Office for National Statistics

Statistical bulletin

Unexplained deaths in infancy , England and Wales: 2010

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

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1 . Main points

- There were 254 unexplained infant deaths in England and Wales in 2010, which is a rate of 0.35 deaths per 1,000 live births
- Unexplained infant deaths accounted for 8 per cent of all infant deaths in 2010
- Most unexplained infant deaths (85 per cent) occurred in the postneonatal period (between 28 days and one year)
- The rate of unexplained infant deaths for babies born outside of marriage, and registered by the mother only, was 1.18 per 1,000 live births
- The rate of unexplained infant deaths for babies born inside marriage was 0.14 per 1,000 live births

2 . Background

This report on unexplained infant deaths in England and Wales includes both sudden infant deaths and deaths for which the cause remained unascertained after a full investigation.

Sudden infant death, which was first recognised in the early 1960s, is defined as ‘the sudden unexpected death of any infant or young child which is unexpected by history and in which a thorough post-mortem examination fails to demonstrate an adequate cause of death’ (Beckwith, 1970). The term ‘unascertained’ is used by pathologists when the death does not fulfil the criteria used for sudden infant deaths and doubt remains about its cause.

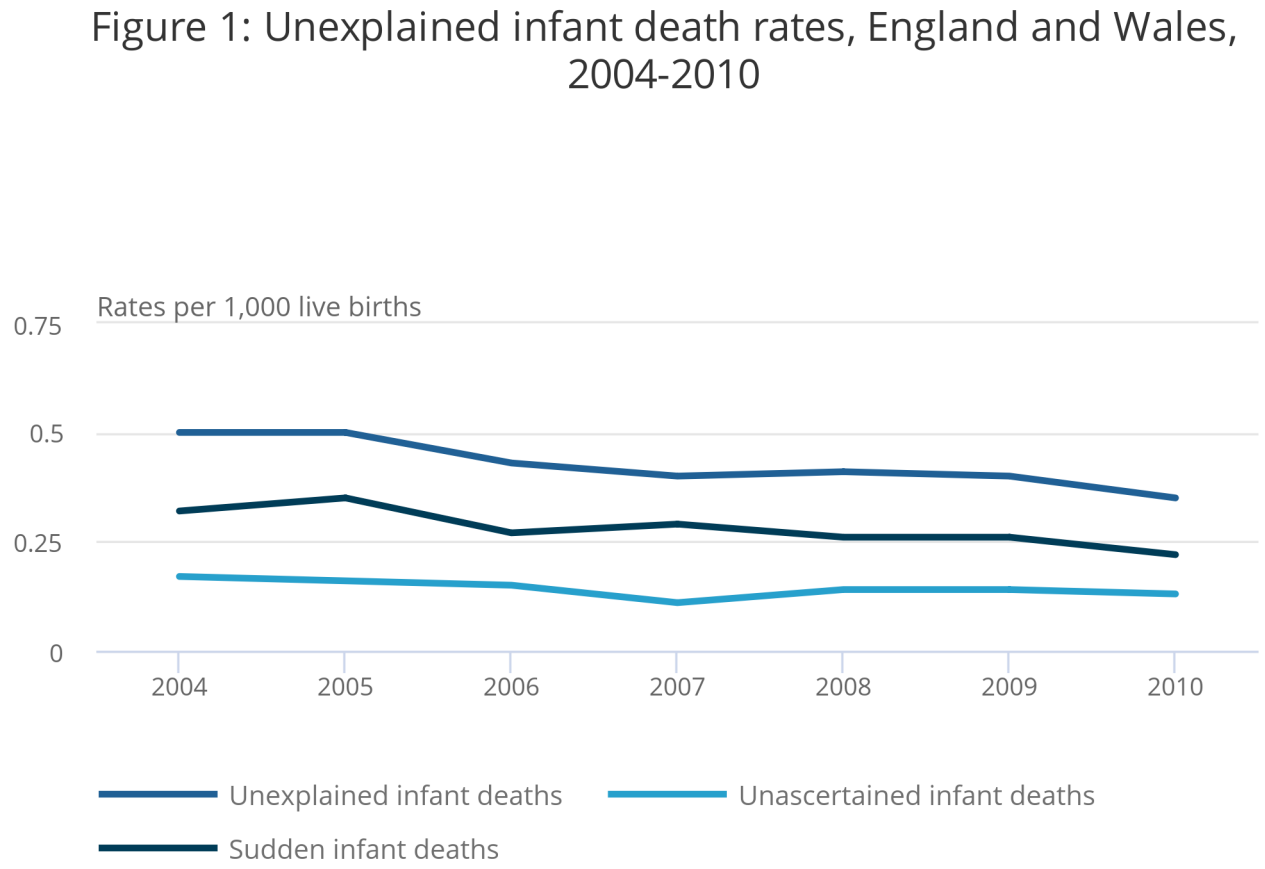
However, there is some evidence to suggest that these terms are used interchangeably by coroners certifying these deaths (Limerick and Bacon, 2004) and research has shown that the characteristics of babies dying of these two causes are very similar (Corbin, 2005). Based on this evidence it is appropriate to include both groups in any analysis of unexplained infant deaths. Figures for 2010 are provisional.

3 . Key risk factors

Risk factors for unexplained infant death include gender, birthweight, maternal age, marital status and socio-economic classification. These factors are considered in this bulletin and reference tables. Other risk factors include sleeping position, unsafe sleep environments including bed-sharing, not breastfeeding, temperature and exposure to tobacco smoke (Ostfeld et al, 2010).

4 . Unexplained infant deaths, 2004-2010

Figure 1: Unexplained infant death rates, England and Wales, 2004-2010



Source: Office for National Statistics

Notes:

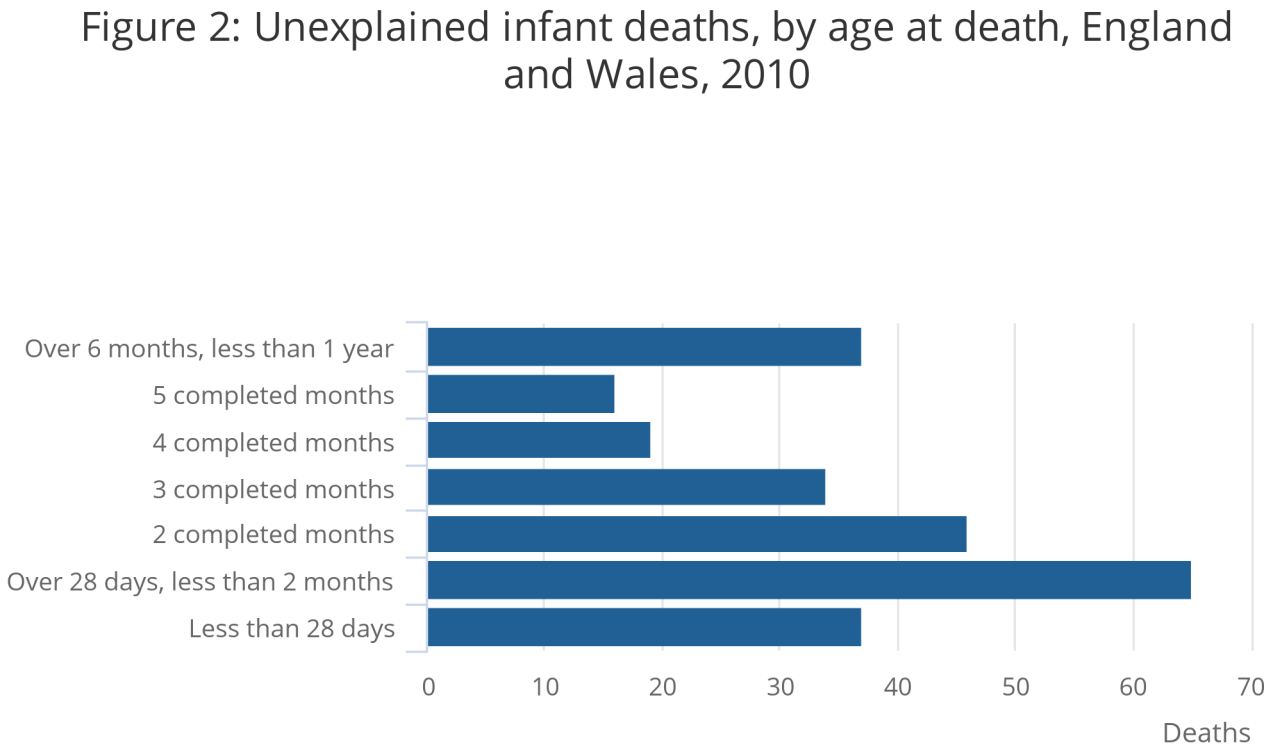
1. Data for 2010 are provisional

In 2010 there were 254 unexplained infant deaths in England and Wales, which is a rate of 0.35 deaths per 1,000 live births. Of the 254 unexplained infant deaths, 158 (62 per cent) were recorded as ‘sudden infant deaths’ and 96 (38 per cent) were recorded as ‘unascertained’. In 2010, unexplained infant deaths accounted for 8 per cent of all infant deaths.

Although the rate of unexplained infant deaths has not changed significantly since 2009 (0.40 deaths per 1,000 live births), the fall from 0.50 deaths per 1,000 live births in 2005 is statistically significant (Figure 1).

5 . Unexplained infant deaths by babies' age and sex

Figure 2: Unexplained infant deaths, by age at death, England and Wales, 2010



Source: Office for National Statistics

Notes:

1. Data for 2010 are provisional

Around 85 per cent of unexplained infant deaths in 2010 occurred in the postneonatal period, which is at least 28 days but less than one year after birth. In comparison, only 31 per cent of all infant deaths in 2010 occurred in the postneonatal period, with the majority (69 per cent) occurring in the neonatal period, that is the first 28 days after birth (Figure 2) (see Child Mortality Statistics: Childhood, Infant and Perinatal, 2010).

The rate of unexplained infant deaths tends to be higher among boys than girls. In 2010 the unexplained infant death rate for boys was 0.40 per 1,000 live births, which accounted for 59 per cent of unexplained infant deaths. In comparison, boys accounted for 51 per cent of all live births in 2010.

The unexplained infant death rate for girls was 0.30 per 1,000 live births (41 per cent of unexplained infant deaths). Research shows that girls are less vulnerable to some perinatal conditions, congenital abnormalities and certain infectious diseases, and that this gives them a biological advantage in terms of survival (United Nations, 2011).

6 . Unexplained infant deaths by month of occurance

In 2010, more than a third of unexplained infant deaths (34 per cent) occurred over the winter period (December to February) while just over a fifth (21 per cent) occurred during the summer (June to August).

Over the period 2004 to 2010 there were 2,024 unexplained infant deaths, 28 per cent of which occurred during winter compared with 21 per cent during summer. December had the highest number of deaths (203 deaths) in the period 2004 to 2010; August had the lowest (126 deaths).

Two risk factors for unexplained infant death are overheating and an unsafe sleeping environment, such as the baby's head being covered. These situations may be more likely to occur during winter, through the use of extra clothing or blankets and central heating at night. The data for unexplained infant deaths by month of occurrence, for the years 2004 to 2010, can be seen in Table 3 (160 Kb Excel sheet) of the tables available for download.

7 . Unexplained infant deaths by region and deprivation

London had the lowest rate of unexplained infant deaths in 2010, at 0.21 deaths per 1,000 live births, followed by the East Midlands at 0.25 deaths per 1,000 live births. The highest rate was in the North West at 0.53 deaths per 1,000 live births, followed by Wales at 0.50 deaths per 1,000 live births. The difference between the rates in London and the North West is statistically significant; the difference between the rates in the East Midlands and Wales is not.

Over the period 2004 to 2010 the East of England had the lowest rate of unexplained infant deaths (0.31 deaths per 1,000 live births), followed by London (0.33 deaths per 1,000 live births). The highest rates over this period were in the North West and Wales at 0.61 and 0.60 deaths per 1,000 live births respectively.

The difference between the higher rates (East of England and London) and the lower rates (North West and Wales) rates is statistically significant. The data for unexplained infant deaths by region, for the years 2004 to 2010, can be seen in Table 4 (160 Kb Excel sheet) of the tables available for download.

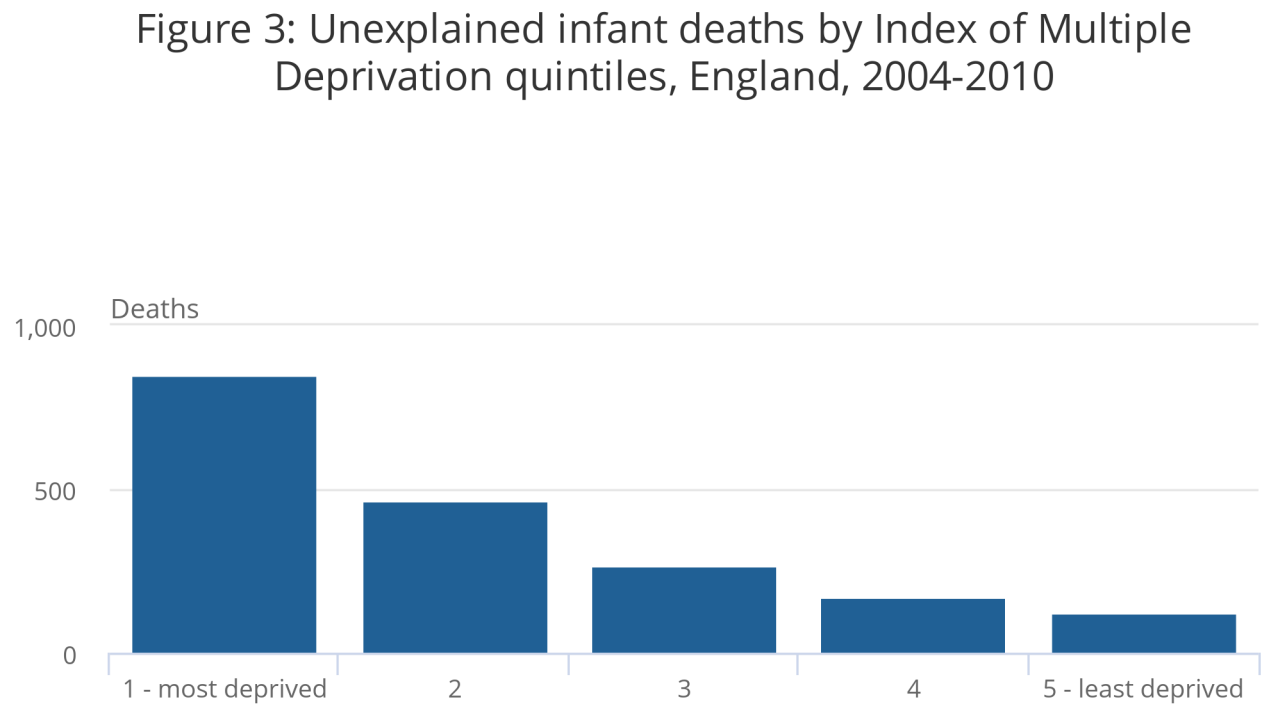
One of the key risks of unexplained infant deaths is maternal smoking during pregnancy, and postnatal exposure to tobacco smoke (Mitchell et al, 1993; MacDorman et al, 1997). The NHS Information Centre publishes data on smoking status at the time of delivery in England. Results from the fourth quarter of 2011/12 show that 13.2 per cent of women in England were recorded as being smokers at the time of delivery.

The North East had the highest proportion of women recorded as being smokers at delivery (20.2 per cent) in 2011/12, followed by the North West (17.0 per cent). London had the lowest proportion at just 6.1 per cent. Reducing smoking during pregnancy – to 11 per cent – is one of three national ambitions laid out in The Tobacco Control Plan (NHS IC, March 2011).

The constituent countries of the UK measure deprivation using their own distinct indices of multiple deprivation (IMD). The IMD for both England and Wales considers the following domains: income, employment, health, education and training, access/barriers to services, living environment/housing, and crime.

However, some of these domains are constructed using different indicators, and they are weighted differently for the two countries. The Welsh IMD also considers the domain ‘physical environment’. Consequently, the charts below show the number of unexplained deaths in infancy separately for England and Wales over the period 2004 to 2010.

Figure 3: Unexplained infant deaths by Index of Multiple Deprivation quintiles, England, 2004-2010

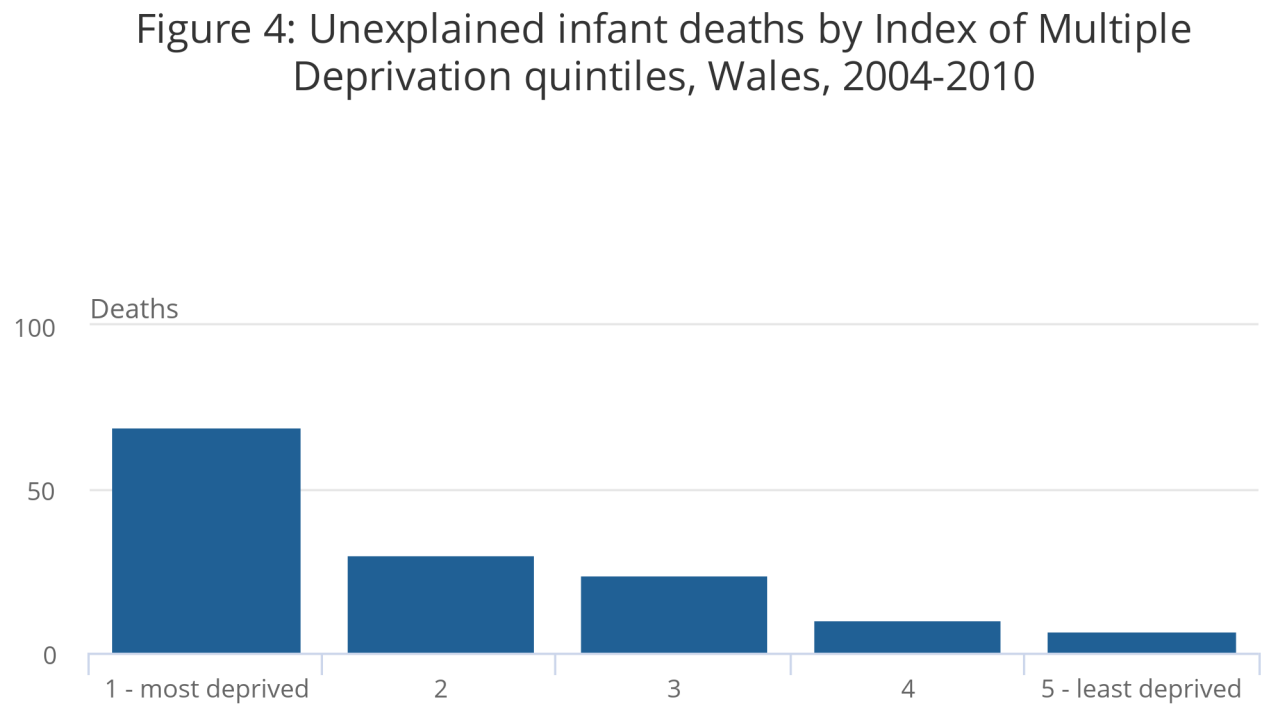


Source: Office for National Statistics

Notes:

1. Data for 2010 are provisional

Figure 4: Unexplained infant deaths by Index of Multiple Deprivation quintiles, Wales, 2004-2010



Source: Office for National Statistics

Notes:

1. Data for 2010 are provisional

Figure 3 shows unexplained infant deaths in England between 2004 and 2010 by Index of Multiple Deprivation quintiles. The most deprived quintile represents deaths in the areas (lower super output areas) that are among the 20 per cent most deprived areas in the country. During the period 2004 to 2010, areas of higher deprivation had considerably higher numbers of unexplained infant deaths.

Figure 4 shows a similar pattern for unexplained infant deaths in Wales during the same period. Babies born into deprived backgrounds are more likely to be born to mothers who smoke and are also more likely to have much greater exposure to second-hand smoke in childhood (NHS IC, 2012).

Research shows that babies whose mothers smoke postnatally have an increased risk of sudden infant death syndrome, compared with babies whose mothers do not smoke, and that the level of risk increases with increasing levels of maternal smoking (Mitchell et al, 1993).

8 . Unexplained infant deaths by characteristics of the mother and birthweight

Table 1: Unexplained infant deaths by characteristics of the mother and birthweight, England and Wales, 2004 - 2010

England & Wales

	Rates per 1,000 live births						
	2004	2005	2006	2007	2008	2009	2010
under 20	1.33	1.32	1.27	1.12	1.07	1.23	1.06
20-24	0.83	0.85	0.72	0.62	0.65	0.58	0.6
25-29	0.4	0.46	0.36	0.37	0.34	0.36	0.31
30-34	0.28	0.28	0.2	0.18	0.23	0.26	0.21
35 and over	0.32	0.27	0.23	0.22	0.25	0.21	0.17

Source: Office for National Statistics

Notes:

1. Data for 2010 are provisional

There is a clear correlation between the age of the mother at the time of giving birth and unexplained infant deaths. In 2010, the unexplained infant death rate was 1.06 deaths per 1,000 live births for mothers aged under 20, falling to 0.31 for mothers aged between 25 and 29 and 0.17 for mothers aged 35 and over. Table 1 shows that this pattern has remained consistent over the last seven years.

Birthweight is a key determinant of infant mortality and is associated with premature birth and factors affecting foetal growth during pregnancy, such as maternal smoking. In 2010, the rate of unexplained infant deaths for low birthweight babies (less than 2,500 grams) was 1.23 deaths per 1,000 live births compared with 0.28 deaths per 1,000 live births for babies with a normal birthweight (2,500 grams and over).

Figures for unexplained infant deaths by birthweight, for the years 2004 to 2010, can be seen in Table 5 (160 Kb Excel sheet) of the tables available to download.

For babies of mothers born in England and Wales, the unexplained infant death rate was 0.41 per 1,000 live births in 2010, compared with 0.18 per 1,000 live births for babies of mothers born outside England and Wales. Figures for unexplained infant deaths by mother's country of birth, for the years 2004 to 2010, can be seen in Table 7 (160 Kb Excel sheet) of the tables available for download.

9 . Unexplained infant deaths by parents' marital status and NS-SEC of the father

Marital status is another key risk factor. In 2010 the unexplained infant death rate for babies born within marriage was 0.14 deaths per 1,000 live births. In comparison, the rate for babies born outside marriage was more than four times higher, at 0.59 deaths per 1,000 live births. This figure doubled for those babies born outside marriage whose birth was registered by the mother only (1.18 deaths per 1,000 live births).

It is thought that differences in death rates by marital status and birth registration reflect complex factors including mother's age and social circumstances (Blair et al 2006). Within marriage, the rate was highest among mothers who had had two or more previous births (0.26 deaths per 1,000 live births). Figures for unexplained infant deaths by mother's marital status, for the years 2004 to 2010, can be seen in Table 8 (160 Kb Excel sheet) of the tables available for download.

Details of father's occupation are only recorded where the birth is inside marriage or is jointly registered by both parents outside marriage. Due to small numbers, the joint registered groups (inside and outside marriage) are reported together, although it is known that the characteristics of these groups vary (Messer 2011). In 2010, the unexplained infant death rate was lowest for those babies whose fathers were in the managerial and professional group at 0.08 deaths per 1,000 live births.

The highest rate of unexplained infant deaths was for those babies whose fathers were in the intermediate group (0.31 deaths per 1,000 live births). The unexplained infant death rate for babies whose fathers were in the routine and manual group was 0.28 deaths per 1,000 live births. This is the first year that this statistical bulletin has reported higher unexplained infant death rates for babies whose fathers were in the intermediate group than for those whose fathers were in the routine and manual group.

However, the year-on-year changes in these rates are not statistically significant and the numbers are very small in most cases. The data for unexplained infant deaths by NS-SEC based on fathers' occupation, for the years 2004 to 2010, can be seen in Table 9 (160 Kb Excel sheet) of the tables available for download.

10 . Methods

The majority of unexplained infant deaths are certified by a coroner either with or without an inquest. This means that there can be considerable delay between death and registration. This report is based on data available up to 29 May 2012 and figures for 2010 are provisional.

Since 2004 ONS has maintained a database of unexplained deaths in infancy. This is created using a late extract from the standard deaths registrations database. The extract is taken late to allow enough time for registration following certification by a coroner.

The deaths in this report occurred between 2004 and 2010 and 98 per cent of all infant deaths in this period have been linked to their corresponding birth records. Of the 2 per cent that remain unlinked, 257 were born outside England and Wales, and 267 were not linked because no record of the birth could be found.

From the linked records, information about parents, which was collected at birth registration, can then be used to enable analysis of the data according to certain risk factors.

11 . Users and uses of unexplained deaths in infancy statistics

There is a great deal of interest in the deaths of apparently healthy babies. Key users of these data include the Foundation for the Study of Infant Deaths (FSID), who are active in raising awareness about sudden infant deaths. Other key users include the Department of Health, Welsh Government and independent researchers, including academics.

The Office for National Statistics (ONS) is the only producer of National Statistics on unexplained deaths in infancy for England and Wales. Infant mortality statistics for Scotland and Northern Ireland are the responsibility of GRO-Scotland and the Northern Ireland Statistics and Research Agency (NISRA) respectively.

Statistics on infant mortality in Scotland are available at: GROS: Statistics.

Statistics on infant mortality in Northern Ireland are available at: Northern Ireland Statistics & Research Agency (NISRA) website.

. Further information

Both the Department of Health and Welsh Government have worked with the Foundation for the Study of Infant Death (FSID) to publish advice and guidance for parents that aims to reduce the risk of cot death. These leaflets are available at:

Department of Health

National Assembly for Wales website

The Foundation for the Study of Infant Deaths (FSID)

. Results available to download

Unexplained deaths in infancy figures for England and Wales, England, Wales, and Regions in England can be found in a Microsoft Excel workbook on the ONS website. The workbook contains the following tables (160 Kb Excel sheet) :

Table 1: Sudden infant deaths, unascertained deaths and all unexplained infant deaths by sex and age at death, England and Wales, 2004–2010

Table 2: Sudden infant deaths, unascertained deaths and all unexplained deaths by age at death, England and Wales, 2004–2010

Table 3: Sudden infant deaths, unascertained deaths and all unexplained infant deaths by month of occurrence, England and Wales, 2004–2010

Table 4: All unexplained infant deaths by Region, England and Wales, 2004–2010

Table 5: Live births and all unexplained infant deaths (numbers and rates) by birthweight, England and Wales, 2004–2010

Table 6: Live births and all unexplained infant deaths by mother's age, England and Wales, 2004–2010

Table 7: Live births and all unexplained infant deaths by mother's country of birth, England and Wales, 2004–2010

Table 8: Live births and all unexplained infant deaths by marital status, parity (within marriage) and type of registration, England and Wales, 2004–2010

Table 9: Live births and unexplained infant deaths by NS-SEC, England and Wales, 2004–2010

. References

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. Background notes

1. The deaths included in this report were those that occurred during 2004 to 2010 and were linked to their corresponding birth records. For this seven-year period, the linkage rate for all infant deaths was 98.0 per cent. The linkage rate has been consistent since records began.

2. From the linked records, information about parents that was collected at birth registration can be used for analysis of the data according to certain risk factors including birthweight, mother's age at birth of child, mother's country of birth, marital status and parity, and father's socio-economic status based on his occupation.

3. The majority of unexplained deaths are certified by a coroner, either with or without an inquest, and therefore there can be some delay between death and registration. This report is based on data available up to 29 May 2012 and figures for 2010 are provisional.

4. Definition of unexplained deaths in infancy:

   Unexplained deaths include both sudden infant deaths and unascertained deaths.

   Sudden infant deaths ICD–10 code R95 Sudden infant death syndrome: include any mention of 'sudden infant death', 'cot death', 'SIDS', 'crib death', or another similar term anywhere on the death certificate.

   Unascertained deaths ICD–10 code R99 other ill-defined and unspecified causes of mortality: include cases where the only mention on the death certificate is unascertained death.

5. Infant deaths are divided into neonatal (less than 28 days after live birth) and postneonatal (between 28 days and one year).

6. Mortality rates are presented as deaths per 1,000 live births.

7. Data for 2010 are provisional and will be finalised in next year's Unexplained Deaths in Infancy in England and Wales statistical bulletin.

8. Earlier reports for unexplained deaths in infancy for 2003 to 2007 were published annually in the autumn edition of Health Statistics Quarterly.

9. The Unexplained deaths in infancy 2009 statistical bulletin which includes data for 2008 and 2009.

10. A Quality and Methodological Information Report for this release.

11. Special extracts and tabulations of unexplained deaths in infancy data for England and Wales are available to order for a charge (subject to legal frameworks, disclosure control, resources and agreement of costs, where appropriate). For such requests enquiries should be made to:

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    Office for National Statistics Government Buildings Cardiff Road Newport Gwent NP10 8XG

    Tel: +44 (0)1633 456021 E-mail: CIM@ons.gov.uk

    The ONS charging policy is available on the ONS website.

12. As a valued user of our statistics, we would welcome feedback on this release. In particular, the content, format and structure. This is in line with the Health and Life Events user engagement strategy. Please send feedback to the postal or e-mail address above.

13. Follow ONS on Twitter and Facebook .

14. 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.

15. 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.gov.uk