

Statistical bulletin

# Gestation-specific Infant Mortality in England and Wales: 2010

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



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#### 1. Main figures

- In 2010, the overall infant mortality rate was 4.1 deaths per 1,000 live births.
- For babies born at term, the infant mortality rate was 1.6 deaths per 1,000 live births.
- For pre-term babies, the infant mortality rate was 24.3 deaths per 1,000 live births.
- The infant mortality rate for babies of mothers aged 40 years and over was 5.9 deaths per 1,000 live births.
- For babies of mothers under 20 years, the infant mortality rate was 5.1 deaths per 1,000 live births.
- The pre-term infant mortality rate was higher for singletons than for multiples (25.4 and 20.8 deaths per 1,000 live births respectively).
- Infant mortality rates by ethnic group were highest for babies in the Pakistani group at 8.9 deaths per 1,000 live births.

### 2. Summary

This Bulletin presents figures on births and infant deaths using information from birth registrations in England and Wales in 2010 that has been linked to birth notifications data (NHS Numbers for Babies (NN4B)), then further linked to death registrations data for babies who died before their first birthday. This permits an analysis of births and infant deaths by gestational age and ethnicity.

In 2010, 718,585 live births were successfully linked to their birth notification record, which represents 99.4 per cent of live births from the registration records. For infant deaths, 2,981, or 99.3 per cent, were fully linked to their birth registration and notification records.

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

### 3. Background

Large 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 outcomes (Kurinczuk et al, 2009). However, information about ethnicity and gestational age is not collected routinely at birth registration.

Since 2005, the Office for National Statistics (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 the father's socioeconomic status (based on 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. The 'Not Stated' response category for ethnicity may also include 'Not Known', 'Missing' or 'Not Asked'. In 2010, 4.0 per cent of live births had ethnicity recorded as 'Not Stated', compared with 6.0 per cent in 2009 (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 analysis of gestational age in combination with other variables 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. In 2010 just under 1.0 per cent of births had no gestational age stated. Over the period 2006 to 2010, these 'gestational age not stated' cases did not show any marked correlation with any other variables at a national level.

## 4. Data sources and linkage

The Regional Director of Public Health must be notified of a birth within 36 hours by a doctor or a midwife. At this point, the NHS Numbers for Babies (NN4B) system for recording birth notifications allocates NHS numbers and 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, such as the mother's usual residence and her age at the time of the baby's birth. Information is collected about the father if the parents are married or if the father 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. ONS works closely with the birth notifications service provider to improve data quality and completeness.

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.

In 2010, 718,585 live births were successfully linked to their birth notification records; this represents 99.4 per cent of the registration records of live births. These records were linked using the NHS number. The proportion of linked births reported in this Statistical Bulletin is 0.5 per cent lower than reported in previous years as no probabilistic linking was used for those records without an NHS number.

This year 3,659 stillbirths were also directly linked to their birth notification using NHS number. In previous years all stillbirths were linked probabilistically. Direct linkage using NHS number results in high quality ('correct') linkages. Probabilistic linking uses indirect identifiers such as date of birth, birthweight, mother's date of birth, and postcode, which may result in poorer quality, incorrect linkages.

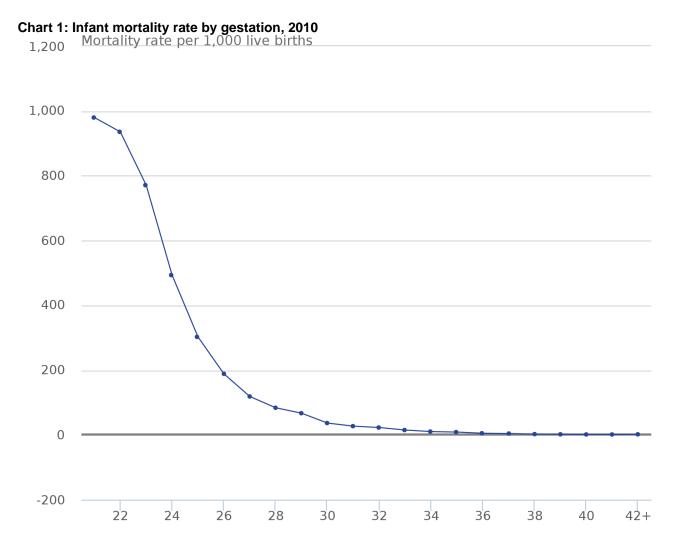
For infant deaths, 2,981 death registrations (99.3 per cent) were successfully linked to their birth registration and notification records.

#### 5. Gestational age

In 2010 the majority (88.6 per cent) of live births were delivered full term (between 37 and 41 weeks gestation). Of the 7.0 per cent of births that were pre-term (between 24 and 36 weeks gestation), 0.3 per cent were extremely pre-term (between 24 and 27 weeks), 0.8 per cent were very pre-term (between 28 and 31 weeks) and 5.9 per cent were moderately pre-term (between 32 and 36 weeks).

A fetus is considered viable at 24 weeks. Very few live births occur before this stage and infant mortality rates for the few babies born this early are extremely high. In 2010, 0.1 per cent of live births occurred at less than 24 weeks; the infant mortality rate for these babies was 877.3 deaths per 1,000 live births. The majority of these deaths (90.3 per cent) occurred during the early neonatal period (the first week of life). See Table 2.

The infant mortality rate for pre-term babies (between 24 and 36 weeks) was 24.3 deaths per 1,000 live births. The infant mortality rate for babies born to term in 2010 (1.6 deaths per 1,000 live births) was lower than the overall infant mortality rate (4.1 deaths per 1,000 live births). Babies born post-term (42 weeks and over) comprised 4.2 per cent of live births and had an infant mortality rate of 1.6 deaths per 1,000 live births. Figure 1 shows how infant mortality rates vary with gestational age.



**Source: Office for National Statistics** 

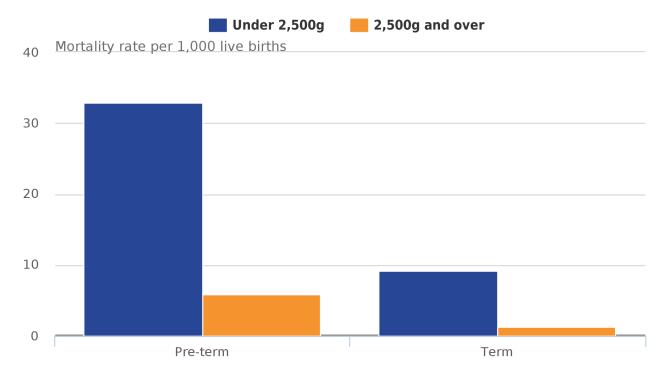
There has been little change in the distribution of birth by gestational age since 2006, when the first Statistical Bulletin in this series was published. In that first Bulletin, post-term babies were reported in the same category as term babies (37 weeks and over); the report showed that 92.4 per cent of babies were born after 37 weeks (term and post-term), compared with 92.9 per cent in 2010.

Of the 7.5 per cent of babies who were born pre-term in 2006, 0.4 per cent were extremely pre-term, 0.9 per cent were very pre-term and 6.2 per cent were moderately pre-term. The infant mortality rate in 2006 for pre-term babies was 28.6 deaths per 1,000 live births, higher than in 2010. The rate for babies born after 37 weeks was 1.9 deaths per 1,000 live births for babies in 2006, compared with 1.6 deaths per 1,000 live births in 2010.

### 6. Birthweight

There is a strong link between gestational age and birthweight. Full-term babies weighing under 2,500g are considered to have a low birthweight. In 2010 37.6 per cent of babies weighing under 2,500 grams were born at term, 60.6 per cent were pre-term and 0.4 per cent were post-term. In comparison, 92.7 per cent of babies weighing 2,500 grams and over were born at term, 2.8 per cent were pre-term and 4.5 per cent were post-term. See Table 3.

Chart 2: Infant mortality rate by grouped birthweight and gestation, 2010



**Source: Office for National Statistics** 

#### Notes:

1. Pre-term - 24 to 26 completed weeks. Term - 37 to 41 completed weeks.

The relationship between gestational age and birthweight is reflected in the infant mortality rates of low birthweight babies. See Table 3. Babies born under 24 weeks and weighing less than 1,000 grams had the highest infant mortality rate (899.0 deaths per 1,000 live births) while the lowest rate was for babies born post-term weighing at least 4,000 grams (0.6 deaths per 1,000 live births). Figure 2 shows the infant mortality rates of term and pre-term babies by weight ranges of under 2,500 grams and 2,500 grams and over.

More than two-thirds of infant deaths (69.2 per cent) occurred during the neonatal period (the first 28 days of life). The highest neonatal mortality rate was for babies born under 24 weeks gestation and weighing less than 1,000 grams (860.0 deaths per 1,000 live births). The lowest neonatal mortality rate was for babies born at term and weighing 4,000 grams and over (0.5 deaths per 1,000 live births).

Even among babies born at term, neonatal mortality rates were higher in lower birthweight babies: 4.3 deaths per 1,000 live births for babies born at term weighing between 1,500 and 2,499 grams, compared with 0.6 deaths per 1,000 live births for babies born at term and weighing in the normal range of 2,500 to 3,999 grams.

#### 7. Age of mother at birth of baby

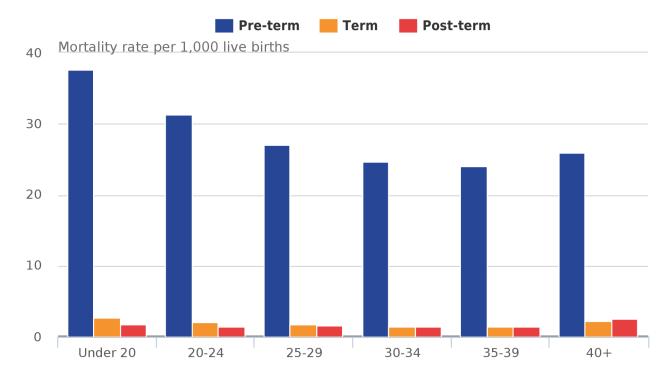
Around 7.0 per cent of all live births are pre-term. Mothers aged under 20 years or over 35 years are more likely to give birth before 37 completed weeks, compared to mothers aged between 20 and 34 years. In 2010, mothers aged 40 years and over had the highest percentage of pre-term babies at 9.9 per cent, followed by mothers aged 35 to 39 years (7.8 per cent), then mothers aged under 20 years (7.2 per cent). Mothers aged 20 to 24 and 25 to 29 years had the lowest proportion of pre-term babies (6.6 per cent) while 7.0 per cent of babies born to mothers aged 30 to 34 years were pre-term. See Table 4.

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). This is confirmed in results presented in this Statistical Bulletin, with mothers aged under 20 or over 40 years having the highest infant mortality rates.

For all babies where gestational age is known, the infant mortality rate in 2010 was highest for mothers aged 40 years and over, at 5.9 deaths per 1,000 live births, followed by mothers aged under 20 years with 5.1 deaths per 1,000 live births. However, for pre-term babies, the infant mortality rate was highest for younger mothers; 28.1 deaths per 1,000 live births for babies born to mothers aged under 20 years, compared to 27.2 deaths per 1,000 live births for those born to mothers aged 40 years and over. Babies born under 24 weeks whose mothers were aged under 20 years had the highest infant mortality rate at 959.2 deaths per 1,000 live births. Babies born at term to mothers aged 35 to 39 years had the lowest infant mortality rate at 1.2 deaths per 1,000 live births. There was a similar pattern for neonatal mortality rates.

Figure 3 shows infant mortality rates for the period 2006 to 2010 by age of mother and grouped gestational age.

Chart 3: Infant mortality rates by age of mother and grouped gestation, 2006-2010



**Source: Office for National Statistics** 

#### Notes:

1. Pre-term is 24 to 36 weeks; term is 37 to 41 weeks and post term is 42 weeks and over.

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).

### 8. Multiplicity

Singleton and multiple live births have very different gestational age distributions (see Table 5). In 2010 only 5.6 per cent of singleton births were pre-term, compared with more than half (52.7 per cent) of multiple births. Most women with a twin pregnancy are known to give birth earlier than women with a singleton pregnancy, at around 36 to 37 weeks gestation, and there may be an increased risk of stillbirth from 37 weeks for twin pregnancies (Dodd et al, 2012). In 2010 singletons had an infant mortality rate of 3.6 deaths per 1,000 live births while multiple babies had an infant mortality rate that was more than five times higher, at 18.8 deaths per 1,000 live births. The neonatal mortality rate in 2010 was 2.5 deaths per 1,000 live births for singletons and 14.2 deaths per 1,000 live births for multiple babies.

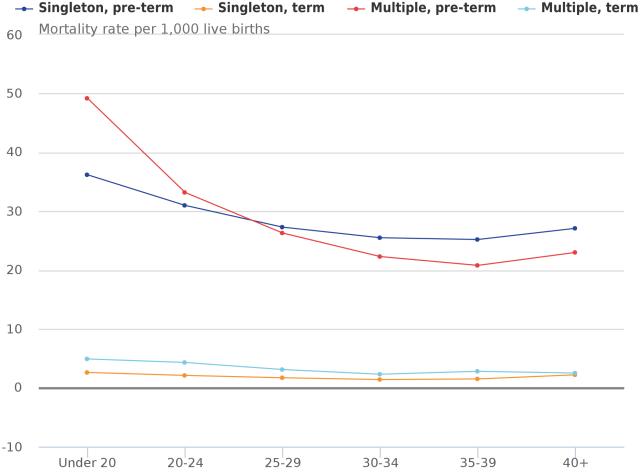
The pre-term infant mortality rate was higher for singletons than for multiple babies at 25.4 compared with 20.8 deaths per 1,000 live births respectively. For neonatal mortality rates, the figures were 18.7 deaths per 1,000 live births for singletons compared with 14.1 deaths per 1,000 live births for multiples.

While there is typically a u-shaped relationship between mother's age and infant mortality (with the highest mortality rates among the youngest and oldest mothers), some research has shown that for multiples, there is an inverse relationship between mother's age and mortality; mortality rates are higher for multiples born to teen mothers and lower for multiples born to older mothers (Misra and Ananth, 2002, Salihu et all, 2004).

Figure 3 shows the infant mortality rates for babies born at term and pre-term by mother's age for the period 2006 to 2010. The chart shows that over this period infant mortality rates for pre-term babies (singletons and multiples) rose for mothers aged 40 years and over. Infant mortality rates for multiples born pre-term fell below 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. However, for multiples the infant mortality rate fell as age increased: from 4.9 deaths per 1,000 live births for mothers aged under 20 years to 2.5 deaths per 1,000 live births for mothers aged 40 years and over. For singletons born at term the infant mortality rate followed the expected u-shaped pattern with rates highest for mothers aged under 20 years and aged 40 years and over (2.6 deaths per 1,000 live births and 2.2 deaths per 1,000 live births respectively).

Chart 4: Singleton and multiple infant mortality rates by age of mother and grouped gestation, 2006-2010



**Source: Office for National Statistics** 

### 9. 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 births (Shah, Zao and Ali, 2011). In 2010 the percentage of pre-term births was highest for births that were solely registered by the mother (8.9 per cent) and those registered jointly by parents living at different addresses (8.0 per cent). In comparison, 7.0 per cent of births registered to unmarried parents living at the same address and 6.7 per cent of births registered to married parents were born pre-term. See Table 6.

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 duration of pregnancy may be because of the higher prevalence of smoking among unmarried women, or greater stress during pregnancy among women in less stable relationships than married women, although 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).

In 2010, infant mortality rates for all babies with a known gestational age were highest for babies registered to both parents who were living at different addresses (5.2 deaths per 1,000 live births), followed by sole registered babies (5.0 deaths per 1,000 live births) and babies registered to unmarried parents living at the same address (4.1 deaths per 1,000 live births).

The infant mortality rate for babies registered to married parents was 3.8 deaths per 1,000 live births. The neonatal mortality rates followed a similar pattern, being highest for babies registered to both parents at different addresses (3.7 deaths per 1,000 live births) and lowest for babies registered to married parents (2.7 deaths per 1,000 live births). The neonatal mortality rate for babies registered to unmarried parents living at the same address was the same as the rate for sole registered babies at 2.8 deaths per 1,000 live births.

Joint registration, same address

Joint registration, different address

Sole registration

0 5 10 15 20 25 30 Mortality rate per 1,000 live births

Chart 5: Infant mortality rates by registration type and grouped gestation, England and Wales, 2010

**Source: Office for National Statistics** 

## 10. Father's occupation

Father's occupational status is coded for a 10 per cent sample of babies born to parents who are married or who register the birth jointly. Results are presented by the four main groups of the National Statistics Socio-economic Classification (NS-SEC): Managerial and Professional, Intermediate, Routine and Manual, and Other, which includes students, those whose occupations were inadequately described or were not classifiable, those who have never worked and the long-term unemployed.

Of these groups, Other had the highest percentage of pre-term births (7.6 per cent) and the highest infant mortality rate at 4.6 deaths per 1,000 live births. The Managerial and Professional group had the lowest proportion of pre-term births (6.5 per cent) and the lowest infant mortality rate at 3.0 deaths per 1,000 live births. See Table 7.

For babies born at term, infant mortality rates were lowest in the Managerial and Professional group at 1.0 deaths per 1,000 live births and highest in the Other group at 2.2 deaths per 1,000 live births. For babies born pre-term, the infant mortality rate in 2010 was highest in the Routine and Manual group at 26.4 deaths per 1,000 live births and lowest in the Managerial and Professional group at 19.8 deaths per 1,000 live births.

## 11. Ethnicity

The baby's ethnic group in birth notifications is as stated by the mother. The highest percentage of pre-term births occurred in the Black Caribbean (9.5 per cent), Black African (7.6 per cent) and Indian (7.5 per cent) ethnic groups. See Table 8.

Infant mortality rates were highest in the Pakistani (8.9 deaths per 1,000 live births), Black Caribbean (8.1 deaths per 1,000 live births) and Black African (6.3 per 1,000 live births) groups. They were lowest in the White Other and White British groups (3.6 and 3.7 deaths per 1,000 live births respectively).

All (with known gestational age) Pre-term Pakistani Caribbean African Bangladeshi Indian White British White Other All others Not stated 20 10 30 40 60 Mortality rate per 1,000 live births

Chart 6: Infant mortality by ethnicity and gestational age, England and Wales, 2010

**Source: Office for National Statistics** 

Infant mortality rates for pre-term babies were also highest in the Pakistani group at 52.3 deaths per 1,000 live births followed by the Black Caribbean group at 36.8 deaths per 1,000 live births and the Black African group at 32.5 deaths per 1,000 live births.

The data here relate to the baby's ethnicity as stated by the mother. There is very little research looking at birth outcomes by baby's 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).

## 12. Cause of death groups: by gestational age and by ethnic group

Using the broad Office for National Statistics (ONS) cause groups, in 2010 conditions related to immaturity were the most common cause of infant deaths for babies born under 24 weeks (86.9 per cent) and pre-term babies (54.0 per cent), followed by congenital anomalies at 9.7 per cent of deaths of babies born under 24 weeks and 27.3 per cent of deaths of pre-term babies.

For babies born at term and post-term the most common cause of death group was congenital anomalies (43.8 per cent and 48.9 per cent respectively). The second most common cause group for term babies was difficulties occurring at the time of birth (intrapartum), which includes asphyxia, anoxia or trauma and accounted for 13.2 per cent of deaths. For post-term babies the second most common cause was sudden infant death (12.8 per cent). Figures for post-term babies are based on small numbers of deaths.

For four of the five broad ethnic groups the most common ONS cause group for infant deaths was immaturity related conditions (Black, 52.3 per cent; Mixed, Chinese and any other group, 45.1 per cent; White, 43.2 per cent; and those where ethnicity was not stated, 39.5 per cent). For the broad Asian group, the most common cause group was congenital anomalies (41.7 per cent). A higher incidence of congenital anomalies in Asian populations is well documented (Gray et al 2009). See Tables 9 and 10.

## 13. Small for gestational age (SGA)

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, see figure 7.

Bangladeshi Indian Pakistani Caribbean African White British White Other All others Not stated ΑII 0 2.5 7.5 10 12.5 15 17.5 20

Chart 7: Percentage small for gestational age (SGA), by ethnicity, England and Wales, 2010

**Source: Office for National Statistics** 

Babies from multiple births are prone to being SGA due to additional demands on the placenta. In 2010 babies from multiple births were more than twice as likely to be SGA as singletons (18.0 per cent compared with 8.3 per cent). However, a range of environmental and maternal factors also contribute to SGA. Within the categories of births analysed, the following groups had the highest proportion of SGA babies: where the birth was solely registered by the mother (12.0 per cent), mothers aged under 20 years (11.4 per cent), the Routine and Manual group (9.3 per cent), and the 'Other' occupational classification (11.2 per cent). These are not necessarily discrete groups.

% small for gestational age

## 14. Users and uses of gestation specific infant mortality statistics

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 Statistical Bulletin can help in understanding how these important factors relate to births and infant deaths.

There is an interest in increasing the number of factors by which infant deaths can be analysed. These figures have potential impact on services for mothers and babies and new research into causes of infant death.

Due to the nature of the NN4B dataset the ONS is the only producer of National Statistics on gestation specific infant mortality in England and Wales. The secondary users of these statistics report the figures provided by ONS. Due to the absence of other information providers it is not possible to compare these statistics with other sources.

Infant mortality statistics for Scotland and Northern Ireland are the responsibility of <u>GRO-Scotland</u> and the <u>Northern Ireland Statistics Research Agency (NISRA)</u> respectively.

## 15. Policy context

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 birth weight 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).

#### 16. Further information

Tables in this report:

- Table 1: Birth and death records used in the analysis, babies born in 2010.
- Table 2: Live births, stillbirths and infant deaths by gestational age at birth, babies born in 2010.
- Table 3: Live births, neonatal and infant mortality by birthweight and gestational age at birth, babies born in 2010.
- Table 4: Live births, neonatal and infant mortality by mother's age and gestational age at birth, babies born in 2010.
- Table 5: Live births, neonatal and infant mortality by multiplicity and gestational age at birth, babies born in 2010.
- Table 6: Live births, neonatal and infant mortality by marital status/type of registration and gestational age at birth, babies born in 2010.
- Table 7: Live births, neonatal and infant mortality by NS-SEC (based on father's occupation) and gestational age at birth, babies born in 2010.
- Table 8: Live births, neonatal and infant mortality by ethnic group and gestational age at birth, babies born in 2010.
- Table 9: Infant deaths by ONS cause groups and gestational age, babies born in 2010.
- Table 10: Infant mortality by ONS cause groups and broad ethnic group, babies born in 2010.

Infant mortality statistics for Scotland and Northern Ireland are the responsibility of <u>GRO-Scotland</u> and the <u>Northern Ireland Statistics Research Agency (NISRA)</u> respectively.

#### 17. References

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

Dodd JM, Crowther CA, Haslam RR, Robinson JS (2012) <u>'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'</u>, British Journal of Obstetrics and Gynaecology, July; 119 (8): 964–974.

Finlay JE, Ozaltin E, Canning D (2011) <u>'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'</u>, BMJ Open.

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

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

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

Salihu H M, Emusu D, Alivu M H, Kirby R S, Alexander G R (2004) <u>'Low maternal age and neonatal survival of extremely pre-term twins (20–28 weeks of gestation)</u> Obstetrics and Gynecology, Jun; 103(6): 1246–54.

Shah PS, Zao J, Ali S (2011) 'Maternal marital status and birth outcomes: a systematic review and meta-analyses'. Maternal Child Health Journal Oct;15(7): 1097-109.

## 18. Background notes

1. 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 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.

- 2. This report is based on birth registrations data for births occurring in 2010. 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 NHS number where possible, and by probabilistic matching on a small number of cases. Details of earlier linkage can be found in Pilot linkage of NHS Numbers for Babies data with birth registrations, Hilder L, Moser K, Dattani N and MacFarlane A, (2007) Health Statistics Quarterly 33 (Spring), 25–33.
- 3. Reports for Gestation-specific infant mortality for years 2006, 2007/2008 and 2009.

#### 4. 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 <a href="Child mortality\_statistics">Child mortality\_statistics</a>, 2009 And Annexes K & L (68 Kb Pdf).

- 5. Metadata for births (439.7 Kb Pdf), mortality (2.7 Mb Pdf) and child mortality (68 Kb Pdf) statistics.
- 6. Special extracts and tabulations of 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
Health and Life Events Division
Office for National Statistics
Cardiff Road
Newport
NP10 8XG

Tel: +44 (0)1633 445 898 Email: cim@ons.gsi.gov.uk

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#### 8. Statistical contact:

Joanne Evans

Tel: +44 (0)1633 455898 Email: cim@ons.gsi.gov.uk Website: www.ons.gov.uk

- 9. National Statistics are produced to high professional standards set out in the Code of Practice for Official Statistics. They undergo regular quality assurance reviews to ensure that they meet customer needs. They are produced free from any political interference.
- 10. Details of the policy governing the release of new data are available by visiting <a href="www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html">www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html</a> or from the Media Relations Office email: <a href="media.relations@ons.gsi.gov.uk">media.relations@ons.gsi.gov.uk</a>