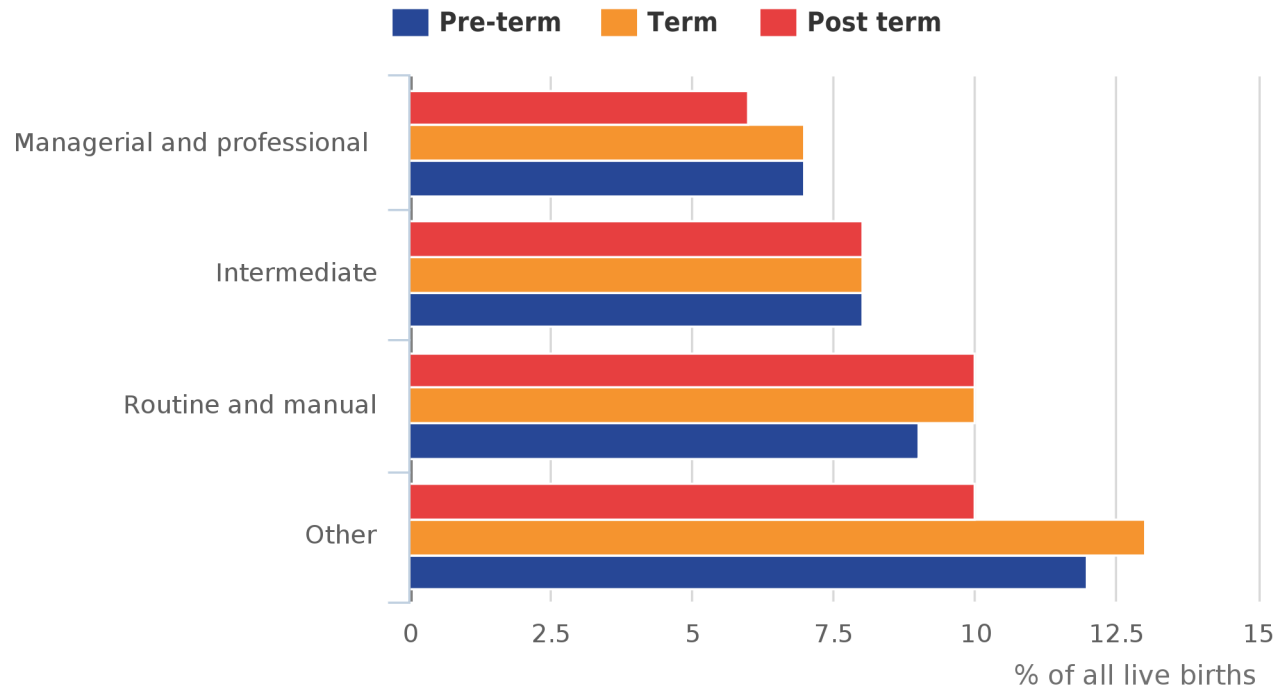
Not all babies who are SGA have a pathological growth restriction; they may just be constitutionally small. This may explain why babies of Bangladeshi, Indian or Pakistani origin are more likely to be SGA than White British babies.

Babies from lower NS-SEC households are more likely to be born SGA. Figure 7 shows that around 12% of pre-term babies, 13% of term babies and 10% of post-term babies born to the least advantaged households are born small for gestational age. These figures fall to approximately 7% for babies born to the most privileged households.

Research shows that pre-term SGA is associated with medical conditions related to pre-eclampsia, but not with socio-demographic status, while term SGA is associated with socio-demographic status and various medical conditions (Ota et al., 2014).

Figure 7: Percentage of babies born small for gestational age (SGA) by term and NS-SEC, 2012 birth cohort

England and Wales



Source: Office for National Statistics

Notes:

1. Pre-term is 24 to 36 completed weeks, term is 37 to 41 completed weeks, post-term is 42 weeks and over.
2. Figures for live births in NS-SEC groups are a 10 per cent sample coded for the most advantaged occupation of either parent.
3. Inside marriage/civil partnership and outside marriage/joint registration only, including cases where second parents occupation was not stated.
4. Students; occupations inadequately described, occupations not classifiable for other reasons; never worked and long-term unemployed.
5. Excludes those with low gestational age inconsistent with birthweight, or gestational age not stated.
6. Known gestational age only.
7. SGA: birthweight below 10th percentile for each gestational age.

A range of environmental and maternal factors also contribute to SGA. In the categories of births analysed, the following groups had the highest proportion of SGA babies: where the birth was solely registered by the mother (12%), mothers aged less than 20 years (11%), and the Bangladeshi ethnic group (17%).These are not necessarily discrete groups.

15. Downloadable tables

Tables to accompany this bulletin can be found on the ONS website (184.5 Kb Excel sheet) . The content of each table can be found below:

Table 1: Birth and death records used in the analysis, 2012 birth cohort, England and Wales

Table 2: Live births, stillbirths and infant deaths by gestational age at birth, 2012 birth cohort, England and Wales

Table 3: Live births, neonatal and infant mortality by birthweight and gestational age at birth, 2012 birth cohort, England and Wales

Table 4: Live births, neonatal and infant mortality by mother's age and gestational age at birth, 2012 birth cohort, England and Wales

Table 5: Live births, neonatal and infant mortality by multiplicity and gestational age at birth, 2012 birth cohort, England and Wales

Table 6: Live births, neonatal and infant mortality by marital status/type of registration and gestational age at birth, 2012 birth cohort, England and Wales

Table 7: Live births, neonatal and infant mortality by NS-SEC (based on most advantaged occupation of either parent) and gestational age at birth, 2012 birth cohort, England and Wales

Table 8: Live births, neonatal and infant mortality by ethnic group and gestational age at birth, 2012 birth cohort, England and Wales

Table 9: Infant deaths by ONS cause groups and gestational age, 2012 birth cohort, England and Wales

Table 10: Infant mortality by ONS cause groups and broad ethnic group, 2012 birth cohort, England and Wales

16. References

Boyle EM (2012) 'Effects of gestational age at birth on health outcomes at 3 and 5 years of age: population based cohort study', BMJ, available at http://www.bmj.com/content/344/bmj.e896

Cooper LG, Leland NL, and Alexander G (1995) 'Effect of maternal age on birth outcomes among young adolescents', Biodemography and Social Biology 42, Issue 1-2, 1995

Department of Health (2012) 'Healthy lives, healthy people: Improving outcomes and supporting transparency'

Dodd JM, Crowther CA, Haslam RR, Robinson JS (2012) 'Elective birth at 37 weeks of gestation versus standard care for women with an uncomplicated twin pregnancy at term: The Twins Timing at Birth Randomised Trial', British Journal of Obstetrics and Gynaecology 119, pp 964-974

Finlay JE, Ozaltin E, Canning D (2011) 'The association of maternal age with infant mortality, child anthropometric failure, diarrhoea and anaemia for first births: evidence from 55 low- and middle-income countries', BMJ Open

Gray R, Headley J, Oakley L, Kurinczuk J J, Brocklehurst P, Hollowell J (2009) 'Inequalities in infant mortality project briefing paper 3. Towards an understanding of variations in infant mortality rates between different ethnic groups', Oxford: National Perinatal Epidemiology Unit

Kurinczuk JJ, Hollowell J, Brocklehurst P and Gray R (2009) 'Inequalities in infant mortality project briefing paper 1. Infant mortality: overview and context', Oxford: National Perinatal Epidemiology Unit

Luo ZC, Wilkins R, Kramer MS (2004) 'Disparities in pregnancy outcomes according to marital and cohabitation status', Obstetrics and Gynecology 103, pp 1300-7

McAnarney ER, (1987) 'Young Maternal Age and adverse neonatal outcome' American Journal of Diseases of Children Oct;141 1053-59

Misra DH, Ananth CV (2002) 'Infant mortality among singletons and twins in the US during two decades: effect of maternal age', Pediatrics 110, pp 1163-8

ONS (2013) 'A combined approach to national statistics socio-economic classification'

ONS (2011) 'Quality of ethnicity and gestation data subnationally for births and infant deaths in England and Wales, 2005-2008'

Ota E et al. (2014) 'Risk Factors and Adverse Perinatal Outcomes among Term and Preterm Infants Born Small-for-Gestational-Age: Secondary Analyses of the WHO Multi-Country Survey on Maternal and Newborn Health', PLoS One 8

Salihu H M, Emusu D, Alivu M H, Kirby R S, Alexander G R (2004) 'Low maternal age and neonatal survival of extremely pre-term twins (20–28 weeks of gestation)', Obstetrics and Gynecology 6, pp 1246-54

Shah PS, Zao J, Ali S (2011) 'Maternal unmarried status and birth outcomes: a systematic review and meta-analysis', Maternal Child Health Journal 7, pp 1097-109

17. Background notes

1. The extract for this bulletin was taken on 5 June 2014. ONS take the extract at this (late) date to ensure we have information on as many deaths occurring within the 2012 birth cohort as possible. There is a small risk that some deaths will not be registered at this time. For the 2011 birth cohort 0.1% of infant deaths were registered after the extract was taken.

2. Definitions used in infant mortality statistics:

   Extremely premature: 24 to 27 weeks gestation

   Very premature: 28 to 31 weeks gestation

   Moderately premature: 32 to 35 weeks

   Premature: less than 37 weeks gestation

   Pre-term: 24 to 36 weeks gestation

   Term: 37 to 41 weeks gestation

   Post-term: 42 weeks or more gestation

   Stillbirth – born after 24 or more weeks completed gestation and which did not, at any time, breathe or show signs of life

   Perinatal: still births plus early neonatal deaths

   Early neonatal: deaths under seven days

   Neonatal: deaths at under 28 days

   Postneonatal: deaths between 28 days and one year

   Infant: deaths under one year

   Rates: neonatal, postneonatal and infant mortality rates are reported per 1,000 live births

3. This report is based on birth registrations data for births occurring in 2012. The electronic birth notification system, termed NHS Numbers for Babies (NN4B) when it was first introduced, comprises a small set of data recorded at the time of birth, including gestational age and ethnicity. Birth registration records are linked to birth notifications records using a unique sequence number where possible, and by probabilistic matching for a small number of cases. Details of earlier linkage can be found in:

   Hilder L, Moser K, Dattani N and MacFarlane A (2007) 'Pilot linkage of NHS Numbers for Babies data with birth registrations', Health Statistics Quarterly 33 (2.95 Mb Pdf), pp 25-33.

4. Reports for Gestation-specific infant mortality for years 2006, 2007/2008, 2009, 2010 and 2011 can be found on the ONS website.

5. Coding of death certificates: The Tenth Revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) has been used to classify all mentions on the death certificate. In England and Wales, neonatal deaths are registered using a special death certificate which enables reporting of relevant diseases or conditions in both the infant and the mother. ONS 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 section 2.11 of Child mortality statistics, 2009 and Annexes K and L.

6. Metadata for births (439.7 Kb Pdf) , mortality (2.7 Mb Pdf) and child mortality statistics (163.2 Kb Pdf) can be found on the ONS website.

7. Special extracts and tabulations of gestation-specific births and infant mortality data for England and Wales are available to order for a charge (subject to legal frameworks, disclosure control, resources and agreements of costs, where appropriate). Such enquiries should be made to:

   Mortality Team Life Events and Population Sources Office for National Statistics Cardiff Road Newport NP10 8XG Tel: +44 (0)1633 455 867 Email: cim@ons.gsi.gov.uk

   The ONS charging policy is available on the ONS website. In line with the ONS approach to open data, ad hoc data requests will be published on the website.

8. Follow ONS on Twitter, Facebook and LinkedIn.

9. We would welcome feedback on the content, format and relevance of this release. Please send feedback to the postal or email address above.

10. Details of the policy governing the release of new data are available by visiting the United Kingdom Statistics Authority or from the Media Relations Office, email: media.relations@ons.gsi.gov.uk

11. A list of the names of those given pre-publication access to the statistics and written commentary is available in Pre-release Access List for Gestation-specific Infant Mortality. The rules and principles which govern pre-release access are featured within the Pre-release Access to Official Statistics Order 2008.

12. Details of the policy governing the release of new data are available by visiting www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html or from the Media Relations Office email: media.relations@ons.gsi.gov.uk

    These National Statistics are produced to high professional standards and released according to the arrangements approved by the UK Statistics Authority.