

# **Scottish Perinatal and Infant Mortality and Morbidity Report**

**2009**







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## **2009**

Information Services Division  
NHSScotland

NHS Quality Improvement Scotland (NHS QIS)  
Reproductive Health Programme

Edinburgh 2011



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يمكن أن يتوفر هذا الإعلان بلغات مختلفة، وطباعة بحجم أكبر، وطباعة برايل (باللغة الإنجليزية فقط). للحصول على معلومات حول ترجمة هذا الإعلان بلغتك المحلية، يرجى الاتصال بالرقم الوارد أدناه.

यह प्रकाशन विभिन्न भाषाओं, बड़े अक्षरों, ब्रेल लिपि (सिर्फ अंग्रेजी) में उपलब्ध कराया जा सकता है। आपके समुदाय की भाषा में इसे प्रकाशन के अनुवाद के बारे में जानकारी के लिए कृपया नीचे दिए हुए नम्बर पर टेलीफोन करें।

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یہ طبع مختلف زبانوں اور بڑے چھاپ میں دستیاب کی جاسکتی ہے، برائلی (صرف انگریزی میں)۔ اپنی کمیونٹی کے زبان میراس طبع کے ترجمے کے بارے میں معلومات حاصل کرنے کے لئے، براہ کرم مندرجہ ذیل نمبر پر فون کیجئے۔

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## SUMMARY

The key national numbers and rates of events are summarised here with brief comments where appropriate.

### 1. Total births and deaths in 2009:

- Total births: 59,363; this is 1,003 fewer than in 2008, reversing the steady rise since 2002.
- 688 deaths were notified to Survey
  - 136 late fetal deaths
  - 317 stillbirths
  - 165 neonatal deaths
  - 70 post-neonatal deaths

### 2. Stillbirths:

- Stillbirth rate: 5.3 per 1000 total births.
- FIGO 'preventable' stillbirth rate: 3.2 per 1000.

### 3. Neonatal deaths:

- Total neonatal death rate: 2.8 per 1000 live births, equalling the lowest ever recorded.
- Early neonatal mortality rate: 2.0 per 1000 live births.
- Perinatal mortality rate: 7.4 per 1000 total births, equalling the lowest ever recorded.
- FIGO 'preventable' neonatal mortality rate: 0.9 per 1000 live births.

### 4. Other mortality rates:

- Post-neonatal mortality rate: 1.2 per 1000 live births, the lowest ever recorded.
- Infant mortality rate: 4.0 per 1000 live births, the lowest ever recorded.

### 5. Singleton births:

- Stillbirth rate: 5.1 per 1000 total singleton births:
  - 64% 'unexplained' obstetric cause
  - 14% antepartum haemorrhage
  - 13% congenital anomaly
- Neonatal death rate: 2.3 per 1000 singleton live births:
  - 41% 'unexplained' obstetric cause
  - 32% congenital anomaly

### 6. Multiple births:

- The rate of twins is 15.8 per 1000 births, a little below 2008's record rate of 16.0 per 1000.
- Stillbirth rate: 12.7 per 1000 total multiple births.
- Neonatal death rate: 17.1 per 1000 multiple live births.



## **7. Other findings:**

- Postmortem rate for stillbirths rose to 59% from 55% in 2008.
- The placenta is examined histologically in only 77% of stillbirths.
- Histological placental dysfunction and intrauterine growth restriction occurred in 59% and 29% respectively of 'unexplained' stillbirths.
- Low birth weight and prematurity continue to be associated with the highest rates of stillbirth and neonatal mortality.
- There is no significant variation in mortality rates between NHS boards.

## **8. Congenital anomalies:**

- Most anomalies are of the heart and circulatory system.
- Antenatal screening reduces the rates at birth of neural tube defects and Down's Syndrome.

## **9. Conclusions and recommendations**

This report includes information on the work to improve the range and quality of the data collected by the survey and to modernise the classification system for the causes of stillbirths and neonatal deaths.

Recommendations for further work are included for the first time.



## RECOMMENDATIONS

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1. The Scottish Perinatal and Infant Mortality and Morbidity Report (SPIMMR) should continue to be produced annually to provide regular information on the outcome of births in Scotland.
2. At intervals to be defined (every five years), a more detailed overview should be produced, to examine trends over a longer time scale.
3. The placenta should be examined histologically in all cases of stillbirth and in as many cases of neonatal death as is possible.
4. The benefits of a postmortem examination carried out by a perinatal pathologist should be explained to all parents.
5. Current work to increase the range of information collected about each death, particularly including enhanced demographic information, should continue.
6. The revision and modernisation of the classification system for the causes of stillbirths and neonatal deaths should continue.
7. Communication and engagement between the NHS QIS Reproductive Health Programme and individual maternity and neonatal units should continue with the aim of improving the quality and completeness of data obtained about each death. Individual named co-ordinators are essential to this process.
8. Discussions should take place with the clinical community to ascertain how the information in the annual report should be presented so that it is educationally and clinically most useful.
9. Each report should include recommendations. An assessment of the implementation and impact of previous recommendations should also be included.
10. Work to establish a congenital anomaly audit for Scotland should continue.



# 1 Introduction and Methods

---

Annual reports on perinatal mortality in Scotland have been produced since 1977. The report now also includes information on late fetal deaths (losses from 20 weeks gestation), late neonatal and post-neonatal infant deaths. The deaths are classified according to both the obstetric event leading to the death and the clinico-pathological events in the fetus or baby. In recent years, information on certain congenital anomalies occurring in livebirths, stillbirths, miscarriages and terminations has also been included.

The conduct of the Scottish Stillbirth and Infant Death Survey (SSBIDS) and the production of the report has been dependent on NHS organisational arrangements which change from time to time. The process is now managed jointly by the Reproductive Health Programme of NHS Quality Improvement Scotland (NHS QIS) and the Information Services Division (ISD) of NHS National Services Scotland with collaboration from the General Registry Office Scotland (GROS). Detailed information for each death is obtained from designated co-ordinators in each maternity unit and associated neonatal unit. The co-ordinators are listed in Appendix 10.3; the survey could not continue without their help and cooperation. Causes of death are classified by the NHS QIS clinical advisor based on all the information received. More detail on the methodology involved is in appendix 10.8 and further relevant information is given in appropriate sections of the report.

The equivalent data for England, Wales and Northern Ireland are collected by the Centre for Maternal and Child Enquiries (CMACE) and reported annually. Where appropriate, comparisons are made within this report with the most recently published CMACE report for 2008<sup>1</sup>.

The presentation of this report is different from recent years. The main body describes the findings and includes key tables and figures. Most of the detailed tables are provided in appendices. The report also includes, for the first time, recommendations as to the future conduct of the survey and presentation of the report.



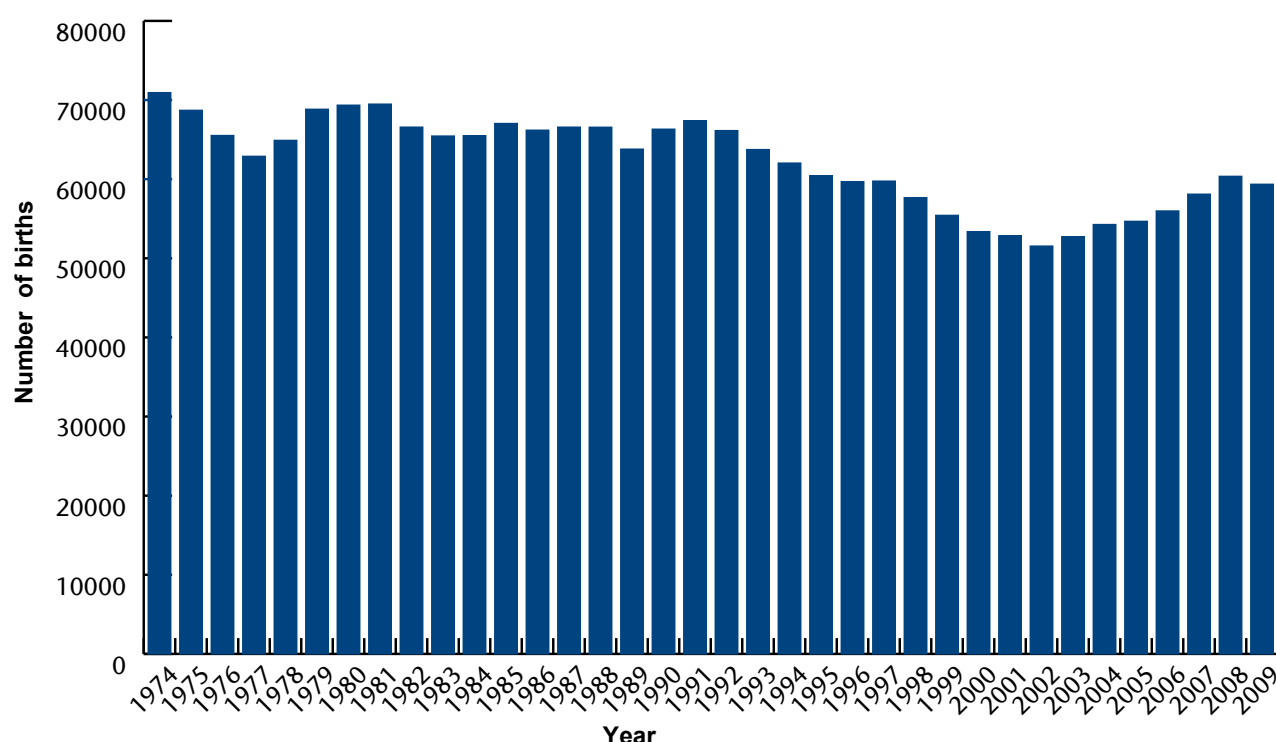
## 2 Trends Over Time

### 2.1 Total Births

There were 59,363 live and still births in Scotland in 2009. This is a fall of 1,003 births from the 2008 total of 60,366 (1.7%) and is the first reverse in the upward trend since 2002, when there were 51,548 births, the lowest number recorded since accurate birth registration. The trend in total births over the last 35 years is illustrated in Figure 1.

Births in England and Wales have followed a similar pattern, with a steady rise since 2001. Total live births in 2009 (706,248) were 0.3% lower than in 2008 (708,711)<sup>2</sup>.

**Figure 1 Total births in Scotland: 1974-2009**



Source: GROS

### 2.2 Stillbirths and Infant Deaths

Numbers and rates of stillbirths and of perinatal, neonatal and infant deaths for the last five years are summarised in Table 1. Rates for all categories of death in 2009 are broadly similar to those in previous recent years. The infant mortality rate (3.98 per 1000 live births) is the lowest ever recorded in Scotland and the stillbirth (5.34 per 1000 births), early neonatal (2.03 per 1000 live births) and perinatal mortality (7.36 per 1000 births) rates all equal the lowest recorded rates in Scotland. Figure 2 summarises rates of stillbirth, neonatal death and post-neonatal death over the last 35 years. Although there has been a fall in all three categories of death over this period, most of the improvement occurred in the first 10-15 years. Slight declines in neonatal and post-neonatal deaths have continued but there has been no significant change in the stillbirth rate in the last two decades. This effect has been distorted by the reduction in the defined gestational age of stillbirth from 28 to 24 weeks in 1992. Nonetheless, examining only those years since the amended definition shows little change. These findings have been analysed and discussed further in a recent review of trends in perinatal mortality in Scotland over 30 years<sup>3</sup>.



In 2008, the overall UK stillbirth rate (including Scotland) was 5.1 per 1000 births (Scotland's rate was 5.4 in 2008), the perinatal mortality rate 7.5 per 1000 live births (Scotland 7.4) and the neonatal mortality rate 3.2 per 1000 live births (Scotland 2.8)<sup>1</sup>.

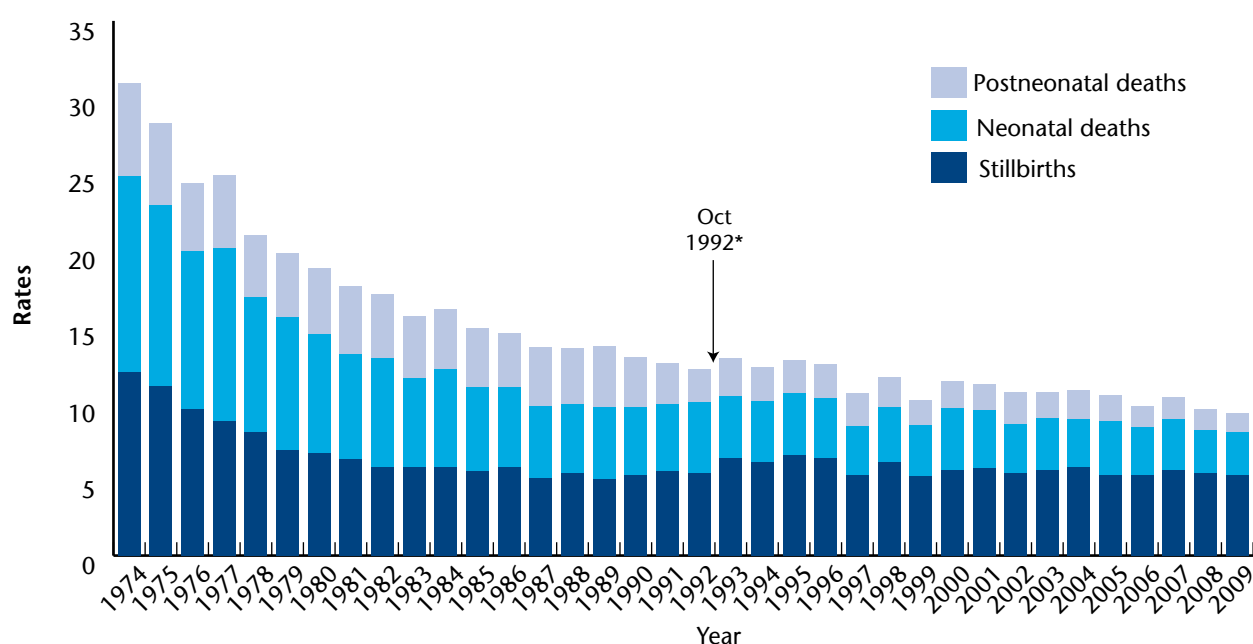
**Table 1 Stillbirths and deaths in the first year of life: 2003-2009**

	2003	2004	2005	2006	2007	2008	2009	
<b>Numbers</b>								
Live births	52432	53957	54386	55690	57781	60041	59046	
Stillbirths	296	317	292	296	327	325	317	
Early neonatal deaths	128	122	131	119	129	122	120	
Perinatal deaths	424	439	423	415	456	447	437	
Late neonatal deaths	50	44	59	53	59	46	45	
Neonatal deaths	178	166	190	172	188	168	165	
Post neonatal deaths	87	100	94	76	84	85	70	
Infant deaths	265	266	284	248	272	253	235	
<b>Rates</b>								95% CI
Stillbirth <sup>1</sup>	5.6	5.8	5.3	5.3	5.6	5.4	5.3	4.77,5.96
Early neonatal <sup>2</sup>	2.4	2.3	2.4	2.1	2.2	2.0	2.0	1.68,2.43
Perinatal <sup>1</sup>	8.0	8.1	7.7	7.4	7.8	7.4	7.4	6.69,8.09
Late neonatal <sup>2</sup>	1.0	0.8	1.1	1.0	1.0	0.8	0.8	0.56,1.02
Neonatal <sup>2</sup>	3.4	3.1	3.5	3.1	3.3	2.8	2.8	2.38,3.26
Post-neonatal <sup>2</sup>	1.7	1.9	1.7	1.4	1.5	1.4	1.2	0.92,1.50
Infant <sup>2</sup>	5.1	4.9	5.2	4.5	4.7	4.2	4.0	3.49,4.52

1 Rate per 1000 total births.

2 Rate per 1000 live births.

Source: GROS

**Figure 2 Stillbirths<sup>1</sup>, neonatal<sup>2</sup> and post-neonatal<sup>2</sup> mortality rates: 1974-2009**


1 Rate per 1000 total births.

2 Rate per 1000 live births.

\* The definition of a stillbirth was changed from 28 weeks to 24 weeks on 1 October 1992.

Source: GROS



For the purpose of international comparison and to evaluate the effectiveness of care, the International Federation of Obstetrics and Gynaecology (FIGO) advocates the presentation of perinatal mortality data among infants weighing 1000g or more (roughly equivalent to 28 weeks gestation) and without major congenital anomaly<sup>4</sup>. The rates in Scotland over the last 10 years are presented in Appendix 10.1 Table A5. Using the FIGO criteria, the stillbirth rate in 2009 was 3.2 per 1000 births, the neonatal mortality rate 0.9 per 1000 live births and the perinatal mortality rate 3.9 per 1000 births. These are similar to recent years but show an encouraging downward trend.

The equivalent information for England, Wales and Northern Ireland was not published for 2008 because of uncertainties about the accuracy of the data. Appendix 10.1 Table A5 also includes data excluding infants weighing less than 500g for comparison with previous CMACE reports.

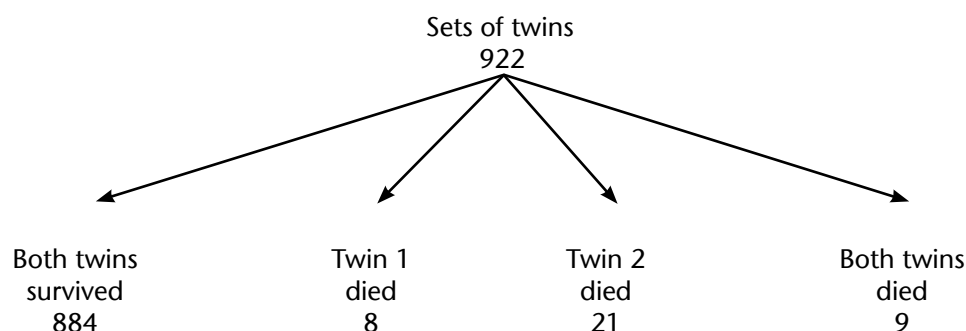
### 2.3 Single and Multiple Births

In 2009, there were 57,473 singleton births, 922 sets of twins, 14 sets of triplets and one set of quadruplets registered with GROS. The rate of twins was, at 15.8 per 1000 maternities (95% CI, 14.8-16.8), a little lower than the previous year's record of 16.0 per 1000. Single and multiple births each year since 2003 are shown in Appendix 10.1 Table A6.

Comparison of the stillbirth and neonatal mortality rates since 2003 are shown in Appendix 10.1 Table A7. In 2009, the stillbirth rate was 5.1 per 1000 singleton births and 12.7 per 1000 multiple births; neonatal mortality rates were 2.3 per 1000 singleton births and 17.1 per 1000 multiple live births. Although these rates are similar to recent years, there appears to be a definite trend towards improvement in the rates of both stillbirths and neonatal deaths among multiple pregnancies which is not apparent in singletons. The effect is, however, somewhat distorted by the unusually high rate of losses among multiple pregnancies in 2003. The rates in 2002 (not shown in Appendix 10.1 Table A7) were lower. In addition, the relatively low numbers of multiple pregnancies result in greater fluctuations year on year. This improvement in the outcome of multiple pregnancies in the past decade has been noted in the CMACE report for the UK as a whole<sup>1</sup> where the change in the rates of stillbirths and of neonatal deaths among multiple pregnancies was reported as statistically significant.

The outcomes for twin pregnancies with a registered stillbirth or neonatal death are shown in Figure 3.

**Figure 3 Outcome for twins: 2009**





## 3 Causes of Stillbirths and Neonatal Deaths

---

### 3.1 Cause of Death in Singleton and Multiple Births

Each stillbirth or neonatal death is classified twice; for obstetric factors leading to the death and for pathology in the infant. This double classification uses the Scottish Obstetric and Paediatric system last modified in 1987<sup>5,6</sup>. The number of deaths assigned to all 28 obstetric and all 30 paediatric categories are shown in Appendix 10.1 Table A8 and Table A9 and this information is summarised in Tables 2 and 3 which show the broad categories of causes of death among singleton births and, for stillbirths, differentiates between those occurring before labour (antepartum (AP)) and during labour (intrapartum (IP)). The classification of causes is also summarised graphically in Figure 4a. The same information for multiple pregnancies is provided in Appendix 10.1 Tables A10 and A11 and graphically in Figure 4b.

As in previous years, the limitations of the classification system are apparent. Among singleton births, 63.8% of stillbirths and 40.6% of neonatal deaths were placed in the 'unexplained' obstetric category. Although this category was only applied to 29.2% of multiple stillbirths, 84.4% of multiple neonatal deaths were obstetrically 'unexplained'.

Under the conventions of this hierarchical system, congenital anomaly always takes precedence over other causes and accounted for 94 out of the 482 stillbirths and neonatal deaths (19.5%). Antepartum haemorrhage, particularly placental abruption, was the most frequent directly obstetric cause, 64 deaths (13.3%) being so attributed. There have been no deaths due to isoimmunisation for many years and the persistence of this category as a separate classification is an anachronism.

Neonatal deaths related to prematurity are common particularly among multiple births. In 2009, this was the main cause of death (as identified by 'lung immaturity' or 'hyaline membrane disease') in 18.0% of singleton neonatal deaths and 65.6% of neonatal deaths to multiple pregnancies (Appendix 10.1 Table A11).

A further difficulty with the classification system lies in the lack of definition as to what constitutes an intrapartum stillbirth or intrapartum anoxia leading to a neonatal death. The recent report which presented trends in Scottish perinatal mortality over 30 years<sup>3</sup> suggested a possible small rise in intrapartum stillbirths in recent years, but emphasised the difficulties of accurate definition and recognition. The number of stillbirths defined as 'intrapartum' in 2009 was the same (19) as in 2008. In 2009, 11 of these were 'unexplained', compared to nine in 2008.



**Table 2 Singleton stillbirths and neonatal deaths by obstetric classification: 2009**

Obstetric Classification	AP Stillbirth Numbers	IP Stillbirth	END	LND	Stillbirth <sup>1</sup> Rates	Neonatal mortality <sup>2</sup>
<b>Total</b>	<b>274</b>	<b>19</b>	<b>98</b>	<b>35</b>	<b>5.1</b>	<b>2.3</b>
Congenital anomaly	36	3	29	14	0.7	0.8
Isoimmunisation	-	-	-	-	-	-
Hypertension of pregnancy	9	-	3	3	0.2	0.1
Antepartum haemorrhage	36	4	18	4	0.7	0.4
Trauma/mechanical	3	1	3	-	0.1	0.1
Maternal disorder	14	-	-	1	0.2	0.0
Miscellaneous	-	-	-	1	-	0.0
Unexplained <2500g	108	2	24	8	1.9	0.6
Unexplained ≥2500g	68	9	19	3	1.3	0.4
Postnatal cause only	-	-	2	1	-	0.1

1 Rate per 1000 singleton total births.

2 Rate per 1000 singleton live births.

Source: Survey

**Table 3 Singleton stillbirths and neonatal deaths by paediatric classification: 2009**

Paediatric Classification	AP Stillbirth Numbers	IP Stillbirth	END	LND	Stillbirth <sup>1</sup> Rates	Neonatal mortality <sup>2</sup>
<b>Total</b>	<b>274</b>	<b>19</b>	<b>98</b>	<b>35</b>	<b>5.1</b>	<b>2.3</b>
Congenital anomaly	36	3	29	14	0.7	0.8
Isoimmunisation	-	-	-	-	-	-
Anoxia/birth trauma	232	14	36	5	4.3	0.7
Lung immaturity	-	-	18	4	-	0.4
Hyaline membrane disease	-	-	1	1	-	0.0
Intracranial haemorrhage	-	-	2	1	-	0.1
Infection	6	2	3	7	0.1	0.2
Other haemorrhage	-	-	1	-	-	0.0
Other paediatric factors	-	-	5	1	-	0.1
Unexplained	-	-	3	2	-	0.1

1 Rate per 1000 singleton total births.

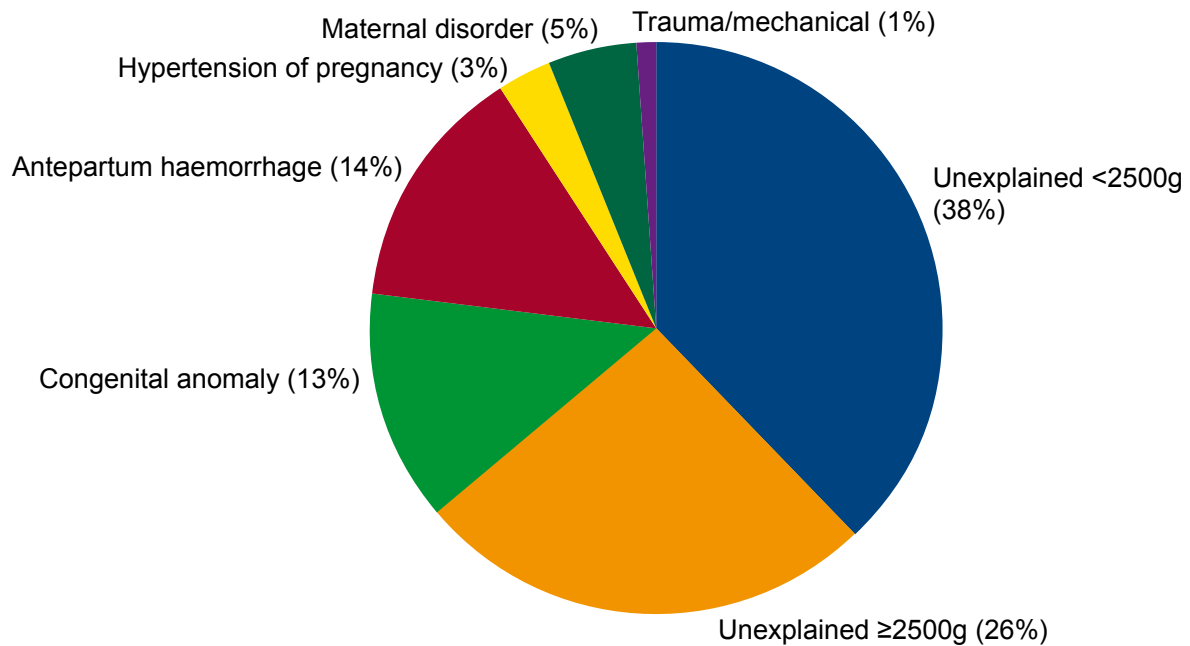
2 Rate per 1000 singleton live births.

Source: Survey

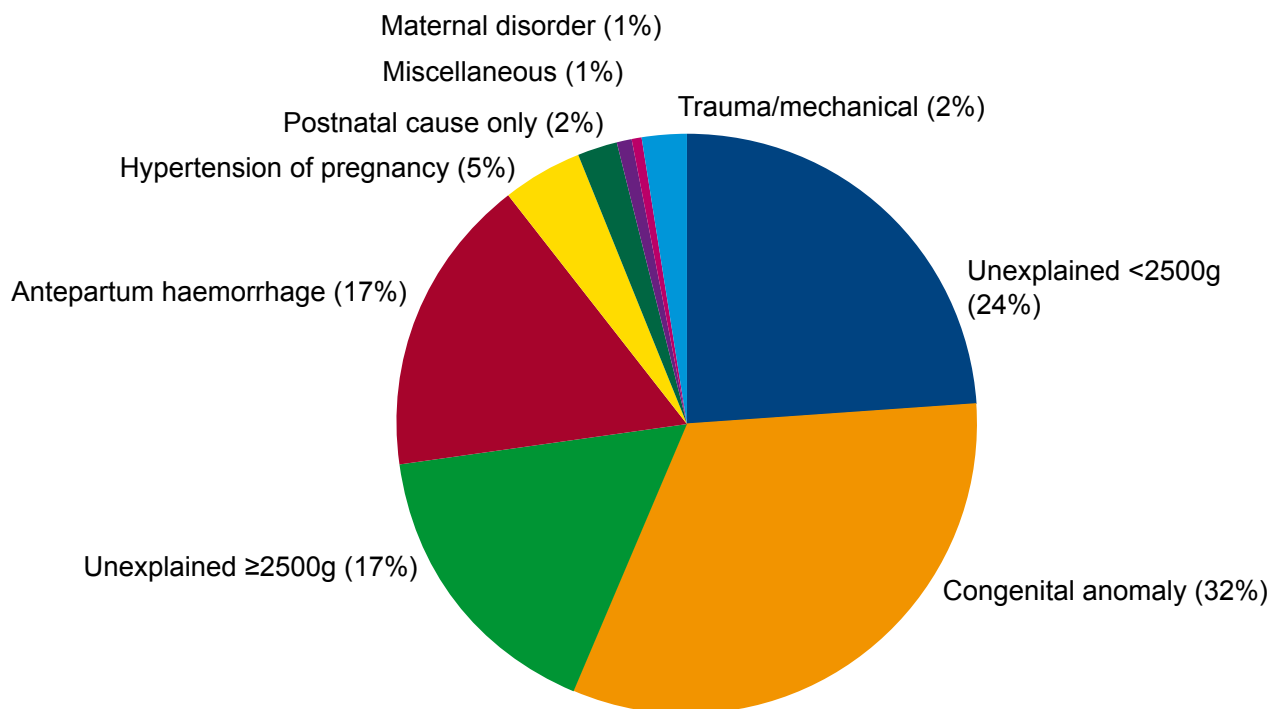


**Figures 4a Percentage distribution of cause of death; singleton births: 2009**

**Singleton stillbirths by obstetric classification**

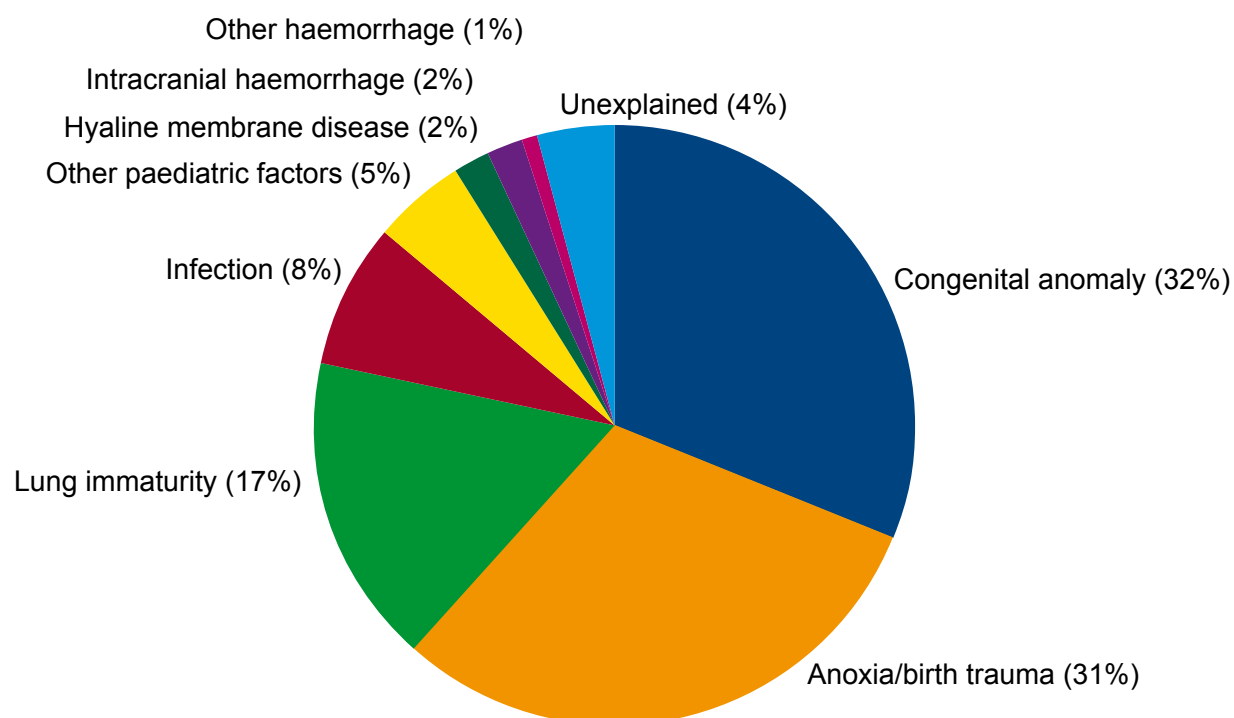


**Singleton neonatal deaths by obstetric classification**





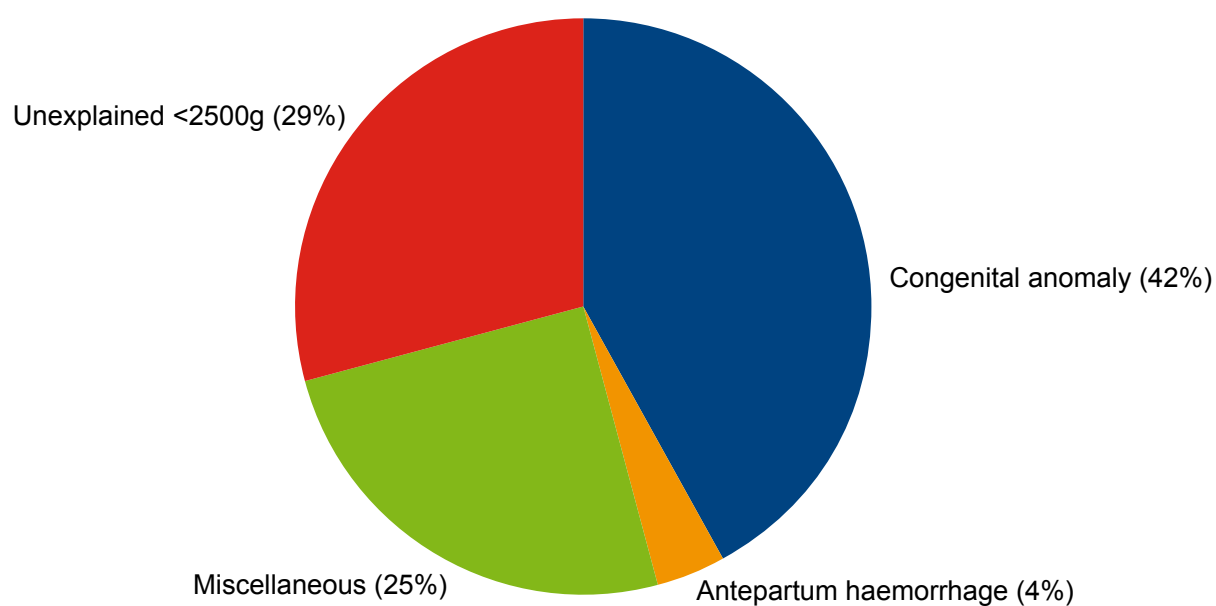
## Singleton neonatal deaths by paediatric classification



Source: Survey

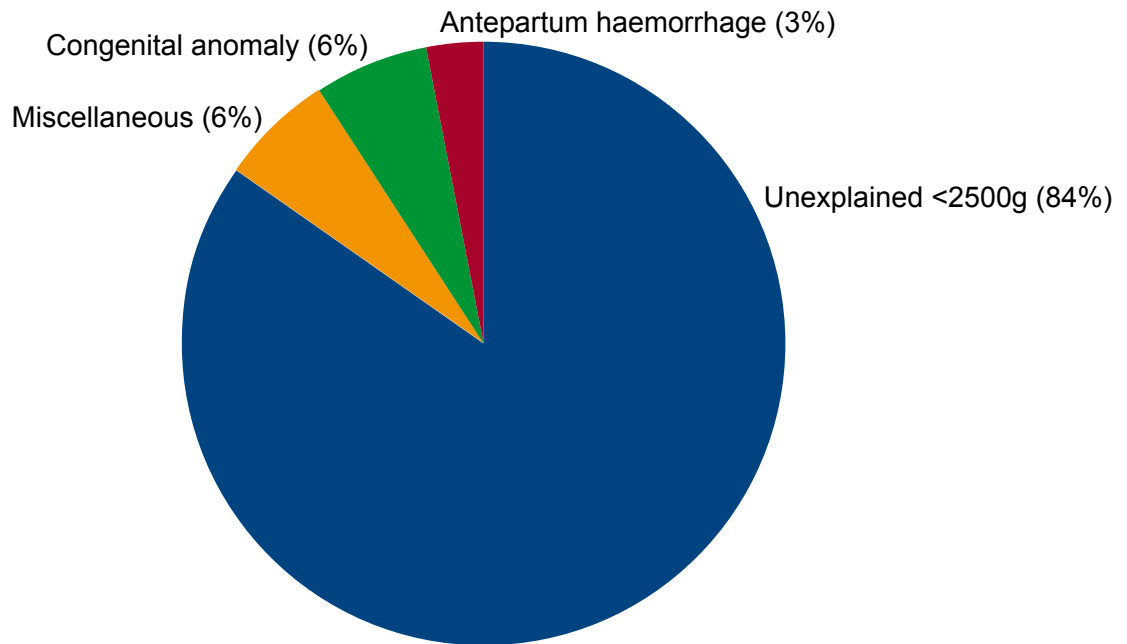
## Figures 4b Percentage distribution of cause of death; multiple births: 2009

### Multiple stillbirths by obstetric classification

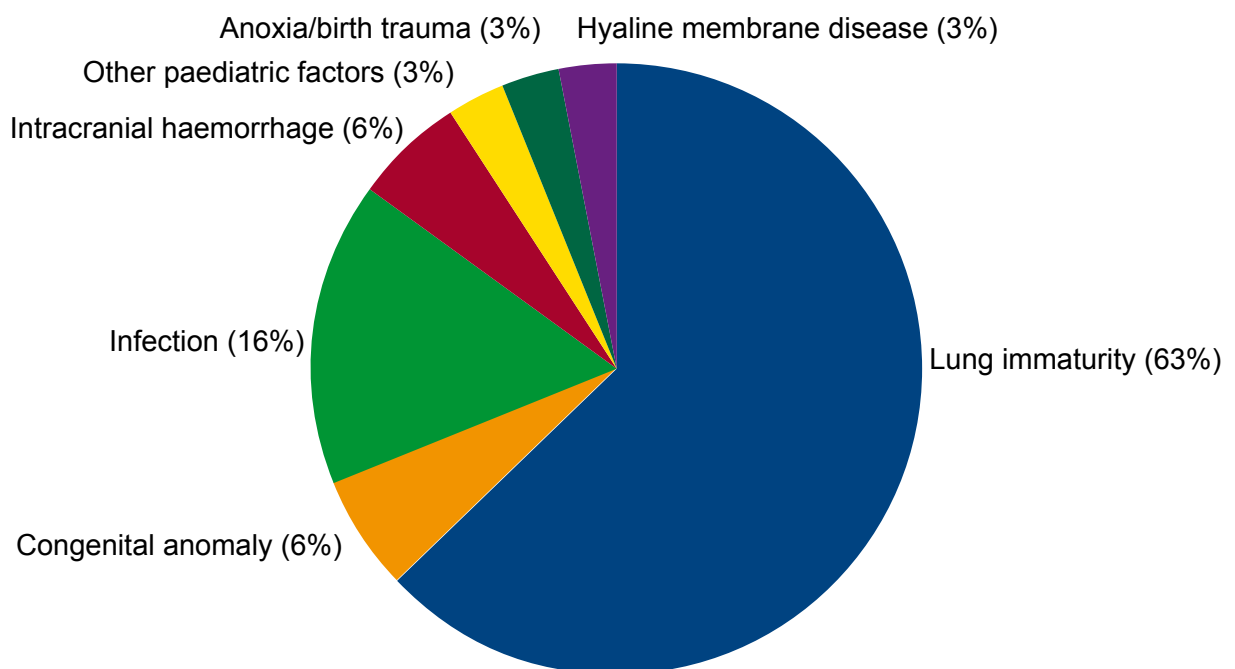




### Multiple neonatal deaths by obstetric classification



### Multiple neonatal deaths by paediatric classification



Source: Survey



A contributory factor to the high rate of 'unexplained' deaths is the relatively low rate of postmortem examinations but there was an encouraging rise in postmortems in 2009 among both stillbirths (59.3%) and neonatal deaths (37.6%). The rates in 2008 were 54.8% and 34.5% respectively. Detailed information by hospital is shown in Appendix 10.1 Table A12.

Histological examination of the placenta is now recognised as providing much information about the cause of death, particularly for stillbirths, but in 2009 this examination was only undertaken in 243 of the 317 stillbirths (76.5%).

The current classification system takes no account of placental histology and there is also no category for intrauterine growth restriction (IUGR). To investigate the contribution of these factors, it was recorded if each death had either of these features. This information is presented in Appendix 10.1 Tables A13-A18 where singleton and multiple births are combined. Information on histological placental dysfunction (HPD) was obtained from histological reports of the placenta which was often examined, especially in the case of stillbirths, even when there was no post-mortem examination of the baby. Confirmation of evidence of IUGR was usually only coded when there was a confirmatory postmortem unless there was clear and unequivocal clinical and/or ultrasonographic evidence of IUGR in the absence of a postmortem examination.

The detailed information in Appendix 10.1 Tables A13-A18 is summarised in Table 4. Of the 317 stillbirths, 137 (43.2%) had HPD and 68 (21.5%) IUGR. Among the 194 stillbirths classified as 'unexplained', 114 (58.8%) had HPD and 56 (28.9%) had evidence of IUGR. If all placentae were to be examined histologically, it is likely that the proportion of stillbirths with a histological abnormality of the placenta would be greater still.

**Table 4 Summary of proportion of histological placental dysfunction (HPD) and intrauterine growth restriction (IUGR) among late fetal deaths, stillbirths and neonatal deaths: 2009**

**a) all deaths**

	Late fetal death		Stillbirth		Neonatal death	
	No	%	No	%	No	%
<b>All</b>	<b>136</b>	<b>100.0</b>	<b>317</b>	<b>100.0</b>	<b>165</b>	<b>100.0</b>
HPD	22	16.2	137	43.2	9	5.5
IUGR	2	1.5	68	21.5	4	2.4

**b) deaths with 'unexplained' obstetric classification**

	Late fetal death		Stillbirth		Neonatal death	
	No	%	No	%	No	%
<b>All 'unexplained'</b>	<b>71</b>	<b>100.0</b>	<b>194</b>	<b>100.0</b>	<b>81</b>	<b>100.0</b>
HPD	15	21.1	114	58.8	6	7.4
IUGR	2	2.8	56	28.9	1	1.2



### 3.2 Birthweight and Gestation Specific Mortality Rates

The numbers and rates of stillbirths and of neonatal deaths among singleton babies in different birthweight and gestation groups at birth are shown in Appendix 10.1 Tables A19a and A19b. The rates rely on denominator data from SMR02, which (unlike birth registrations) records the birthweight and gestational age for all babies. SMR02 returns for the preceding year are often incomplete at the time of preparing the annual SPIMMR due to problems with the collection and transfer to ISD of data from some hospitals. Because of this deficiency (5.6% of singleton live births at the time of compiling this 2009 report), the rates for birthweight and gestational age obtained from the SMR02 returns to date (53,961 singleton live births) are applied to the 57,179 singleton live births registered with GROS. Although the proportions may change slightly when all SMR02 data is complete, it is unlikely that this will prove significant.

In 2009, 5.1% of all babies but 62.8% of stillbirths and 57.1% of neonatal deaths weighed <2500g; 0.9% of all babies, but 41.6% of stillbirths and 45.9% of neonatal deaths were born before 32 weeks gestation.

The stillbirth and neonatal mortality rates for the different birthweight and gestational age groups have not changed to any significant extent in recent years (Appendix 10.1 Tables A20 and A21). Only the rates for normally-formed babies are shown in these tables to eliminate some confounding factors. Among these, in 2009, the highest stillbirth rates were among babies <1500g birthweight (184.6 per 1000 births) and those <28 weeks gestation (299.1 per 1000) and the lowest at birthweight 3500 – 4499g (1.2 per 1000) and 37 weeks gestation or more (1.8 per 1000). The equivalent highest rates for neonatal deaths were 115.7 per 1000 live births (<1500g birthweight) and 213.9 per 1000 (<28 weeks gestation), while the lowest rates were 0.6 per 1000 (for both birthweight 2500g or more and for gestation 37 weeks or more). All of these rates are very similar to those for the rest of the UK in 2008<sup>1</sup>.

Prematurity is a particular risk for multiple pregnancies; 43 of the 47 babies of twin pregnancies who were stillborn or died in the neonatal period were born at less than 37 weeks gestation. Twenty four (51.1%) were born before 28 weeks gestation. Details are in Appendix 10.1 Table A22.

The causes of stillbirths and neonatal deaths can be further analysed by examining the proportion of such deaths which are small for gestational age (birthweight <5<sup>th</sup> centile for gestation). In Appendix 10.1 Table A23, this information is provided for normally-formed antepartum stillbirths and for intrapartum stillbirths and neonatal deaths combined (as they are likely to represent a continuum of related circumstances). As in previous years, the proportion of antepartum stillbirths small for gestational age (23.5%) is much higher than among intrapartum stillbirths and neonatal deaths (4.7%).

### 3.3 Gender Differences

Gender specific mortality rates are compared in Appendix 10.1 Table A24. In 2009, the stillbirth rate among males (5.0 per 1000 births) was lower than females (5.2 per 1000) but the neonatal mortality rate was 2.8 per 1000 live births for males and 1.8 per 1000 for females.



## 4 Late Fetal Deaths

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Information on late fetal deaths (deaths at 20 - 23 (+6) weeks gestation, or earlier in pregnancy if the birthweight is  $\geq 500\text{g}$ ) has been collected since 1991 and contributes to the overall picture of reproductive outcome in Scotland. These deaths are not registered with GROS and are identifiable only from SMR02 returns and from information volunteered by local hospital co-ordinators. In addition, some postmortem reports on such fetuses are sent directly by pathologists to the NHS QIS Reproductive Health Programme. Data on these fetal deaths are, nonetheless, less robust than those on stillbirths and neonatal deaths, are certainly not complete, and may fluctuate from year to year dependent on the level of case ascertainment.

In 2009, 136 late fetal deaths were identified. Ninety five miscarried spontaneously and in 41 cases the pregnancy was terminated, mainly because of fetal anomaly. The cause of death among singleton and multiple pregnancies according to the Scottish obstetric classification is shown in Appendix 10.1 Tables A25 and A26 where comparison is made with registered stillbirths. Apart from the distortion created by the high rate of termination for fetal anomaly among the late fetal deaths, no particular differences are discernible. The distribution of gestation and birth weights of the late fetal deaths is shown in Appendix 10.1 Table A27.



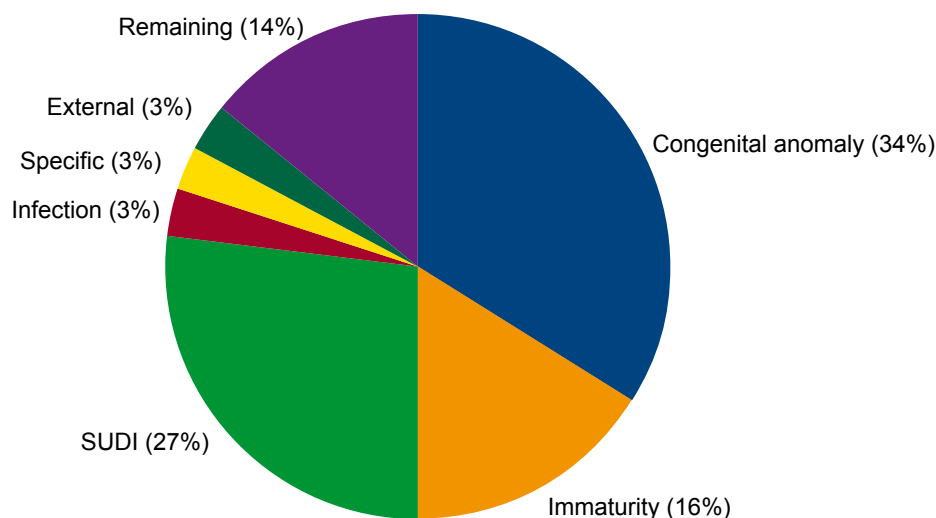
## 5 Post-neonatal Deaths

Post-neonatal infant deaths, i.e. those occurring after the first four weeks but within the first year of life, are not included in the detailed SSBID Survey. However, copies of the death certificates relating to these deaths are provided by GROS and some additional information is extracted from SMR02 returns. The causes of death have been classified, using the information available from the death certificate, into the eight categories in the scheme described by the ICE group<sup>7</sup>.

In 2009, there were 70 post-neonatal infant deaths. Appendix 10.1 Tables A28 to A31 summarise these in terms of age at death and cause and shows trends over recent years. As in previous years, the majority of the deaths (71% in 2009) occurred before six months of age. Congenital anomaly was the most frequent cause of death. After a fall to the lowest recorded rate for sudden unexpected death in infancy in 2008, the number of these deaths in 2009 rose to 19 (a rate of 0.32 per 1000 live births), but the precise classification of these deaths is unreliable and this rate remains lower than all other recent years. Postmortems were performed on all sudden unexpected infant deaths but much less frequently among other causes of death, presumably because the cause of death was usually apparent.

The proportions of deaths attributable to the various causes are presented graphically in Figure 5.

**Figure 5 Causes of post-neonatal death: 2009**





## 6 Congenital Anomalies

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There is a proposal to put in place a congenital anomaly audit for Scotland. Pending this development, the annual SPIMMR has, for a number of years, reported data on selected congenital anomalies. Information on birth prevalences among singleton pregnancies of neural tube defects, cardiovascular anomalies, orofacial clefts, and trisomies 13, 18 and 21 is presented in Appendix 10.1 Tables A32 and A33a. The rates in Appendix 10.1 Table A33b include, in addition, fetuses with these anomalies which were terminated. As it takes considerably longer to gather this anomaly data than mortality data, the information is always one year behind the rest of the report and includes the last decade up to 2008.

The difference between the rates in Appendix 10.1 Tables A33a and A33b appears to reflect the success of prenatal screening particularly for neural tube defects and chromosomal anomalies. The rates of neural tube defects reported at birth are consistently about half of the total rate reported when terminated pregnancies are included (0.48 per 1000 births and 0.90 per 1000 births respectively in 2008). The reduction in births with Down's Syndrome is about a third (0.85 per 1000 at birth and 1.34 per 1000 including terminated pregnancies). Spontaneous miscarriages (which probably occur frequently when anomalies are present) are not included in this data.

The most common congenital anomalies by a substantial margin are those of the heart and circulatory system. Many of these anomalies may not be detected antenatally and/or may be of minor significance and are not incompatible with normal life. There are, therefore, very few pregnancies terminated for anomalies in this group.



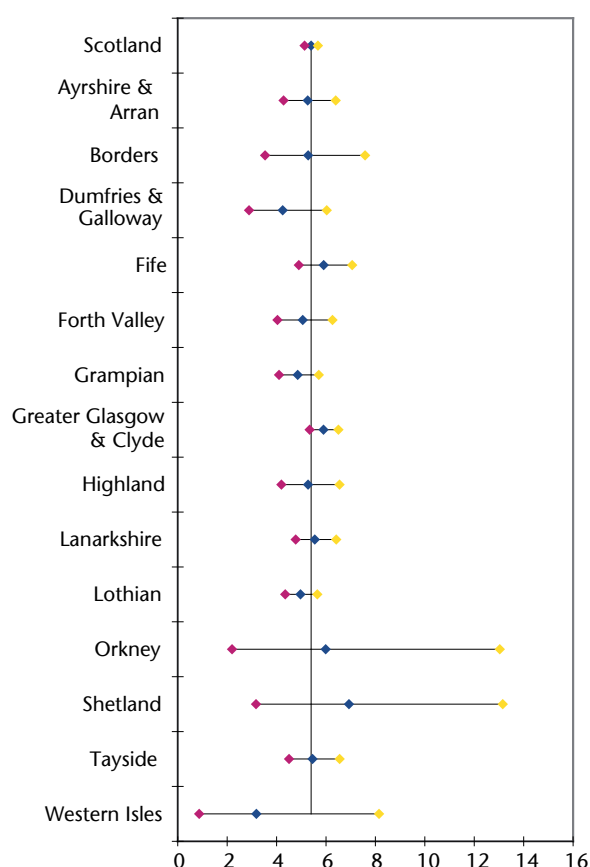
## 7 NHS Board Statistics

### 7.1 Stillbirths and Neonatal Deaths

The information presented for all deaths in Scotland included in this report is shown by individual NHS board in Appendix 10.1 Tables A34-A39. Comparisons with the previous six years for stillbirths and neonatal mortality is included in Appendix 10.1 Tables A34 and A35. It should be noted that Argyll and Clyde NHS board was incorporated into Highland NHS board and Greater Glasgow NHS board and their data is combined from 2007. The relatively small numbers of stillbirths and neonatal deaths each year in individual health board areas (especially in the smaller boards) mean that variations from year to year are generally not of significance. This effect is mitigated to some extent by aggregating years and Figures 6a and 6b show the stillbirth and neonatal mortality rates for individual NHS boards based on aggregated data for the past five years. The 95% confidence intervals are also shown. Even using data aggregated over five years, confidence intervals are wide and the differences among health boards are no greater than might be expected through chance. Differences in reproductive outcomes are also likely to be related to population differences with areas of high socio-economic deprivation experiencing higher mortality rates.

**Figure 6**

**a Stillbirth rates by NHS board of residence with 95% CI 2005-2009**



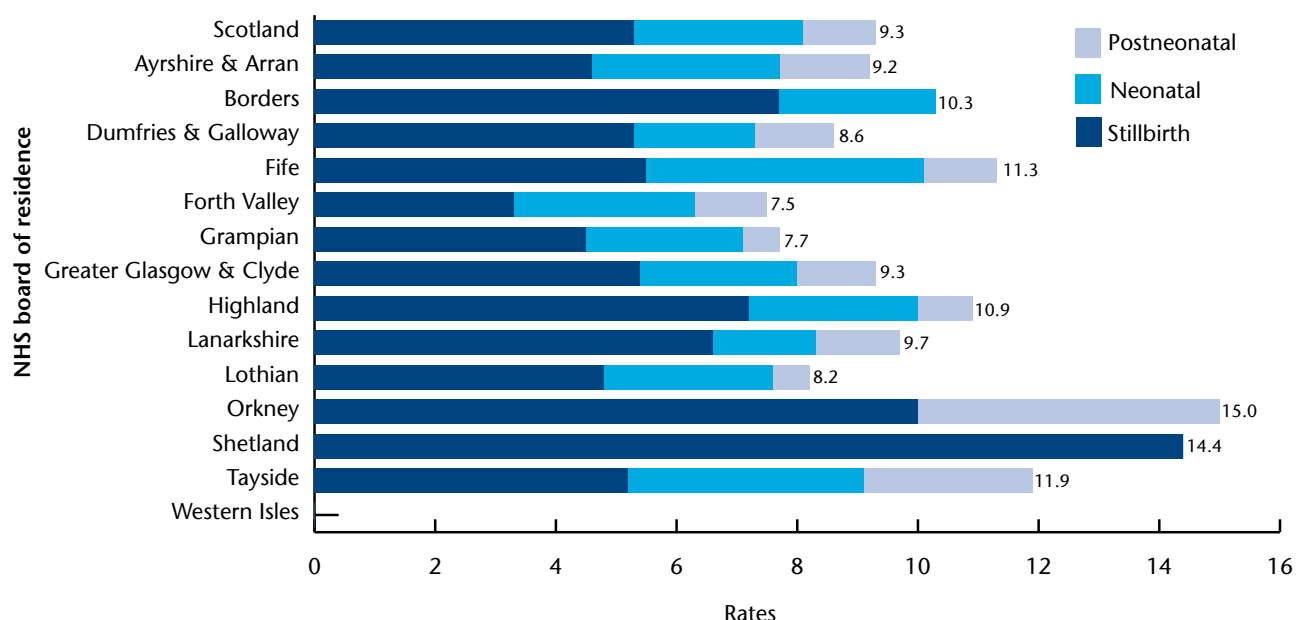
An error was recently identified in Fig 6b in the 2009 report. Please see Table A35 on page 46 in SPIMMR 2009 for correct information, or for up to date analysis page 20 of SPIMMR 2010.



## 7.2 Extended Mortality Rates and Causes of Death

All of the deaths in different NHS board areas described in this report (late fetal deaths, stillbirths, neonatal deaths and post-neonatal deaths) are summarised in Appendix 10.1 Tables A37 which provides an overview of all reproductive losses from mid-pregnancy to the end of the first year of life. For Scotland as a whole, the extended perinatal mortality rate was 11.6 per 1000 total births including late fetal deaths (95% CI, 10.7-12.5). This is similar to recent years but is not entirely accurate because of the variable reporting of late fetal losses. The stillbirth, neonatal death and post-neonatal death rates for each health board are summarised graphically in Figure 7. The aim of combining rates in this way is to eliminate any spurious differences among health boards caused by misclassification or by deferring death from one time period to another. Late fetal deaths have been excluded from Figure 7.

**Figure 7 Stillbirth, neonatal and post-neonatal mortality rates; by NHS board of residence: 2009**



Source: GROS

Also included in the appendix is information on the outcome of multiple pregnancies by NHS board (Appendix 10.1 Table A38) and of causes of all stillbirths and neonatal deaths by the broad Wigglesworth classification<sup>8</sup> (Appendix 10.1 Table A39).

The small number of losses make comparisons among NHS boards of little value. Numbers can fluctuate significantly from year to year, particularly in the smaller NHS boards where one or two fewer or more losses in a given year can make a large difference to the reported rate.

## 7.3 Congenital Anomalies

The information on selected congenital anomalies in Scotland discussed above in section 6 is shown by NHS boards for five years aggregated (2004-2008) in Appendix 10.1 Tables A42 and rates are charted graphically for neural tube defects, Down's Syndrome and heart and circulatory system anomalies in Appendix 10.1 Figure A41. There is no evidence of a significant variation in rate among NHS boards for the first two anomalies but there is marked variation in the prevalence of anomalies of the heart and circulatory system. Ignoring smaller board areas where small numbers make analysis difficult, rates for the 5 years vary from 4.97 per 1000 births (Forth Valley) to 16.84 (Highland). The establishment of a national congenital anomaly audit might help the exploration of the reasons for these differences.



## 8 Conclusions

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The collection of information and the annual publication of this report is important to create a continuous database to reflect birth outcomes in Scotland both at a single point in time and over a period of time. It is recognised, however, that each annual report may not show great variation from year to year. Examining trends over a longer period of time (as in the recent report summarising three decades of data collection<sup>3</sup>) is likely to provide valuable information and consideration should be given to producing such an analysis every five years.

As discussed in detail in the 2008 SPIMMR report, work is progressing to improve the process and detail of data collection and to report the causes of deaths using a modern classification system which reflects current knowledge. The value of this development is again demonstrated in this report which repeats the findings of the 2008 report in identifying the contribution of placental dysfunction and intrauterine growth restriction to stillbirths in particular. A short life working group under the oversight of SPMMRAG has produced a substantially revised data collection form with an associated classification system (see appendix 10.9). The new process commences for deaths occurring in 2011. CMACE has been using a similar process and classification system for the rest of the United Kingdom for the past two years. From 2011, comparing data should prove more simple. The recommendations included (for the first time) in this report encourage the continuation of this work.

Interpretation of small fluctuations in rates from year to year is difficult, but it is encouraging that the low perinatal mortality rate reported in 2008 was maintained in 2009. The rising trend in the rate of postmortem examinations for stillbirths has continued although this has not, as yet, reduced the number of stillbirths classified as 'unexplained'. In the light of the increasing understanding of the role of histologically recognisable placental dysfunction as an important factor in perinatal deaths, it is important that the placentae from all stillbirths and from live births that may appear vulnerable to neonatal death are sent for histological examination by a pathologist with expertise in the area. The placenta was so examined in only 77% of stillbirths in 2009.

The number of infants dying in the post-neonatal period (one month to one year of age) was, at 70, the lowest number ever. Sudden unexpected death in infancy is the subject of a project currently being undertaken by the Reproductive Health Programme of NHS QIS with funding from the Scottish Government.

The challenges identified in this report are not new; the stubbornly persistent stillbirth rate which has changed little in 20 years; the contribution of prematurity to neonatal mortality, particularly in multiple pregnancies; the need for a better understanding and explanation of stillbirths. In future years, this report will provide more information to help overcome these challenges by the planned reclassification of the causes of death and by providing more information on demographic risk factors. Central to this process is the collection of good quality, complete data in maternity and neonatal units. At present, adequate information is not obtained for a significant proportion of cases. In 2009, no additional data beyond that on the General Registry Office certification and some data from SMR02 returns was available for 6% of singleton stillbirths and 12% of singleton neonatal deaths. Information from units for multiple pregnancy deaths was more complete. It is hoped that the renewed system of data collection and revitalised engagement with co-ordinators who provide data from maternity and neonatal units will help to address this problem.



The process commenced in this report, to render it more accessible and useful, should continue, so that the information can be fully used by the clinical community to improve birth outcomes in Scotland.

The continuation of the reporting of congenital anomalies in the SPIMMR is somewhat anomalous and is the reason for including the term 'morbidity' in the report's title. Rudimentary plans have been discussed with a view to establishing a congenital anomaly audit for Scotland. Should these come to fruition, this would allow separate and more detailed analysis of these conditions and would encourage further exploration of any regional variations such as appears to be the case for heart and circulatory disorders.



## 9 References

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# 10 Appendices

## 10.1 Tables

**Table A5 FIGO tabulation: 2000-2009**

	2000	2001	2002	2003	2004	2005	2006	2007	2008 <sup>1</sup>	2009 <sup>1</sup>
Registered Births	53374	52828	51548	52728	54274	54678	55986	58108	60354	59351
<b>Less than 500g</b>										
Total	35	41	34	46	31	32	39	62	32	49
Stillbirths	23	26	27	28	19	17	25	37	21	37
END	11	14	6	17	12	14	12	24	11	12
LND	1	1	1	1	-	1	2	1	-	-
<b>500g or over</b>										
Total births	53339	52787	51514	52682	54243	54646	55947	58046	60322	59302
Stillbirths	274	272	248	268	298	274	268	288	304	279
END	126	131	91	111	110	113	102	102	95	92
LND	54	45	46	49	44	52	48	58	44	45
<b>of which with lethal malformations</b>										
Total births	86	82	58	72	75	91	73	63	75	79
Stillbirths	35	32	22	29	42	39	29	21	34	39
END	34	37	25	30	22	38	33	30	31	26
LND	17	13	11	13	11	14	11	12	10	14
<b>1000g or over</b>										
Total births	53072	52542	51343	52434	54000	54375	55702	57803	60062	59089
Stillbirths	205	216	194	204	215	200	209	220	239	212
END	66	78	50	61	57	70	66	59	59	65
LND	33	24	25	30	24	28	27	34	34	27
<b>of which with lethal malformations</b>										
Total births	66	65	48	60	55	72	64	49	62	61
Stillbirths	24	20	16	22	28	28	22	11	25	24
END	26	34	23	27	18	31	32	26	28	23
LND	16	11	9	11	9	13	10	12	9	14
<b>Excluding all births &lt;500g</b>										
Major Malformation rate	1.68	1.55	1.13	1.36	1.38	1.67	1.30	1.09	1.24	1.33
Stillbirth rate	5.13	5.15	4.81	5.08	5.49	5.01	4.79	4.96	5.04	4.70
Neonatal rate	3.39	3.35	2.67	3.05	2.85	3.03	2.69	2.77	2.32	2.32
Perinatal rate	7.49	7.63	6.58	7.19	7.52	7.08	6.61	6.72	6.61	6.26
<b>Excluding all major malformations and other births &lt;500g</b>										
Stillbirth rate	4.48	4.55	4.39	4.54	4.73	4.31	4.28	4.60	4.48	4.05
Neonatal rate	2.43	2.40	1.97	2.23	2.24	2.08	1.91	2.04	1.63	1.64
Perinatal rate	6.21	6.34	5.67	6.08	6.35	5.68	5.51	5.85	5.54	5.17
<b>Excluding all births &lt;1000g</b>										
Stillbirth rate	3.86	4.11	3.78	3.89	3.98	3.68	3.75	3.81	3.98	3.59
Neonatal rate	1.87	1.95	1.47	1.74	1.51	1.81	1.68	1.62	1.55	1.56
Perinatal rate	5.10	5.60	4.75	5.05	5.04	4.97	4.94	4.83	4.96	4.69
<b>Excluding all major malformations and other births &lt;1000g</b>										
Stillbirth rate	3.41	3.73	3.47	3.47	3.47	3.17	3.36	3.62	3.57	3.18
Neonatal rate	1.07	1.09	0.84	1.01	1.00	1.00	0.92	0.96	0.94	0.93
Perinatal rate	4.16	4.57	4.00	4.12	4.19	3.89	3.97	4.19	4.08	3.90

<sup>1</sup> Excludes any births < 22 wks gestation.



**Table A6 Registered singleton and multiple pregnancies: 2003-2009**

	2003	2004	2005	2006	2007	2008	2009
Singleton pregnancies	51084	52736	52968	54240	56309	58433	57473
Twin pregnancies	810	757	843	858	882	953	922
Triplet pregnancies	8	8	8	10	9	9	14
Quadruplet pregnancies	-	-	-	-	2	-	1
Quintuplet pregnancies	-	-	-	-	-	-	-
Twinning rate (per 1000 maternities)	15.6	14.2	15.7	15.6	15.4	16.0	15.8

Source: GROS

**Table A7 Stillbirth and neonatal deaths for singleton and multiple births: 2003-2009**

	2003	2004	2005	2006	2007	2008	2009
Total Births	52728	54274	54678	55986	58108	60366	59363
Singleton	51079	52732	52968	54240	56303	58427	57471
Multiple	1649	1542	1710	1746	1805	1939	1892
Stillbirths	296	317	292	296	327	325	317
Singleton	260	294	273	270	298	298	293
Multiple	36	23	19	26	29	27	24
Neonatal deaths	178	166	190	172	188	168	165
Singleton	126	134	159	138	156	137	133
Multiple	52	32	31	34	32	31	32
Stillbirth mortality rate <sup>1</sup>	5.6	5.8	5.3	5.3	5.6	5.4	5.3
Singleton	5.1	5.6	5.2	5.0	5.3	5.1	5.1
Multiple	21.8	14.9	11.1	14.9	16.1	13.9	12.7
Neonatal mortality rate <sup>2</sup>	3.4	3.1	3.5	3.1	3.3	2.8	2.8
Singleton	2.5	2.6	3.0	2.6	2.8	2.4	2.3
Multiple	32.2	21.1	18.3	19.8	18.0	16.2	17.1

<sup>1</sup> Rate per 1000 singleton or multiple total births.

<sup>2</sup> Rate per 1000 singleton or multiple live births.

Source: GROS &amp; Survey



**Table A8 Stillbirths, neonatal deaths and late fetal deaths by obstetric classification and time of death, single/multiple: 2009**

	Total		AP Stillbirth		IP Stillbirth		END		LND		LFD	
	s	m	s	m	s	m	s	m	s	m	s	m
<b>Total</b>	<b>550</b>	<b>68</b>	<b>274</b>	<b>23</b>	<b>19</b>	<b>1</b>	<b>98</b>	<b>22</b>	<b>35</b>	<b>10</b>	<b>124</b>	<b>12</b>
CNS	22	7	8	6	1	-	5	1	-	-	8	-
CVS	23	1	4	-	-	-	7	1	8	-	4	-
Renal	13	-	3	-	-	-	3	-	-	-	7	-
Alimentary	-	-	-	-	-	-	-	-	-	-	-	-
Chromosomal	21	1	9	1	1	-	4	-	-	-	7	-
Biochemical	3	-	-	-	-	-	-	-	3	-	-	-
Other	35	3	12	3	1	-	10	-	3	-	9	-
Rhesus Incompatibility	-	-	-	-	-	-	-	-	-	-	-	-
Non-rhesus Incompatibility	-	-	-	-	-	-	-	-	-	-	-	-
Severe Toxaemia	13	-	7	-	-	-	3	-	3	-	-	-
Other Toxaemia	2	-	2	-	-	-	-	-	-	-	-	-
Abruptio Placentae	61	3	32	1	4	-	12	1	2	-	11	1
Placenta Praevia	2	-	-	-	-	-	1	-	-	-	1	-
Other APH	18	-	4	-	-	-	5	-	2	-	7	-
Breech	2	-	1	-	1	-	-	-	-	-	-	-
Cord Prolapse	-	-	-	-	-	-	-	-	-	-	-	-
Other Mechanical	5	-	2	-	-	-	3	-	-	-	-	-
Maternal Trauma	-	-	-	-	-	-	-	-	-	-	-	-
Essential Hypertension	-	-	-	-	-	-	-	-	-	-	-	-
Diabetes	8	-	7	-	-	-	-	-	-	-	1	-
Abdominal Operations in Pregnancy	-	-	-	-	-	-	-	-	-	-	-	-
Other (incl infection)	13	-	7	-	-	-	-	-	1	-	5	-
Miscellaneous	1	12	-	6	-	-	-	1	1	1	-	4
Unexplained <2500	206	41	108	6	2	1	24	18	8	9	64	7
Unexplained ≥2500	99	-	68	-	9	-	19	-	3	-	-	-
Postnatal Cause Only	3	-	-	-	-	-	2	-	1	-	-	-

s Singleton  
m Multiple



**Table A9 Stillbirths, neonatal deaths and late fetal deaths by paediatric classification and time of death, single/multiple: 2009**

	Total		AP Stillbirth		IP Stillbirth		END		LND		LFD	
	s	m	s	m	s	m	s	m	s	m	s	m
<b>Total</b>	<b>550</b>	<b>68</b>	<b>274</b>	<b>23</b>	<b>19</b>	<b>1</b>	<b>98</b>	<b>22</b>	<b>35</b>	<b>10</b>	<b>124</b>	<b>12</b>
CNS	22	7	8	6	1	-	5	1	-	-	8	-
CVS	23	1	4	-	-	-	7	1	8	-	4	-
Renal	13	-	3	-	-	-	3	-	-	-	7	-
Alimentary	-	-	-	-	-	-	-	-	-	-	-	-
Chromosomal	21	1	9	1	1	-	4	-	-	-	7	-
Biochemical	3	-	-	-	-	-	-	-	3	-	-	-
Other	35	3	12	3	1	-	10	-	3	-	9	-
Rhesus Incompatibility	-	-	-	-	-	-	-	-	-	-	-	-
Non-rhesus Incompatibility	-	-	-	-	-	-	-	-	-	-	-	-
Antepartum Anoxia	338	16	232	8	7	-	13	1	5	-	81	7
Intrapartum Anoxia	28	-	-	-	7	-	21	-	-	-	-	-
Birth Trauma	2	-	-	-	-	-	2	-	-	-	-	-
Lung Immaturity	22	21	-	-	-	-	18	14	4	6	-	1
HMD with IVH	1	1	-	-	-	-	1	1	-	-	-	-
HMD without IVH	1	-	-	-	-	-	-	-	1	-	-	-
IVH with mild HMD	2	2	-	-	-	-	1	1	1	1	-	-
IVH with no HMD	-	-	-	-	-	-	-	-	-	-	-	-
Subarachnoid haemorrhage	-	-	-	-	-	-	-	-	-	-	-	-
Subdural Haemorrhage	-	-	-	-	-	-	-	-	-	-	-	-
Intracerebral Haemorrhage	1	-	-	-	-	-	1	-	-	-	-	-
Necrotising enterocolitis	4	-	-	-	-	-	1	-	3	-	-	-
Antenatal Infection	7	-	2	-	-	-	-	-	-	-	5	-
Intranatal Infection	12	3	4	-	2	1	1	2	2	-	3	-
Other postnatal infection	3	3	-	-	-	-	1	-	2	3	-	-
Disseminated intravascular coagulation	-	-	-	-	-	-	-	-	-	-	-	-
Pulmonary haemorrhage	1	-	-	-	-	-	1	-	-	-	-	-
Other Haemorrhage	-	-	-	-	-	-	-	-	-	-	-	-
Other Paediatric Factors	6	10	-	5	-	-	5	1	1	-	-	4
Unexplained	5	-	-	-	-	-	3	-	2	-	-	-

s Singleton

m Multiple



**Table A10 Multiple stillbirths and neonatal deaths by obstetric classification: 2009**

Obstetric Classification	Stillbirth	END	LND	Stillbirth <sup>1</sup>	Neonatal mortality <sup>2</sup>
	Numbers			Rates	
<b>Total</b>	<b>24</b>	<b>22</b>	<b>10</b>	<b>12.7</b>	<b>17.1</b>
Congenital anomaly	10	2	-	5.3	1.1
Isoimmunisation	-	-	-	-	-
Hypertension of pregnancy	-	-	-	-	-
Antepartum haemorrhage	1	1	-	0.5	0.5
Trauma/mechanical	-	-	-	-	-
Maternal disorder	-	-	-	-	-
Miscellaneous	6	1	1	3.2	1.1
Unexplained <2500g	7	18	9	3.7	14.5
Unexplained ≥2500g	-	-	-	-	-
Postnatal cause only	-	-	-	-	-

1 Rate per 1000 singleton total births.

2 Rate per 1000 singleton live births.

Source: Survey

**Table A11 Multiple stillbirths and neonatal deaths by paediatric classification: 2009**

Paediatric Classification	Stillbirth	END	LND	Stillbirth <sup>1</sup>	Neonatal mortality <sup>2</sup>
	Numbers			Rates	
<b>Total</b>	<b>24</b>	<b>22</b>	<b>10</b>	<b>12.7</b>	<b>17.1</b>
Congenital anomaly	10	2	-	5.3	1.1
Isoimmunisation	-	-	-	-	-
Anoxia/birth trauma	8	1	-	4.2	0.5
Lung immaturity	-	14	6	-	10.7
Hyaline membrane disease	-	1	-	-	0.5
Intracranial Haemorrhage	-	1	1	-	1.1
Infection	1	2	3	0.5	2.7
Other haemorrhage	-	-	-	-	-
Other paediatric factors	5	1	-	2.6	0.5
Unexplained	-	-	-	-	-

1 Rate per 1000 singleton total births.

2 Rate per 1000 singleton live births.

Source: Survey



**Table A12 Postmortem examinations of late fetal deaths, stillbirths and neonatal deaths by hospital: 2009**

NHS board/hospital of death	Late fetal deaths		Stillbirths		Neonatal deaths		All events	
	Number	% with PM	Number	% with PM	Number	% with PM	Number	% with PM
<b>Scotland</b>	<b>136</b>	<b>61.8</b>	<b>317</b>	<b>59.3</b>	<b>165</b>	<b>37.6</b>	<b>617</b>	<b>54.0</b>
<b>Ayrshire &amp; Arran</b>								
Crosshouse Hospital	14	50.0	15	53.3	12	66.7	41	56.1
<b>Borders</b>								
Borders General Hospital	-	-	9	66.7	1	0.0	10	60.0
<b>Dumfries &amp; Galloway</b>								
Dumfries & Galloway Royal Infirmary	11	63.6	7	85.7	3	0.0	21	61.9
<b>Fife</b>								
Forth Park Maternity Hospital	9	33.3	22	54.5	17	35.3	48	43.8
Other <sup>1</sup>	-	-	-	-	1	100.0	1	100.0
<b>Forth Valley</b>								
Stirling Royal Infirmary	11	72.7	10	50.0	8	0.0	29	44.8
Other <sup>1</sup>	1	100.0	1	100.0	-	-	2	100.0
<b>Grampian</b>								
Aberdeen Maternity Hospital	26	42.3	32	50.0	11	0.0	69	39.1
Dr. Gray's Hospital	2	0.0	5	80.0	-	-	7	57.1
Royal Aberdeen Childrens Hospital	-	-	-	-	1	100.0	1	100.0
<b>Greater Glasgow &amp; Clyde</b>								
Glasgow Royal Maternity Hospital	13	76.9	33	51.5	6	0.0	52	51.9
Southern General Hospital	12	83.3	21	81.0	7	28.6	40	72.5
Royal Hospital for Sick Children	-	-	-	-	15	13.3	15	13.3
The Queen Mother's Hospital	7	100.0	21	52.4	10	40.0	38	57.9
Royal Alexandra Hospital	9	55.6	16	50.0	7	42.9	32	50.0
<b>Highland</b>								
Caithness General Hospital	1	0.0	2	50.0	-	-	3	33.3
Raigmore Hospital	-	-	13	76.9	7	42.9	20	65.0
Other <sup>1</sup>	-	-	2	0.0	1	0.0	3	0.0
<b>Lanarkshire</b>								
Wishaw General Hospital	11	72.7	36	41.7	7	42.9	54	48.1
Other <sup>1</sup>	-	-	1	100.0	1	0.0	1	50.0
<b>Lothian</b>								
Royal Hospital for Sick Children	-	-	-	-	2	0.0	2	0.0
St. John's at Howden	-	-	6	66.7	2	100.0	8	75.0
Royal Infirmary of Edinburgh	2	100.0	42	78.6	28	57.1	72	70.8
<b>Tayside</b>								
Ninewells Hospital	7	71.4	23	56.5	17	58.8	47	59.6
Montrose Royal Infirmary	-	-	-	-	1	100.0	1	100.0
<b>Islands</b>	-	-	-	-	-	-	-	-

<sup>1</sup> Includes births at home.

Source: Survey



**Table A13 Histological placental dysfunction by obstetric classification: 2009**

Obstetric Classification	LFD	Stillbirth	NND	END	LND
<b>Total</b>	<b>22</b>	<b>137</b>	<b>9</b>	<b>9</b>	<b>-</b>
Congenital anomaly	-	3	1	1	-
Isoimmunisation	-	-	-	-	-
Hypertension of pregnancy	-	6	1	1	-
Antepartum haemorrhage	3	10	1	1	-
Trauma/mechanical	-	-	-	-	-
Maternal disorder	1	3	-	-	-
Miscellaneous	3	1	-	-	-
Postnatal cause only	-	-	-	-	-
Unexplained <2500g	15	72	2	2	-
Unexplained ≥2500g	-	42	4	4	-

**Table A14 Intrauterine growth restriction by obstetric classification: 2009**

Obstetric Classification	LFD	Stillbirth	NND	END	LND
<b>Total</b>	<b>2</b>	<b>68</b>	<b>4</b>	<b>3</b>	<b>1</b>
Congenital anomaly	-	5	1	1	-
Isoimmunisation	-	-	-	-	-
Hypertension of pregnancy	-	4	1	1	-
Antepartum haemorrhage	-	2	-	-	-
Trauma/mechanical	-	-	-	-	-
Maternal disorder	-	1	-	-	-
Miscellaneous	-	-	-	-	-
Postnatal cause only	-	-	-	-	-
Unexplained <2500g	2	44	1	1	-
Unexplained ≥2500g	-	12	1	-	1



**Table A15 All stillbirths, neonatal deaths and late fetal deaths by obstetric classification: 2009**

Obstetric Classification	LFD	Stillbirth	NND	END	LND
<b>Total</b>	<b>136</b>	<b>317</b>	<b>165</b>	<b>120</b>	<b>45</b>
Congenital anomaly	35	49	45	31	14
Isoimmunisation	-	-	-	-	-
Hypertension of pregnancy	-	9	6	3	3
Antepartum haemorrhage	20	41	23	19	4
Trauma/mechanical	-	4	3	3	-
Maternal disorder	6	14	1	-	1
Miscellaneous	4	6	3	1	2
Postnatal cause only	-	-	3	2	1
Unexplained <2500g	71	117	59	42	17
Unexplained ≥2500g	-	77	22	19	3

**Table A16 Histological placental dysfunction by paediatric classification: 2009**

Paediatric Classification	LFD	Stillbirth	NND	END	LND
<b>Total</b>	<b>22</b>	<b>137</b>	<b>9</b>	<b>9</b>	<b>-</b>
Congenital anomaly	-	3	1	1	-
Isoimmunisation	-	-	-	-	-
Anoxia/birth trauma	17	133	6	6	-
Lung immaturity	-	-	-	-	-
Hyaline membrane disease	-	-	1	1	-
Intracranial haemorrhage	-	-	-	-	-
Infection	2	-	-	-	-
Other haemorrhage	-	-	1	1	-
Other paediatric factors	3	1	-	-	-
Unexplained	-	-	-	-	-



**Table A17 Intrauterine growth restriction by paediatric classification: 2009**

Paediatric Classification	LFD	Stillbirth	NND	END	LND
<b>Total</b>	<b>2</b>	<b>68</b>	<b>4</b>	<b>3</b>	<b>1</b>
Congenital anomaly	-	5	1	1	-
Isoimmunisation	-	-	-	-	-
Anoxia/birth trauma	2	63	1	-	1
Lung immaturity	-	-	-	-	-
Hyaline membrane disease	-	-	1	1	-
Intracranial haemorrhage	-	-	-	-	-
Infection	-	-	-	-	-
Other haemorrhage	-	-	1	1	-
Other paediatric factors	-	-	-	-	-
Unexplained	-	-	-	-	-

**Table A18 All stillbirths, neonatal deaths and late fetal deaths by paediatric classification: 2009**

Paediatric Classification	LFD	Stillbirth	NND	END	LND
<b>Total</b>	<b>136</b>	<b>317</b>	<b>165</b>	<b>120</b>	<b>45</b>
Congenital anomaly	35	49	45	31	14
Isoimmunisation	-	-	-	-	-
Anoxia/birth trauma	88	254	42	37	5
Lung immaturity	1	-	42	32	10
Hyaline membrane disease	-	-	3	2	1
Intracranial haemorrhage	-	-	5	3	2
Infection	8	9	15	5	10
Other haemorrhage	-	-	1	1	-
Other paediatric factors	4	5	7	6	1
Unexplained	-	-	5	3	2



**Table A19a Singleton live births, stillbirths and neonatal deaths by birthweight: 2009<sup>p</sup>**

Birthweight (g)	Live births Number <sup>p</sup>	%	GRO Live births Number	Stillbirths Number	%	NND Number	%
<b>Total</b>	<b>53961</b>	<b>100.0</b>	<b>57179</b>	<b>293</b>	<b>100.0</b>	<b>133</b>	<b>100.0</b>
<1500	405	0.7	421	124	42.3	54	40.6
1500-2499	2391	4.4	2504	60	20.5	22	16.5
2500-3499	26287	48.7	27856	77	26.3	31	23.3
3500-4499	23573	43.7	24990	29	9.9	22	16.5
4500+	1247	2.3	1344	2	0.7	0	-
Not known	58	0.1	66	1	0.3	4	3.0

p Provisional SMR02.

Source: SMR02 and Survey

**Table A19b Singleton live births, stillbirths and neonatal deaths by gestation: 2009<sup>p</sup>**

Gestation (weeks)	Live births Number <sup>p</sup>	%	GRO Live births Number	Stillbirths Number	%	NND Number	%
<b>Total</b>	<b>53961</b>	<b>100.0</b>	<b>57179</b>	<b>293</b>	<b>100.0</b>	<b>133</b>	<b>100.0</b>
<24	15	0.0	16	-	-	19	14.3
24-27	121	0.2	124	75	25.6	28	21.1
28-31	337	0.6	357	47	16.0	14	10.5
32-36	2698	5.0	2851	67	22.9	15	11.3
37+	50753	94.1	53791	104	35.5	55	41.4
Not known	37	0.1	41	-	-	2	1.5

p Provisional SMR02.

Source: SMR02 and Survey



**Table A20a Normally-formed birthweight specific singleton stillbirth mortality rates<sup>1</sup>: 2003-2009**

Birthweight (g)	2003	2004	2005	2006	2007	2008	2009 <sup>p</sup>
<b>Total</b>	<b>5.0</b>	<b>5.0</b>	<b>4.6</b>	<b>4.6</b>	<b>5.3</b>	<b>4.6</b>	<b>4.4</b>
<1500	184.3	186.7	186.0	157.4	203.7	166.5	184.6
1500-2499	23.8	22.3	18.5	23.9	25.3	21.6	20.4
2500-3499	2.7	2.5	2.5	2.8	3.1	3.1	2.6
3500-4499	1.0	1.4	1.1	1.2	0.9	1.0	1.2
4500+	2.1	3.6	3.6	0.8	1.8	0.8	1.5

<sup>1</sup> Rate per 1000 total births (excludes stillbirths and neonatal deaths with lethal malformations).

<sup>p</sup> Provisional SMR02.

**Table A20b Normally-formed gestation specific singleton stillbirth mortality rates<sup>1</sup>: 2003-2009**

Gestation (weeks)	2003	2004	2005	2006	2007	2008	2009 <sup>p</sup>
<b>Total</b>	<b>5.0</b>	<b>5.0</b>	<b>4.6</b>	<b>4.6</b>	<b>5.3</b>	<b>4.6</b>	<b>4.4</b>
<24	-	-	-	-	-	-	-
24-27	289.2	309.4	252.7	272.3	370.2	239.6	299.1
28-31	100.5	103.0	123.6	85.1	117.3	101.9	89.0
32-36	24.7	24.9	17.9	22.0	25.8	21.2	21.5
37+	2.0	1.9	2.0	2.0	2.0	2.1	1.8

<sup>1</sup> Rate per 1000 total births (excludes stillbirths and neonatal deaths with lethal malformations).

<sup>p</sup> Provisional SMR02.

Source: SMR02 and Survey



**Table A21a Normally-formed birthweight specific singleton neonatal mortality rates<sup>1</sup>: 2003-2009**

Birthweight (g)	2003	2004	2005	2006	2007	2008	2009 <sup>p</sup>
<b>Total</b>	<b>1.8</b>	<b>2.0</b>	<b>2.1</b>	<b>1.8</b>	<b>2.1</b>	<b>1.7</b>	<b>1.6</b>
<1500	139.6	129.5	147.4	125.3	175.1	109.0	115.7
1500-2499	2.5	3.5	4.6	3.3	4.2	2.9	2.4
2500-3499	0.6	0.7	1.0	0.8	0.7	0.9	0.6
3500-4499	0.2	0.5	0.1	0.4	0.3	0.2	0.6
4500+	1.0	1.8	-	-	-	1.5	-

1 Rate per 1000 total births (excludes stillbirths and neonatal deaths with lethal malformations).

p Provisional SMR02.

**Table A21b Normally-formed gestation specific singleton neonatal mortality rates<sup>1</sup>: 2003-2009**

Gestation (weeks)	2003	2004	2005	2006	2007	2008	2009 <sup>p</sup>
<b>Total</b>	<b>1.8</b>	<b>2.0</b>	<b>2.1</b>	<b>1.8</b>	<b>2.1</b>	<b>1.7</b>	<b>1.6</b>
<24	*	*	*	*	*	*	*
24-27	245.8	248.0	279.4	237.4	263.2	162.8	213.9
28-31	42.3	36.4	34.5	20.3	57.4	18.2	25.5
32-36	2.9	2.6	3.0	3.1	2.4	3.3	2.1
37+	0.3	0.5	0.6	0.6	0.5	0.6	0.6

1 Rate per 1000 live births (excludes neonatal deaths with lethal malformations).

\* Rates not calculated as SMR02 data is incomplete.

p Provisional SMR02.

Source: SMR02 and Survey



**Table A22 Stillbirths and neonatal deaths by gestation for twins: 2009**

Gestation	Both twins died		Twin 1 died		Twin 2 died		Total
	Stillbirth	NND	Stillbirth	NND	Stillbirth	NND	
Total	9	9	4	4	11	10	47
<20	-	-	-	-	-	-	-
20-23	-	4	-	2	-	1	7
24-27	7 (2)	5	-	-	1	4	17
28-36	2	-	3 (1)	2 (1)	7 (4)	5 (1)	19
37-41	-	-	1	-	3 (3)	-	4
Not known	-	-	-	-	-	-	-

Includes 3 sets of twins where one twin suffered a neonatal death and the co-twin suffered a postneonatal death or late fetal death.  
Includes 12 deaths from congenital anomaly (shown in brackets).

Source: Survey

#### Other Twins

1 set where one twin was a late fetal death.

4 sets where both twins were late fetal deaths.

2 sets where one twin died in the postnatal period.

#### Triplets and Quadruplets

Fourteen sets of triplets were registered in 2009. Among these 42 babies, seven deaths occurred (5 early neonatal deaths and 2 late fetal deaths).

One set of quadruplets was registered in 2009. All four babies died in the early neonatal period.

**Table A23 Proportion of normally-formed singleton infants who are small for gestational age (SGA) by obstetric classification: 2009**

Obstetric classification	Antepartum stillbirth			Intrapartum stillbirth & neonatal death		
	Total	SGA	%	Total	SGA	%
<b>Total</b>	<b>238</b>	<b>56</b>	<b>23.5</b>	<b>106</b>	<b>5</b>	<b>4.7</b>
Hypertension of pregnancy	9	5	55.6	6	-	-
Antepartum haemorrhage	36	2	5.6	26	-	-
Unexplained	176	48	27.3	65	5	7.7
All other causes*	17	1	5.9	9	-	-

\* Includes trauma, maternal disorder and miscellaneous.

Source: Survey



**Table A24 Singleton, stillbirths and neonatal deaths;  
by obstetric classification, time of death and sex: 2009**

Obstetric classification	Stillbirths <sup>1, 3</sup>		Neonatal deaths <sup>2</sup>	
	Males	Females	Males	Females
<b>Total</b>	<b>146</b>	<b>146</b>	<b>83</b>	<b>50</b>
Congenital anomaly	21	18	25	18
Isoimmunisation	-	-	-	-
Hypertension of pregnancy	5	4	3	3
Antepartum haemorrhage	17	23	14	8
Trauma/mechanical	3	1	1	2
Maternal disorder	7	7	1	-
Miscellaneous	-	-	1	-
Unexplained <2500g	59	50	24	8
Unexplained ≥2500g	34	43	12	10
Postnatal cause only	-	-	2	1
	<b>Rates</b>			
<b>Total</b>	<b>5.0</b>	<b>5.2</b>	<b>2.8</b>	<b>1.8</b>
Congenital anomaly	0.7	0.6	0.9	0.6
Isoimmunisation	-	-	-	-
Hypertension of pregnancy	0.2	0.1	0.1	0.1
Antepartum haemorrhage	0.6	0.8	0.5	0.3
Trauma/mechanical	0.1	0.0	0.0	0.1
Maternal disorder	0.2	0.2	0.0	-
Miscellaneous	-	-	0.0	-
Unexplained <2500g	2.0	1.8	0.8	0.3
Unexplained ≥2500g	1.2	1.5	0.4	0.4
Postnatal cause only	-	-	0.1	0.0

1 Rate per 1000 singleton total births.

2 Rate per 1000 singleton live births.

3 Excludes 1 stillbirth where sex was unknown.

Source: Survey



**Table A25 Singleton late fetal deaths, therapeutic and spontaneous; by obstetric classification, comparison with stillbirths: 2009**

Cause	Late fetal deaths				Stillbirth	
	Therapeutic Number	%	Spontaneous Number	%	Number	%
<b>Total</b>	<b>41</b>	<b>100.0</b>	<b>83</b>	<b>100.0</b>	<b>293</b>	<b>100.0</b>
Congenital	35	85.4	-	-	39	13.3
Isoimmunisation	-	-	-	-	-	-
Pregnancy hypertension	-	-	-	-	9	3.1
Antepartum haemorrhage	*	*	17	20.5	40	13.7
Maternal disorder	*	*	5	6.0	14	4.8
Other	-	-	-	-	4	1.4
Unexplained	*	*	61	73.5	187	63.8

\* Indicates values that have been suppressed due to the potential risk of disclosure.

Source: SMR02 and Survey

**Table A26 Multiple late fetal deaths, therapeutic and spontaneous; by obstetric classification: 2009**

Cause	Late fetal deaths				Stillbirth	
	Therapeutic Number	%	Spontaneous Number	%	Number	%
<b>Total</b>	<b>-</b>	<b>-</b>	<b>12</b>	<b>100.0</b>	<b>24</b>	<b>100.0</b>
Congenital	-	-	-	-	10	41.7
Isoimmunisation	-	-	-	-	-	-
Pregnancy hypertension	-	-	-	-	-	-
Antepartum haemorrhage	-	-	*	*	1	4.2
Maternal disorder	-	-	-	-	-	-
Other	-	-	*	*	6	25.0
Unexplained	-	-	7	58.3	7	29.2

\* Indicates values that have been suppressed due to the potential risk of disclosure.

Source: SMR02 and Survey



**Table A27 Late fetal deaths notified to the Survey by birthweight and gestational age: 2009**

Gestational age (weeks)	All weights	Birthweight (g)											Not known
		<200	200-	300-	400-	500-	600-	700-	800-	900-	1000-	1100+	
<b>TOTAL</b>	<b>136</b>	<b>20</b>	<b>24</b>	<b>26</b>	<b>32</b>	<b>14</b>	<b>3</b>	<b>1</b>	-	-	<b>1</b>	-	<b>15</b>
<20	-	-	-	-	-	-	-	-	-	-	-	-	-
20	54	14	15	10	7	1	-	-	-	-	-	-	7
21	34	2	5	11	12	2	-	-	-	-	-	-	2
22	28	3	2	3	12	3	-	-	-	-	-	-	5
23	20	1	2	2	1	8	3	1	-	-	1	-	1

Source: SMR02 and Survey

**Table A28 Cause of post-neonatal death by age at death: 2009**

Cause of death	Age at death (months)				Total	
	1-2	3-5	6-8	9-11	Number	Percent
<b>Total</b>	<b>36</b>	<b>14</b>	<b>12</b>	<b>8</b>	<b>70</b>	-
<b>Percent</b>	<b>51.4</b>	<b>20.0</b>	<b>17.1</b>	<b>11.4</b>	-	<b>100.0</b>
Congenital anomaly	8	6	5	5	24	34.3
Perinatal causes						
Asphyxia related	-	-	-	-	-	0.0
Immaturity related	9	2	-	-	11	15.7
Infection	1	1	-	-	2	2.9
External causes	-	-	-	2	2	2.9
Sudden unexpected death in infancy	15	2	2	-	19	27.1
Miscellaneous						
Specific conditions	1	1	-	-	2	2.9
Remaining causes	2	2	5	1	10	14.3

Source: Survey



**Table A29 Post-neonatal mortality rates per 1000 live births by cause of death: 2003-2009**

Cause of death	2003	2004	2005	2006	2007	2008	2009
<b>All causes</b>	<b>1.66</b>	<b>1.85</b>	<b>1.73</b>	<b>1.49</b>	<b>1.45</b>	<b>1.42</b>	<b>1.19</b>
Congenital anomaly	0.42	0.57	0.55	0.34	0.33	0.60	0.41
Perinatal causes							
Asphyxia related	0.02	0.04	0.06	0.04	0.03	0.03	0.00
Immaturity related	0.29	0.43	0.42	0.38	0.36	0.27	0.19
Infection	0.15	0.17	0.17	0.16	0.16	0.08	0.03
External causes	0.04	0.09	0.04	0.05	0.05	0.03	0.03
Sudden unexpected death in infancy	0.71	0.46	0.37	0.45	0.43	0.23	0.32
Miscellaneous							
Specific conditions	0.02	0.09	0.09	0.07	0.07	0.07	0.03
Remaining causes	0.02	0.00	0.04	0.00	0.02	0.10	0.17

1 Rate per 1000 live births.

Source: Survey

**Table A30 Post-neonatal deaths by cause and place of death: 2009**

Cause of death	Place of death		
	Hospital	Other	Total
<b>All causes</b>	<b>57</b>	<b>13</b>	<b>70</b>
Congenital anomaly	21	3	24
Asphyxia related	-	-	-
Immaturity related	11	-	11
Infection	2	-	2
External causes	1	1	2
Sudden unexpected death in infancy	12	7	19
Specific conditions	2	-	2
Remaining causes	8	2	10

Source: Survey



**Table A31 Post-neonatal deaths by postmortem and cause of death: 2009**

Cause of death	Postmortem				
	Total	report received	report awaited	not performed	not known
<b>All causes</b>	<b>70</b>	<b>35</b>	<b>3</b>	<b>30</b>	<b>2</b>
Congenital anomaly	24	3	1	18	2
Asphyxia related	-	-	-	-	-
Immaturity related	11	3	-	8	-
Infection	2	-	-	2	-
External causes	2	1	-	1	-
Sudden unexpected death in infancy	19	18	1	-	-
Specific conditions	2	1	-	1	-
Remaining causes	10	9	1	-	-

Source: Survey



**Table A32 Singletons born in Scotland & detected<sup>1</sup> with congenital anomalies<sup>a</sup> at birth or during infancy<sup>2</sup>: 1999-2008**

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Neural tube defects	35	22	22	24	25	17	28	18	32	27
Anencephalus	4	2	1	6	3	3	4	2	2	5
Spina bifida +/- hydrocephalus	27	17	16	16	18	11	18	12	26	19
Encephalocele	5	3	5	2	4	4	6	5	4	3
Hydrocephalus	31	22	25	21	21	24	24	19	13	15
Anomalies of the heart & circulatory system	514	541	499	416	506	559	491	488	368	374
Heart	238	274	269	231	289	322	298	276	184	175
Circulatory system	233	221	213	212	209	262	243	233	164	161
Cleft palate	36	36	28	37	38	56	57	43	29	42
Cleft lip +/- cleft palate	41	43	38	37	45	43	51	38	32	41
Patau syndrome (trisomy 13)	7	8	3	6	7	6	4	3	6	3
Edwards syndrome (trisomy 18)	8	10	20	9	16	8	9	10	10	13
Down's syndrome (trisomy 21)	63	64	54	36	51	68	64	52	54	48

a See codes used for definition of congenital anomalies.

1 Anomalies have been located from the diagnostic summaries contained within the linked source data comprising profiles of neonatal and inpatient hospital discharge records, stillbirth notifications, Scottish birth record and death registrations.

2 All infants followed up from birth for period of one year to allow detection of anomalies from hospital inpatient records or General Register Office death registrations.

SPIMMR Congenital Anomaly	ICD-9 Codes	ICD-10 Codes
Neural tube defects	740, 741, 742.0	Q00, Q01, Q05, Q07.0
Anencephalus	740	Q00
Spina bifida +/- Hydrocephalus	741	Q05, Q07.0
Encephalocele	742.0	Q01
Hydrocephalus	742.3	Q03
Anomalies of the heart and circulatory system	745-747, 425.3; 394-411*; 414-417*; 424.0-425.2*; 425.4-426.9*	Q20-Q28, I42.4
Heart	745-746	Q20-Q24
Circulatory system	747	Q25-Q28
Cleft palate	749.0	Q35
Cleft lip +/- Cleft palate	749.1-749.2	Q36-Q37
Patau syndrome (trisomy 13)	758.1	Q91.4- Q91.7
Edwards syndrome (trisomy 18)	758.2	Q91.0-Q91.3
Down's syndrome (trisomy 21)	758.0	Q90

\* These codes are taken to be congenital anomalies if used on death certificates.

#### Notes

1 Anomalies have been located from the diagnostic summaries contained within the linked source data comprising profiles of neonatal and inpatient hospital discharge records, stillbirth notifications, Scottish birth record and death registrations.

2 All infants followed up from birth for period of one year to allow detection of anomalies from hospital inpatient records or General Register Office death registrations.

October 2006



**Table A33a Singletons born in Scotland & detected<sup>1</sup> with congenital anomalies<sup>a</sup> at birth or during infancy<sup>2</sup> rates per 1,000 births; by anomaly and year: 1999-2008**

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Neural tube defects	0.66	0.43	0.44	0.49	0.50	0.33	0.54	0.35	0.58	0.48
Anencephalus	0.08	0.04	0.02	0.12	0.06	0.06	0.08	0.04	0.04	0.09
Spina bifida +/- hydrocephalus	0.51	0.33	0.32	0.33	0.36	0.21	0.35	0.23	0.47	0.33
Encephalocele	0.09	0.06	0.10	0.04	0.08	0.08	0.12	0.10	0.07	0.05
Hydrocephalus	0.59	0.43	0.50	0.43	0.42	0.46	0.47	0.36	0.24	0.26
Anomalies of the heart & circulatory system	9.72	10.54	9.98	8.45	10.07	10.75	9.52	9.37	6.70	6.59
Heart	4.50	5.34	5.38	4.69	5.75	6.19	5.78	5.30	3.35	3.08
Circulatory system	4.41	4.31	4.26	4.31	4.16	5.04	4.71	4.48	2.99	2.84
Cleft palate	0.68	0.70	0.56	0.75	0.76	1.08	1.11	0.83	0.53	0.74
Cleft lip +/- cleft palate	0.78	0.84	0.76	0.75	0.90	0.83	0.99	0.73	0.58	0.72
Patau syndrome (trisomy 13)	0.13	0.16	0.06	0.12	0.14	0.12	0.08	0.06	0.11	0.05
Edwards syndrome (trisomy 18)	0.15	0.19	0.40	0.18	0.32	0.15	0.17	0.19	0.18	0.23
Down's syndrome (trisomy 21)	1.19	1.25	1.08	0.73	1.01	1.31	1.24	1.00	0.98	0.85

a See codes used for definition of congenital anomalies.

Source: GROS

1 Anomalies have been located from the diagnostic summaries contained within the linked source data comprising profiles of neonatal and inpatient hospital discharge records, stillbirth notifications, Scottish birth record and death registrations.

2 All infants followed up from birth for period of one year to allow detection of anomalies from hospital inpatient records or General Register Office death registrations.



**Table A33b Singletons born in Scotland & detected<sup>1</sup> with congenital anomalies<sup>a</sup> at birth, during infancy<sup>2</sup>, or aborted<sup>3</sup> because of prenatal diagnosis rates per 1,000 births: 1999-2008**

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Neural tube defects	1.23	0.92	0.84	1.24	0.99	0.87	1.01	0.85	1.11	0.90
Anencephalus	0.43	0.29	0.22	0.55	0.36	0.29	0.23	0.35	0.31	0.33
Spina bifida +/- hydrocephalus	0.66	0.53	0.46	0.55	0.54	0.42	0.56	0.42	0.67	0.46
Encephalocoele	0.15	0.10	0.16	0.14	0.10	0.17	0.21	0.10	0.13	0.11
Hydrocephalus	0.74	0.55	0.52	0.47	0.54	0.63	0.54	0.44	0.29	0.35
Anomalies of the heart & circulatory system	9.76	10.66	10.08	8.57	10.19	10.96	9.67	9.55	6.79	6.68
Heart	4.54	5.44	5.48	4.82	5.87	6.40	5.93	5.44	3.44	3.17
Circulatory system	4.41	4.33	4.26	4.31	4.16	5.04	4.71	4.51	2.99	2.84
Cleft palate	0.68	0.70	0.62	0.77	0.80	1.08	1.12	0.83	0.55	0.74
Cleft lip +/- cleft palate	0.78	0.84	0.76	0.75	0.90	0.83	0.99	0.73	0.58	0.72
Patau syndrome (trisomy 13)	0.15	0.25	0.10	0.18	0.22	0.21	0.14	0.17	0.20	0.16
Edwards syndrome (trisomy 18)	0.25	0.31	0.72	0.30	0.60	0.44	0.35	0.52	0.36	0.42
Down's syndrome (trisomy 21)	1.89	1.87	1.78	1.38	1.73	1.98	1.82	1.79	1.66	1.34

a See codes used for definition of congenital anomalies.

1 Anomalies have been located from the diagnostic summaries contained within the linked source data comprising profiles of neonatal and inpatient hospital discharge records, stillbirth notifications, Scottish birth record and death registrations.

2 All infants followed up from birth for period of one year to allow detection of anomalies from hospital inpatient records or General Register Office death registrations.

3 Refers to therapeutic abortions notified in accordance with the Abortion Act 1967.



**Table A34 Stillbirth mortality by NHS board of residence; numbers and rates<sup>1</sup>: 2003-2009<sup>2</sup>**

	2003		2004		2005		2006		2007		2008		2009	
	No	Rate	No	Rate	No	Rate	No	Rate	No	Rate	No	Rate	No	Rate
<b>Scotland</b>	<b>296</b>	<b>5.6</b>	<b>317</b>	<b>5.8</b>	<b>292</b>	<b>5.3</b>	<b>296</b>	<b>5.3</b>	<b>327</b>	<b>5.6</b>	<b>325</b>	<b>5.4</b>	<b>317</b>	<b>5.3</b>
Argyll & Clyde	29	7.0	42	9.5	27	6.2	21	4.9	-	-	-	-	-	-
Ayrshire & Arran	16	4.4	21	5.6	18	5.0	21	5.5	27	6.9	17	4.3	18	4.6
Borders	5	4.8	3	2.8	6	5.7	5	4.5	2	1.7	8	7.0	9	7.7
Dumfries & Galloway	7	5.3	3	2.1	7	5.0	3	2.0	6	4.0	7	4.9	8	5.3
Fife	23	6.3	13	3.5	21	5.5	24	6.0	23	5.6	30	6.9	23	5.5
Forth Valley	17	5.8	20	6.3	22	7.0	17	5.3	16	4.7	18	5.2	11	3.3
Grampian	24	4.6	25	4.7	24	4.4	31	5.4	32	5.2	31	4.9	29	4.5
Greater Glasgow & Clyde	62	6.5	71	7.4	61	6.2	60	6.2	94	6.8	80	5.6	76	5.4
Highland	6	2.9	11	5.0	8	3.6	10	4.6	17	5.5	14	4.2	23	7.2
Lanarkshire	45	7.4	35	5.4	33	5.2	38	5.7	32	4.9	36	5.2	44	6.6
Lothian	42	5.0	54	6.3	46	5.2	43	4.7	51	5.4	48	4.8	47	4.8
Orkney	1	5.8	2	11.6	-	-	1	4.7	-	-	3	13.8	2	10.0
Shetland	1	4.0	-	-	2	8.7	2	7.4	1	4.1	-	-	4	14.4
Tayside	17	4.3	16	4.1	15	3.7	19	4.7	25	5.9	33	7.4	23	5.2
Western Isles	1	3.9	1	4.5	2	8.5	1	3.6	1	3.8	-	-	-	-

<sup>1</sup> Rate per 1000 total births.

<sup>2</sup> NHS Argyll & Clyde was dissolved 31<sup>st</sup> March 2006 and the administration area was split into two sub-areas that now fall under NHS Greater Glasgow & Clyde and NHS Highland.

Source: GROS



**Table A35 Neonatal mortality by NHS board of residence; numbers and rates<sup>1</sup>: 2003-2009<sup>2</sup>**

	2003		2004		2005		2006		2007		2008		2009	
	No	Rate	No	Rate	No	Rate	No	Rate	No	Rate	No	Rate	No	Rate
<b>Scotland</b>	<b>178</b>	<b>3.4</b>	<b>166</b>	<b>3.1</b>	<b>190</b>	<b>3.5</b>	<b>172</b>	<b>3.1</b>	<b>188</b>	<b>3.3</b>	<b>168</b>	<b>2.8</b>	<b>165</b>	<b>2.8</b>
Argyll & Clyde	10	2.4	23	5.2	17	4.0	15	3.5	-	-	-	-	-	-
Ayrshire & Arran	13	3.6	8	2.2	14	3.9	10	2.6	21	5.4	15	3.8	12	3.1
Borders	5	4.8	3	2.9	3	2.9	1	0.9	2	1.7	2	1.8	3	2.6
Dumfries & Galloway	2	1.5	-	-	1	0.7	5	3.4	6	4.0	5	3.5	3	2.0
Fife	13	3.6	18	4.8	12	3.1	17	4.3	20	4.9	20	4.6	19	4.6
Forth Valley	9	3.1	8	2.5	12	3.8	4	1.2	7	2.1	12	3.5	10	3.0
Grampian	23	4.4	20	3.8	15	2.8	22	3.9	13	2.1	11	1.7	17	2.6
Greater Glasgow & Clyde	27	2.9	38	4.0	31	3.2	19	2.0	47	3.4	51	3.6	37	2.6
Highland	3	1.4	2	0.9	9	4.0	5	2.3	6	2.0	3	0.9	9	2.8
Lanarkshire	34	5.6	11	1.7	23	3.7	24	3.6	17	2.6	11	1.6	11	1.7
Lothian	21	2.5	22	2.6	37	4.2	36	4.0	30	3.2	26	2.6	27	2.8
Orkney	-	-	-	-	-	-	-	-	1	5.3	0	0.0	-	-
Shetland	3	12.0	3	13.0	-	-	1	3.7	2	8.2	4	14.4	-	-
Tayside	15	3.8	9	2.3	15	3.8	10	2.5	15	3.6	8	1.8	17	3.9
Western Isles	-	-	1	4.5	1	4.3	3	10.9	1	3.8	0	0.0	-	-

<sup>1</sup> Rate per 1000 live births.

<sup>2</sup> NHS Argyll & Clyde was dissolved 31<sup>st</sup> March 2006 and the administration area was split into two sub-areas that now fall under NHS Greater Glasgow & Clyde and NHS Highland.



**Table A36 FIGO classification stillbirth and neonatal deaths by NHS Board of residence: 2009**

NHS board of residence	Stillbirths		Neonatal deaths	
	Weighing 500g and over	Weighing 1000g and over normally-formed	Weighing 500g and over	Weighing 1000g and over normally-formed
<b>Numbers</b>				
<b>Scotland</b>	<b>279</b>	<b>188</b>	<b>139</b>	<b>55</b>
Ayrshire & Arran	17	11	10	4
Borders	8	5	3	2
Dumfries & Galloway	6	4	2	1
Fife	19	13	12	6
Forth Valley	9	7	10	3
Grampian	26	18	14	1
Greater Glasgow & Clyde	64	41	33	12
Highland	23	17	8	4
Lanarkshire	34	24	10	4
Lothian	42	27	19	12
Orkney	2	1	-	-
Shetland	4	2	-	-
Tayside	23	16	18	6
Western Isles	-	-	-	-
Outwith Scotland	2	2	-	-
<b>Rates<sup>1</sup></b>				
<b>Scotland</b>	<b>4.7</b>	<b>3.2</b>	<b>2.4</b>	<b>0.9</b>
Ayrshire & Arran	4.3	2.8	2.6	1.0
Borders	6.9	4.3	2.6	1.7
Dumfries & Galloway	4.0	2.6	1.3	0.7
Fife	4.6	3.1	2.9	1.5
Forth Valley	2.7	2.1	3.0	0.9
Grampian	4.0	2.8	2.2	0.2
Greater Glasgow & Clyde	4.5	2.9	2.4	0.9
Highland	7.2	5.3	2.5	1.3
Lanarkshire	5.1	3.6	1.5	0.6
Lothian	4.3	2.8	2.0	1.2
Orkney	10.0	5.0	-	-
Shetland	14.4	7.2	-	-
Tayside	5.2	3.7	4.1	1.4
Western Isles	-	-	-	-

<sup>1</sup> Stillbirths per 1000 total births, neonatal deaths per 1000 live births.

Source: Survey



**Table A37a Pregnancy losses from 20 weeks gestation to end of first year: 2009**

NHS board of residence	Late fetal deaths	Live births	Stillbirths	Early neonatal deaths	Late neonatal deaths	Neonatal deaths	Post-neonatal deaths	Infant deaths
<b>Numbers</b>								
<b>Scotland</b>	<b>136</b>	<b>59046</b>	<b>317</b>	<b>120</b>	<b>45</b>	<b>165</b>	<b>70</b>	<b>235</b>
Ayrshire & Arran	13	3914	18	8	4	12	6	18
Borders	-	1157	9	2	1	3	-	3
Dumfries & Galloway	11	1507	8	3	-	3	2	5
Fife	9	4135	23	14	5	19	5	24
Forth Valley	12	3345	11	6	4	10	4	14
Grampian	28	6433	29	12	5	17	4	21
Greater Glasgow & Clyde	37	14015	76	24	13	37	18	55
Highland	3	3189	23	8	1	9	3	12
Lanarkshire	15	6575	44	7	4	11	9	20
Lothian	1	9719	47	21	6	27	6	33
Orkney	-	199	2	-	-	-	1	1
Shetland	-	273	4	-	-	-	-	-
Tayside	7	4358	23	15	2	17	12	29
Western Isles	-	227	-	-	-	-	-	-
Outside Scotland	-	-	-	-	-	-	-	-



**Table A37b Pregnancy losses from 20 weeks gestation to end of first year: 2009**

NHS board of residence	Late fetal deaths <sup>1</sup>	Stillbirths <sup>2</sup>	Perinatal <sup>2</sup>	Neonatal <sup>3</sup>	Post-neonatal <sup>3</sup>	Infant <sup>3</sup>	Extended <sup>1</sup> (20 weeks-1yr) ('total loss')
<b>Rates</b>							
<b>Scotland</b>	<b>2.3</b>	<b>5.3</b>	<b>7.4</b>	<b>2.8</b>	<b>1.2</b>	<b>4.0</b>	<b>11.6</b>
Ayrshire & Arran	3.3	4.6	6.6	3.1	1.5	4.6	12.4
Borders	-	7.7	9.4	2.6	-	2.6	10.3
Dumfries & Galloway	7.2	5.3	7.3	2.0	1.3	3.3	15.7
Fife	2.2	5.5	8.9	4.6	1.2	5.8	13.4
Forth Valley	3.6	3.3	5.1	3.0	1.2	4.2	11.0
Grampian	4.3	4.5	6.3	2.6	0.6	3.3	12.0
Greater Glasgow & Clyde	2.6	5.4	7.1	2.6	1.3	3.9	11.9
Highland	0.9	7.2	9.7	2.8	0.9	3.8	11.8
Lanarkshire	2.3	6.6	7.7	1.7	1.4	3.0	11.9
Lothian	0.1	4.8	7.0	2.8	0.6	3.4	8.3
Orkney	-	10.0	10.0	-	5.0	5.0	14.9
Shetland	-	14.4	14.4	-	-	-	14.4
Tayside	1.6	5.2	8.7	3.9	2.8	6.7	13.4
Western Isles	-	-	-	-	-	-	-

1 Rate per 1000 total births + late fetal deaths.

2 Rate per 1000 total births.

3 Rate per 1000 live births.

Source: GROS, SMR02 and Survey



**Table A38 Multiple late fetal deaths, stillbirths and neonatal deaths;  
by NHS board of residence and time of death: 2009**

NHS board of residence	Live births	Late fetal deaths	Stillbirths	END	LND	Stillbirth Rate <sup>1</sup>	NND Rate <sup>2</sup>
<b>Scotland</b>	<b>1868</b>	<b>12</b>	<b>24</b>	<b>22</b>	<b>10</b>	<b>12.7</b>	<b>17.1</b>
Ayrshire & Arran	113	-	1	2	2	8.8	35.4
Borders	34	-	2	-	1	55.6	29.4
Dumfries & Galloway	50	-	-	2	-	-	40.0
Fife	139	2	2	6	-	14.2	43.2
Forth Valley	152	4	1	-	2	6.5	13.2
Grampian	182	-	1	5	-	5.5	27.5
Greater Glasgow & Clyde	391	5	7	3	3	17.6	15.3
Highland	87	1	-	-	-	-	-
Lanarkshire	197	-	2	1	1	10.1	10.2
Lothian	331	-	5	1	-	14.9	3.0
Orkney	8	-	-	-	-	-	-
Shetland	16	-	2	-	-	111.1	-
Tayside	158	-	1	1	1	6.3	12.7
Western Isles	10	-	-	-	-	-	-
Outwith	-	-	-	1	-	-	-

1 Rate per 1000 multiple total births.

2 Rate per 1000 multiple live births.

Source: GROS, SMR02 and Survey



**Table A39 Wigglesworth classification - stillbirth and neonatal deaths: 2009 by NHS board of residence**

NHS board of residence	Congenital	Antepartum stillbirths	Asphyxia	Immaturity	Specific causes	Not known
	<b>Numbers</b>					
<b>Scotland</b>	<b>94</b>	<b>207</b>	<b>89</b>	<b>50</b>	<b>37</b>	<b>5</b>
Ayrshire & Arran	6	11	6	*	3	-
Borders	-	8	*	*	1	-
Dumfries & Galloway	*	*	*	*	3	-
Fife	11	18	*	8	1	1
Forth Valley	*	6	6	6	1	-
Grampian	12	19	*	9	1	1
Greater Glasgow & Clyde	23	51	18	7	10	1
Highland	6	15	8	*	3	-
Lanarkshire	11	22	14	*	5	-
Lothian	10	33	18	7	4	1
Orkney	-	*	-	-	-	-
Shetland	-	*	-	-	2	-
Tayside	11	14	8	*	3	1
Western Isles	-	-	-	-	-	-
Outwith Scotland	*	*	*	-	-	-
	<b>Rates<sup>1</sup></b>					
<b>Scotland</b>	<b>1.6</b>	<b>3.5</b>	<b>1.5</b>	<b>0.8</b>	<b>0.6</b>	<b>0.1</b>
Ayrshire & Arran	1.5	2.8	1.5	*	0.8	-
Borders	-	6.9	*	*	0.9	-
Dumfries & Galloway	*	*	*	*	2.0	-
Fife	2.6	4.3	*	1.9	0.2	0.2
Forth Valley	*	0.9	1.8	1.8	0.3	-
Grampian	0.9	1.3	*	1.4	0.2	0.2
Greater Glasgow & Clyde	7.2	15.9	1.3	0.5	0.7	0.1
Highland	0.9	2.3	2.5	*	0.9	-
Lanarkshire	1.1	2.3	2.1	*	0.8	-
Lothian	1.0	3.4	1.8	0.7	0.4	0.1
Orkney	-	*	-	-	-	-
Shetland	-	*	-	-	7.2	-
Tayside	2.5	3.2	1.8	*	0.7	0.2
Western Isles	-	-	-	-	-	-

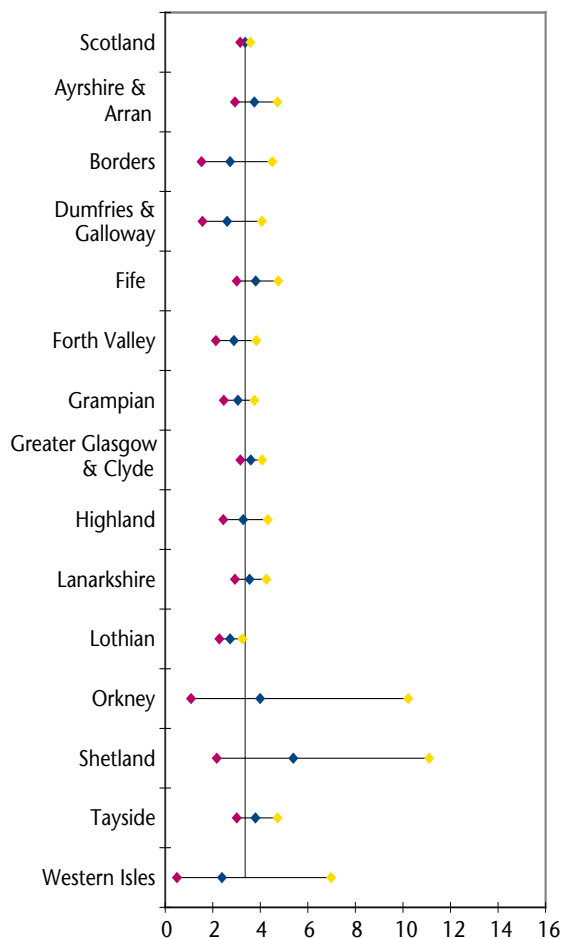
1 Rate per 1000 total births.

Source: Survey

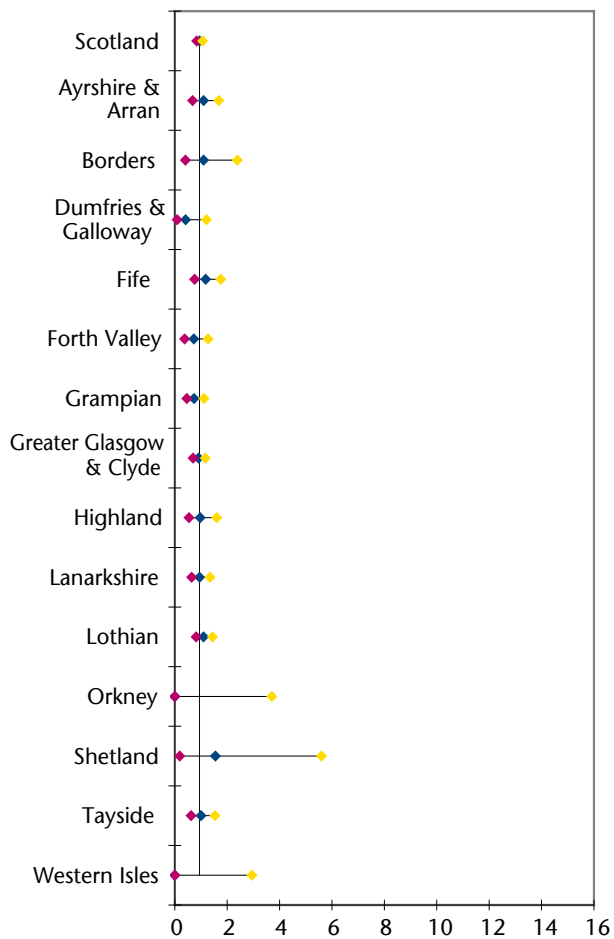


A40

**a** FIGO classification stillbirth rates (normally-formed  $\geq 1000g$ ) with 95% CI 2005-2009



**b** FIGO classification neonatal death rates (normally-formed  $\geq 1000g$ ) with 95% CI 2005-2009

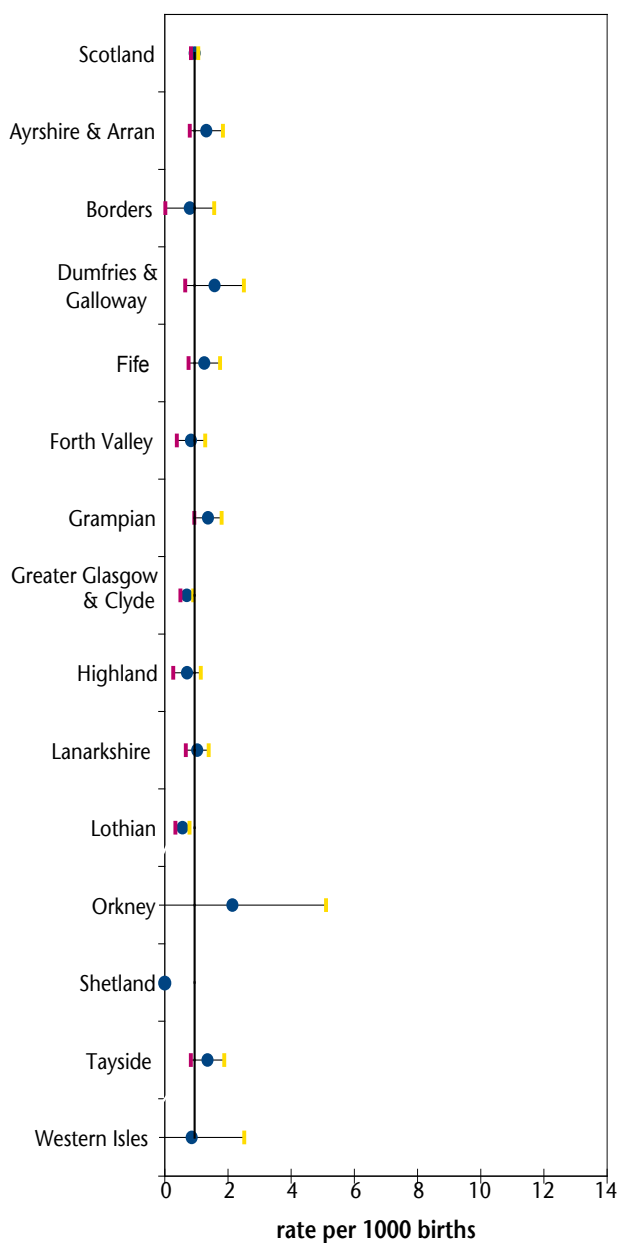


Source: GROS

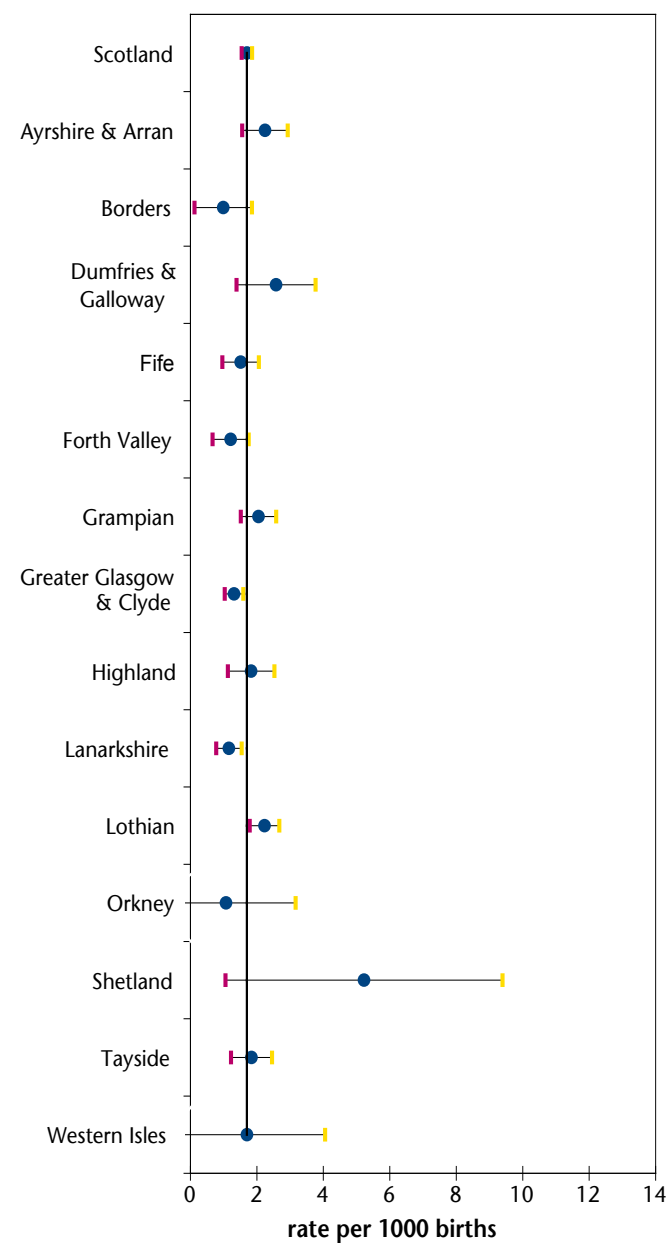


**A41**      **Singletons born in Scotland & detected<sup>1</sup> with congenital anomalies at birth, during infancy<sup>2</sup>, or aborted<sup>3</sup> rates per 1000 births; by NHS board of residence: 2004-2008**

**a** Neural tube defects by NHS board of residence; with 95% CI: 2004-2008

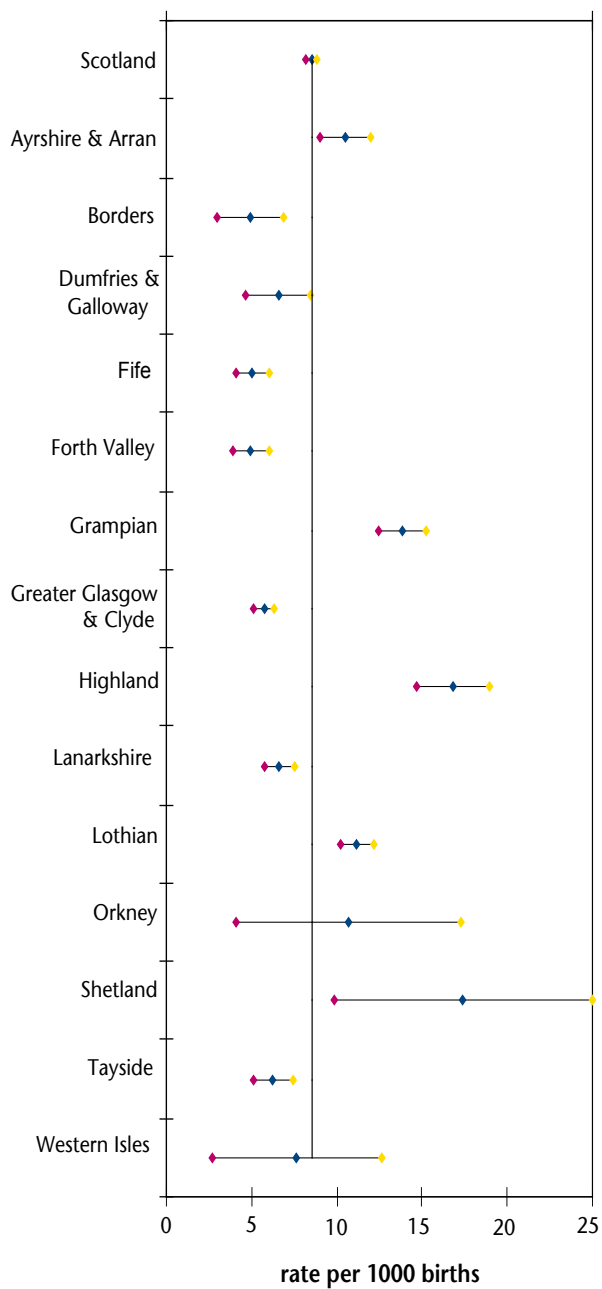


**b** Down's syndrome by NHS board of residence; with 95% CI: 2004-2008





**C Heart and circulatory system by NHS board of residence; with 95% confidence intervals 2004-2008**





**Table A42a Singletons born in Scotland & detected<sup>1</sup> with congenital anomalies<sup>a</sup> at birth or during infancy<sup>2</sup> rates per 1,000 births; by NHS board of residence: 2004-2008**

	Neural tube defects	Cleft palate	Cleft lip +/- cleft palate	Heart & circulatory system	Patau syndrome (trisomy 13)	Edwards syndrome (trisomy 18)	Down's syndrome (trisomy 21)
<b>Scotland</b>	<b>0.45</b>	<b>0.84</b>	<b>0.76</b>	<b>8.36</b>	<b>0.08</b>	<b>0.18</b>	<b>1.06</b>
Ayrshire & Arran	0.71	0.55	0.77	10.45	0.16	0.33	1.37
Borders	0.00	0.79	0.59	4.73	0.00	0.39	0.79
Dumfries & Galloway	0.86	0.86	0.72	6.58	0.43	0.14	1.29
Fife	0.42	0.68	0.42	4.73	0.16	0.21	0.68
Forth Valley	0.57	1.08	1.27	4.97	0.13	0.19	1.08
Grampian	0.47	0.86	0.79	13.46	0.07	0.29	0.90
Greater Glasgow & Clyde	0.52	0.93	0.66	5.71	0.09	0.20	1.02
Highland	0.21	0.63	1.33	16.77	0.07	0.21	1.33
Lanarkshire	0.66	0.63	0.43	6.58	0.03	0.13	0.89
Lothian	0.28	0.95	0.95	11.10	0.02	0.09	1.44
Orkney	0.00	1.07	2.14	9.63	0.00	0.00	0.00
Shetland	0.00	0.87	0.87	17.41	0.00	0.00	1.74
Tayside	0.16	0.86	0.70	5.78	0.00	0.05	0.70
Western Isles	0.00	3.40	0.00	7.65	0.00	0.00	0.85

a See codes used for definition of congenital anomalies.

1 Anomalies have been located from the diagnostic summaries contained within the linked source data comprising profiles of neonatal and inpatient hospital discharge records, stillbirth notifications, Scottish birth record and death registrations.

2 All infants followed up from birth for period of one year to allow detection of anomalies from hospital inpatient records or General Register Office death registrations.

Excludes cases where NHS board of residence could not be assigned.



**Table A42b Singletons born in Scotland & detected<sup>1</sup> with congenital anomalies<sup>a</sup> at birth, during infancy<sup>2</sup>, or aborted<sup>3</sup> because of prenatal diagnosis rates per 1,000 births; by NHS board of residence: 2004-2008**

	Neural tube defects	Cleft palate	Cleft lip +/- cleft palate	Heart & circulatory system	Patau syndrome (trisomy 13)	Edwards syndrome (trisomy 18)	Down's syndrome (trisomy 21)
<b>Scotland</b>	<b>0.94</b>	<b>0.85</b>	<b>0.76</b>	<b>8.51</b>	<b>0.18</b>	<b>0.42</b>	<b>1.70</b>
Ayrshire & Arran	1.31	0.55	0.77	10.50	0.27	0.49	2.24
Borders	0.79	0.79	0.59	4.93	0.20	0.59	0.99
Dumfries & Galloway	1.57	0.86	0.72	6.58	0.72	0.57	2.57
Fife	1.25	0.68	0.42	5.05	0.26	0.36	1.51
Forth Valley	0.83	1.08	1.27	4.97	0.13	0.25	1.21
Grampian	1.36	0.90	0.79	13.86	0.22	0.65	2.05
Greater Glasgow & Clyde	0.69	0.93	0.66	5.74	0.14	0.29	1.31
Highland	0.70	0.63	1.33	16.84	0.07	0.42	1.82
Lanarkshire	1.02	0.63	0.43	6.64	0.03	0.36	1.16
Lothian	0.56	0.97	0.95	11.19	0.23	0.46	2.23
Orkney	2.14	1.07	2.14	10.70	0.00	0.00	1.07
Shetland	0.00	0.87	0.87	17.41	0.00	0.87	5.22
Tayside	1.35	0.86	0.70	6.27	0.11	0.49	1.84
Western Isles	0.85	3.40	0.00	7.65	0.00	0.00	1.70

a See codes used for definition of congenital anomalies.

1 Anomalies have been located from the diagnostic summaries contained within the linked source data comprising profiles of neonatal and inpatient hospital discharge records, stillbirth notifications, Scottish birth record and death registrations.

2 All infants followed up from birth for period of one year to allow detection of anomalies from hospital inpatient records or General Register Office death registrations.

Excludes cases where NHS board of residence could not be assigned.

3 Refers to therapeutic abortions notified in accordance with the Abortion Act 1967.



## 10.2 Acknowledgements

The Scottish Stillbirth and Infant Death Survey (SSIBDS) is administered by the Reproductive Health Programme of NHS Quality Improvement Scotland (NHS QIS), working in partnership with Information Services of NHS National Services Scotland (ISD). Particular acknowledgement is made to Kenny Gifford, Chris Lennox and Leslie Marr of NHS QIS and to Samantha Clarke, Carole Morris and Etta Shanks of ISD. The process is overseen by the Scottish Perinatal and Infant Mortality and Morbidity Review Advisory Group (SPMMRAG), chaired by Dr Margaret Evans. The advisory group membership is listed below.

Thanks are also due to the clinical co-ordinators, midwifery, neonatal, pathology and secretarial staff who complete the SSBID Survey forms throughout Scotland. We also thank the staff of the General Register Office for Scotland who provide the basic data on births and deaths essential for the conduct of the Survey.

The full SPIMMR is available only as a Web Edition within Scottish Health Statistics, the ISD website ([www.isdscotland.org/spimmr](http://www.isdscotland.org/spimmr)) and via a link on the NHS QIS website ([www.nhshealthquality.org](http://www.nhshealthquality.org)). A summary of the report is distributed widely among reproductive health professionals in Scotland via the newsletter of the NHS QIS Reproductive Health Programme.

### Members of SPMMRAG 2009/2010

Ruth Batten	Scottish Neonatal Nurses Group	
Sandra Bonnellie	Statistician, Napier University	
Catherine Calderwood	Scottish Government, (ex officio)	
Jim Chalmers	Information Services Division, (ex officio)	
Margaret Evans	Pathology	Chair
Kenny Gifford	Administrator, (ex officio)	
Mairi Harvey	Public Partner, NHS QIS	
Chris Lennox	Reproductive Health Programme, NHS QIS, (ex officio)	Clinical Advisor
Leslie Marr	Reproductive Health Programme, NHS QIS, (ex officio)	Co-ordinator
Morag Martindale	Royal College of General Practitioners	
Dina McLellan	Royal College of Obstetricians and Gynaecologists	
Gillian Smith	Royal College of Midwives	

### Information Services Division Support Team

Samantha Clarke  
Kirsten Monteath  
Carole Morris  
Alistair Philp  
Etta Shanks



### 10.3 Hospital Co-ordinators 2009

NHS board	Hospitals	Co-ordinators
Ayrshire & Arran	Ayrshire Central Hospital	Dr G Dobbie
		Ms C Freckleton
		Ms J Gladwinfield
Borders Dumfries & Galloway	Borders General Hospital Cresswell Maternity Hospital	Ms M Hogg
		Dr B Magowan
		Dr R Grieve
Fife	Forth Park Hospital	Ms A Torrance
		Dr G Tydeman
		Ms M Telford
Forth Valley	Stirling Royal Infirmary	Dr U McFadyen
		Dr J Steven
		Ms M Paterson
Grampian	Aberdeen Maternity Hospital and assoc. hospitals and Orkney and Shetland Hospitals	Ms F Sinclair
		Dr P Danielian
		Dr C Hauptfleisch
Greater Glasgow & Clyde	Dr Gray's Hospital Princess Royal Maternity Hospital	Ms V Anderson
		Ms G Clark
		Dr N Maclean
	Southern General Hospital	Dr A Mathers
		Dr P Owen
		Mrs L Wright
	Queen Mother's Hospital	Dr V Hood
		Dr M White
		Ms C Gaughan
	Royal Hospital for Sick Children Royal Alexandra Hospital	Ms S Bonner
		Dr A Cameron
		Dr B Holland
Highland	Raigmore Hospital and assoc. hospitals	Ms B Montgomery
		Ms C Morahan
		Dr T Turner
	Caithness General Hospital	Dr G Stewart
		Dr A Quinn
		Dr D Herd
Lanarkshire	Wishaw Hospital	Dr I MacDonald
		Ms J Smith
		Ms A Brown
Lothian	Royal Infirmary of Edinburgh	Ms L Hamilton
		Dr P Boabang
		Ms G Morgan
	Royal Hospital for Sick Children	Dr S Cooper
		Dr S Cowan
		Dr C Love
	St John's Hospital	Ms D Grooby
		Ms G Mitchell
		Dr D Brown
Tayside	Ninewells Hospital and Perth Royal Infirmary	Dr J Burns
		Ms S Wurr
		Dr S Court
	Western Isles Hospital	Dr K McKintosh
		Ms C Lyle
		Prof G Mires
Western Isles	Western Isles Hospital	Dr P Fowlie
		Dr W Coleman
		Ms H Clark
		Ms B Peters
		Ms A Hodgart
		Ms K MacLeod



## 10.4 Conventions

The following symbols and abbreviations have been used:

..	not available
-	nil
0.0	negligible
AP	Antepartum
APH	Antepartum haemorrhage
GROS	General Register Office (Scotland)
IP	Intrapartum
IUD	Intrauterine death
SUDI	Sudden unexpected death in infancy
SB	Stillbirth
NND	Neonatal death
END	Early neonatal death
LND	Late neonatal death
PNND	Post-neonatal death
LFD	Late fetal death
CNS	Central nervous system
CVS	Cardiovascular system
HMD	Hyaline membrane disease
IVH	Intraventricular haemorrhage
SGA	Small for gestational age



## 10.5 Definitions

**Stillbirths** Section 56(1) of the Registration of Births, Deaths and Marriages (Scotland) Act 1965 defined a stillbirth as a child which had issued forth from its mother after the 28th week of pregnancy and which did not breathe or show any other sign of life. The Still-Birth (Definition) Act 1992, which came into effect on 1 October 1992, amended Section 56(1) of the 1965 Act (and other relevant UK legislation), replacing the reference to the 28th week with a reference to the 24th week.

**Perinatal deaths** refer to stillbirths and deaths in the first week of life.

**Neonatal deaths** refer to deaths in the first four weeks of life.

**Early neonatal deaths** refer to deaths in the first week of life.

**Late neonatal deaths** refer to deaths in weeks two to four of life.

**Post-neonatal deaths** refer to deaths after the first four weeks but before the end of the first year.

**Infant deaths** refer to all deaths in the first year of life.

**Late fetal deaths** refer to infants born dead at 20-23 weeks of pregnancy or earlier in pregnancy if the birthweight is 500g or more.

## Rates

**Stillbirth and perinatal death rates** are based on the total of live and stillbirths.

**Neonatal, post-neonatal and infant death rates** are based on live births only.

**Late fetal death rates** are based on the total of live and stillbirths and late fetal deaths.



## 10.6 Denominators

### ISD - figures

#### Table Numbers

2,3	Singleton				
	Total Births	Live births			
	57471	59046			
A10,A11	Multiple				
	1892	1868			
A20a,A21a	Singleton				
		denominator	numerator	denominator	numerator
	Total	Total Births	NF SB <sup>1</sup>	Live births	NF NND <sup>2</sup>
	57391	254	57138	90	
	Under 1500	525	97	415	48
	1500-2499	2545	52	2488	6
	2500-3499	27908	73	27842	17
	3500-4499	25002	29	24984	16
	4500+	1345	2	1344	-
	nk	66	1	65	3
A20b,A21b	Singleton				
		denominator	numerator	denominator	numerator
	Total	Total Births	NF SB <sup>1</sup>	Live births	NF NND <sup>2</sup>
	57390	254	57137	90	
	<24	39	-	12	15
	24-27	194	58	122	26
	28-31	404	36	352	9
	32-36	2831	61	2842	6
	37+	53869	99	53768	32
	nk	53	-	41	2

### GRO(S) - figures

#### Table Numbers

A24	Singleton				
	Male		Female		
	Total Births	Live births	Total Births	Live births	
	29424	29277	28048	27902	
A34-A37			Total Births	Live births	Total births
A39					+ Late Fetal Deaths
	Scotland		59363	59046	59499
	Ayrshire & Arran		3932	3914	3945
	Borders		1166	1157	1166
	Dumfries & Galloway		1515	1507	1526
	Fife		4158	4135	4167
	Forth Valley		3356	3345	3368
	Grampian		6462	6433	6490
	Greater Glasgow & Clyde		14091	14015	14128
	Highland		3212	3189	3215
	Lanarkshire		6619	6575	6634
	Lothian		9766	9719	9767
	Orkney		201	199	201
	Shetland		277	273	277
	Tayside		4381	4358	4388
	Western Isles		227	227	227

1 Normally-formed stillbirths.



<sup>2</sup> Normally-formed neonatal deaths.

## **10.7 National Statistics**

Unless otherwise specified in the 'Data Sources' section, the figures contained in this publication are 'National Statistics'.

National Statistics are produced to high professional standards, and adhere to commitments relating to integrity, confidentiality, burden of collection, liaison and consultation, openness, access and timeliness. National Statistics undergo regular quality assurance reviews to ensure that they meet customer needs, and they are produced free from political interference.

National Statistics releases are grouped under one of 13 broad subject headings (themes); this belongs to the Health and Care theme.

Further details on National Statistics are contained at the National Statistics website (<http://www.statistics.gov.uk/>).



## 10.8 Details of Method

### Sources of data

GROS provided information on all stillbirths and all infant deaths occurring up to the end of the first year of life registered in 2009 and the numbers of live births registered in 2009.

SMR02 provided information on discharges from maternity hospitals in 2009.

SSBIDS collected additional information on stillbirths, neonatal deaths and late fetal deaths for 2009.

**Congenital Anomalies:** Data on congenital anomalies were obtained from neonatal returns (SMR11) up to 2003 and the Scottish Birth Record (SBR) from 2003, from the Stillbirth & Infant Death Survey and from returns relating to hospital admissions in the first year of life (SMR01).

**Stillbirths and neonatal deaths:** After receiving death registration data from GROS, a data collection form (Appendix 10.10) was sent from the NHS QIS administrative office to a local clinical co-ordinator in the hospital of birth for completion. Copies of relevant case summaries, postmortem reports, discharge letters and Perinatal Mortality Meeting reports were requested and sent to NHS QIS for initial processing and forwarding to ISD. Postmortem reports may also be sent directly to NHS QIS from pathology departments. This additional information was not available in all cases and for 7% of registered deaths in 2009, only the GROS certificate and some additional information from SMR02 data was available.

**Late fetal deaths:** are not registered by GROS but SMR02 provides information on a proportion of cases. Co-ordinators were asked to complete forms for them, and for any other late fetal deaths known to them, in the same way as for stillbirths and neonatal deaths.

**Post-neonatal deaths:** Survey forms are not completed for these deaths and the only information available for them comes from the GROS death certificate and SMR02.

Local co-ordinators are obstetricians, paediatricians, midwives and supporting secretarial staff (listed in Appendix 10.3). The Survey could not continue without their help and co-operation.

### How complete is the information?

The provision of information on all registered stillbirths and infant deaths by the General Register Office for Scotland means that the information on the number of these cases is complete. The number of unregistered stillbirths and infant deaths is likely to be extremely small. Notification of late fetal deaths is less certain. SMR02 records from maternity units are very helpful but some cases may occur in other units. Thus the numbers of late fetal deaths are likely to be less than complete.



## Diagnostic classification and coding

Each case of stillbirth or neonatal death was classified twice:

- first, for the main obstetric factor leading to the death
- second, for the pathology in the infant causing the death

This double classification uses the Scottish Obstetric and Paediatric classification<sup>4,5</sup> last modified in 1987.

The NHS QIS Clinical Advisor assigned the diagnostic classifications using the clinical information provided by local co-ordinators and pathologists. Consistency in the diagnostic categorisation is ensured as all cases were classified by a single individual. The accuracy of the classification depends on the amount of information available and this may be variable, as described above.

Post-neonatal deaths were classified by the NHS QIS Clinical Advisor into one of eight categories based on information available from the death certificate and SMR02 only (no survey forms are completed for these deaths). The classification used is that devised by the International Collaborative Effort (ICE) in 1989<sup>7</sup>.



## 10.9 Classification

Categories at the head of the list take priority over those lower down

### Obstetric classification

Code	Category
(1-7)	<b>Congenital Anomaly:</b> Any structural or genetic defect incompatible with life or potentially treatable but causing death
1	Central nervous system
2	Cardiovascular system
3	Renal
4	Alimentary (excludes diaphragmatic hernia)
5	Chromosomal
6	Biochemical
7	Other (including other and musculoskeletal)
(8-9)	<b>Isoimmunisation:</b> Death ascribable to blood group incompatibility
8	Rhesus incompatibility
9	Non-rhesus incompatibility
(10-11)	<b>Toxaemia:</b> In deaths with Antepartum haemorrhage (APH) secondary to toxaemia, classify toxaemia first and APH second
10	Severe - diastolic of 110mm Hg or more on two or more occasions after 20 weeks with proteinuria of 300 mg/24 hours or more
11	Other toxaemia
(12-14)	<b>Antepartum Haemorrhage</b> (see note above on Toxaemia)
12	Abruptio placentae
13	Placenta praevia
14	Other APH (with evidence of recurrent bleeding after the first trimester)
(15-17)	<b>Mechanical:</b> Any death from uterine rupture, cord compression, birth trauma or intrapartum asphyxia that is associated with disproportion, malpresentation or breech delivery of babies 1000g or more. Deaths from anoxia or cerebral trauma should be classified as Unexplained (codes 24-27) if there is no evidence of difficulty in labour. Antepartum deaths associated with cord entanglement in the absence of strong circumstantial evidence that cord compression caused death (eg fetal death soon after external version) should be classified to Unexplained (codes 24-27)
15	Breech
16	Cord prolapse
17	Other mechanical
(18-22)	<b>Maternal Disorder</b>
18	Maternal trauma
19	Essential hypertension
20	Diabetes
21	Abdominal operations in pregnancy
22	Other (including maternal infection)
(23)	<b>Miscellaneous</b>
23	(Specify) -
(24-27)	<b>Unexplained</b>
24	Birthweight <2500g before 37 weeks
25	Birthweight <2500g at 37 weeks or over
26	Birthweight 2500g or over before 37 weeks
27	Birthweight 2500g or over at 37 weeks or over
(28)	<b>Postnatal Cause Only</b>

Revised 1.1.87

### Paediatric classification

Code	Category
(1-7)	<b>Congenital Anomaly:</b> (see Obstetric classification)
1	Central nervous system
2	Cardiovascular system
3	Renal
4	Alimentary (excludes diaphragmatic hernia)
5	Chromosomal
6	Biochemical
7	Other (including multiple and musculoskeletal)
8	Rhesus incompatibility
9	Non-rhesus incompatibility
(10-11)	<b>Intrauterine Anoxia</b>
10	Antepartum
11	Intrapartum
(12)	<b>Birth Trauma</b> (eg serious damage to falx, great cerebral vein, cervical spine, rupture of liver or avulsion of spleen in the absence of clinical or postmortem evidence of severe fetal anoxia)
12	(Specify) -
(13)	<b>Lung Immaturity &lt; 27 weeks</b>
13	Structural lung immaturity sufficient to render ventilation impossible
(14-15)	<b>Hyaline Membrane Disease (HMD)</b>
14	HMD with significant intraventricular haemorrhage (IVH) (grade III or IV)
15	HMD without significant IVH
(16-20)	<b>Intracranial Haemorrhage</b>
16	IVH (in the absence of potentially lethal HMD)
17	IVH (in a baby who never had HMD)
18	Subarachnoid haemorrhage
19	Subdural haemorrhage
20	Intracerebral haemorrhage
(21-24)	<b>Infection</b>
21	Necrotising enterocolitis (NEC) ) with or without disseminated
22	Antenatal ) intravascular
23	Intranatal ) coagulation or
24	Other postnatal infection ) pulmonary haemorrhage
(25-27)	<b>Haemorrhage (other than Intracranial)</b>
25	Disseminated intravascular coagulation ) in the
26	Pulmonary - massive intra-alveolar ) absence of
27	Other haemorrhage ) infection
(28)	<b>Other Paediatric Factors</b> ( eg persistent fetal circulation, massive aspiration syndrome, non-immune, non-rhesus hydrops)
28	(Specify) -
(29)	<b>Unexplained</b> (eg found dead or Sudden Infant Death Syndrome)
29	(Specify) -



## 10.10 Enquiry Form 2009

### Reproductive Health Programme, NHS Quality Improvement Scotland Scottish Stillbirth and Infant Death Survey Form

Revised April 2008

For ISD Use Only

#### DETAILS OF MOTHER

Name \_\_\_\_\_

Address \_\_\_\_\_

Hospital Unit Number \_\_\_\_\_

Date of Birth \_\_\_\_ / \_\_\_\_ / \_\_\_\_

Parity \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_  
previous births (live or still) previous miscarriage previous therapeutic abortion

Number of births this pregnancy (ie, singleton,twin,triplet etc) \_\_\_\_\_

#### DETAILS OF BABY

Hospital of Birth \_\_\_\_\_

Date of Delivery \_\_\_\_ / \_\_\_\_ / \_\_\_\_

Time of Birth (24hr clock) \_\_\_\_\_

Date of Death \_\_\_\_ / \_\_\_\_ / \_\_\_\_

Time of Death (24hr clock) \_\_\_\_\_

For Stillbirths: (please circle where appropriate)  
1 = Death before labour 2 = Death during labour

Late fetal death:  
5 = Termination under the Abortion Act  
6 = Miscarriage (spontaneous, missed or incomplete)

Place of death (if transferred) \_\_\_\_\_

Mode of delivery \_\_\_\_\_

Birthweight (gms) \_\_\_\_\_

Gender 1 = Male 2 = Female 0 = NK

Best Estimate of Gestation (Completed weeks) \_\_\_\_\_

For multiple pregnancies; birth order \_\_\_\_\_

PM Performed 0 = No 1 = Yes 9 = NK

#### Please send copies of:

- Maternity Summary / Discharge letter
- Paediatric Summary / Discharge letter
- Perinatal Meeting Summary
- Postmortem / Chromosomes report

Year

Serial No.

Surname

Postcode

CRN

Date of Birth

Previous births

Previous miscarriage

Previous therapeutic abortion

Numbir

Hospital of Birth

Delivery Date

Birth Time

Death Date

Death Time

Stillbirth

Late fetal death

Hospital death

Mode

Birthweight

Gender

Gestation

Birth Order

PM

RD Entry

OB Class

Ob code 1

Ob code 2

Ob code 3

Pd Class

Pd code 1

Pd code 2

Pd code 3

PNND cause of death

For ISD Use Only

Keyed by (initials)

Date

Keyed by (initials)

Date



## 10.11 New Enquiry Form 2011

**MEDICAL IN CONFIDENCE (WHEN COMPLETED)**

# SCOTTISH STILLBIRTH AND INFANT DEATH SURVEY 2011



Type of case

☐ Stillbirth

A baby delivered without signs of life  
after 23+6 weeks of pregnancy

☐ Early Neonatal Death

Death of a live born baby occurring  
before 7 completed days after birth

☐ Late Neonatal Death

Death of a live born baby occurring after the 7th  
day and before 28 completed days after birth

☐ Late Fetal Death

Infants born dead at 20 - 23 weeks of pregnancy  
or earlier if birthweight is 500g or more

### Brief instructions and guidance

1. Please complete this form and send copies of the following documents to the address on page 14:

- \* Maternity summary / discharge letter
- \* Paediatric summary / discharge letter
- \* Perinatal meeting summary
- \* Post mortem, limited post mortem and placental pathology reports
- \* Chromosomes report

2. Please complete all dates in the format DD/MM/YYYY, and all times using the 24hr clock eg 17:45

3. Please send this form and other information prior to receiving a full post mortem if it is not available

Please place a cross ☒ in the appropriate box or write your answer where indicated in black ink. If you answer incorrectly please fill in the box completely ☐ and reselect your desired answer.

Office use only

REF

DATE
















**Q1 (10) Partner's occupation**

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

☐ not known

**Q1 (11) Partner's age**

--	--

years

☐ not known/inapplicable

☐ no partner

**Q1 (12) Height at booking**

--	--	--

cm

**Q1 (13) Weight at booking**

--	--	--

kg

**Q1 (14) Body mass index (BMI) at booking:**

--	--

**Q1 (15) Smoking status:**

☐ Non-smoker ☐ Unknown ☐ Smoker

**Q1 (16) If a smoker, how many cigarettes per day?**

--	--

**Q1 (17) If non-smoker:**

☐ Never ☐ Gave up prior to pregnancy ☐ Gave up in pregnancy ☐ history not known

How many units of alcohol per week did the woman drink...

**Q1 (18) at booking? Q1 (19) prior to pregnancy?**

--	--

--	--

**Q1 (20) Was this woman known to be a substance misuser?**

☐ Yes ☐ No

If yes, please state the substances used, amounts, methods/route (eg IV, oral)


**Q1 (21) What prescribed medication did she take during pregnancy?**

Prescribed medication	Dose	Frequency	Route	Gestation commenced	Duration





## SECTION 2. PREVIOUS PREGNANCIES

**Parity** (NB parity refers to number of pregnancies, not babies)

Q2 (1)

previous pregnancies  $\geq$  24 weeks

Q2 (2)

previous miscarriages and ectopics

Q2 (3)

previous terminations < 24 weeks

**Outcome** (count all babies from multiple pregnancies separately)

Q2 (4)

previous live births

Q2 (5)

previous stillbirths\*

\* include any terminations which were performed  $>$  24 weeks

Q2 (6)

previous neonatal deaths (up to 28 days)

*please record numbers of each*

## SECTION 3. PREVIOUS MEDICAL HISTORY

**Q3 (1) Were there any pre-existing medical problems?**

☐ None

**Q3 (2) If yes, please check all that apply below**

- ☐ Cardiac disease (congenital or acquired)
- ☐ Endocrine disorders (eg hypo or hyperthyroidism)
- ☐ Haematological disorders (eg sickle cell disease, thrombophilias)
- ☐ Inflammatory disorders (eg inflammatory bowel disease)
- ☐ Diabetes type 1
- ☐ Diabetes type 2
- ☐ Epilepsy
- ☐ Renal disease
- ☐ Psychiatric disorders
- ☐ Drug or substance abuse
- ☐ Essential hypertension

Please detail the disorder

☐ Other please specify







		/		/				
--	--	---	--	---	--	--	--	--

☐ Yes ☐ No

		/			/				
--	--	---	--	--	---	--	--	--	--

--	--

weeks

☐☐☐ Undecided[illegible]

☐ Obstetric unit      ☐ Freestanding midwifery unit      ☐ Other  
☐ Alongside midwifery unit      ☐ Home

☐ Obstetric led care      ☐ Midwifery led care      ☐ Unknown

☐ Midwifery care only
 ☐ Not known  
☐ Consultant care throughout
 ☐ None  
☐ Mixed midwifery and consultant care





## SECTION 5. DELIVERY

### Q5 (1) Onset of labour:

☐ Spontaneous    ☐ Induced    ☐ Never in labour

### Intended place of delivery at onset of labour or admission for delivery:

#### Q5 (2) Please specify the type of unit:

☐ Same as Q4 (4) above    ☐ Alongside midwifery unit    ☐ Home  
☐ Obstetric unit    ☐ Freestanding midwifery unit    ☐ Other

Name of unit/place

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

### Q5 (3) Was the intended mode of delivery a planned caesarean section?

☐ Yes    ☐ No

### Q5 (4) Was this an in utero transfer?

☐ Yes    ☐ No

### Q5 (5) Actual place of delivery:

☐ Same as Q4 (4) above    ☐ Alongside midwifery unit    ☐ Home  
☐ Obstetric unit    ☐ Freestanding midwifery unit    ☐ Other

Name of unit/place

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

### Q5 (6) Date of delivery/birth:

--	--	--	--	--	--	--	--	--	--

### Time of delivery/birth:

--	--	--	--	--	--

### Q5 (7) What was the presentation AT DELIVERY?

☐ Cephalic    ☐ Compound (includes transverse and shoulder)    ☐ Face  
☐ Breech    ☐ Brow

### Q5 (8) What was the FINAL mode of delivery?

☐ Spontaneous vaginal    ☐ Assisted breech  
☐ Ventouse    ☐ Breech extraction  
☐ Lift-out forceps    ☐ Pre-labour caesarean section  
☐ Mid cavity forceps    ☐ Caesarean section after onset of labour  
☐ Rotational forceps





**Caesarean sections only - non CS go to section 6**

**Q5 (9) What was the type of caesarean section?**

- ☐ Elective (at a time to suit woman or maternity team)
- ☐ Scheduled (needing early delivery but not maternal or fetal compromise)
- ☐ Urgent (Maternal or fetal compromise which is not immediately life threatening)
- ☐ Emergency (immediate threat to life of woman or fetus)

**Q5 (10)** Cervical dilation at caesarean section: Not in labour

--	--

cm

☐

**SECTION 6. ALL BABY OUTCOMES** - If more than one baby/fetus died from this pregnancy please complete a separate ADDITIONAL BABY/FETAL OUTCOME SUPPLEMENT for each baby/fetus who died

**Q6 (1) Baby's surname:**

[illegible]

Q6 (2) Baby's first name:

[illegible]

**Q6 (3) Sex of fetus/baby:**

- ☐
- Male
- ☐
- Female
- ☐
- Indeterminate

**Q6 (4) Number of fetuses/babies this delivery:**

□

**Q6 (5) Birth order of this fetus/baby:**

0=singleton

**Q6 (6) If from a multiple delivery, what was the chorionicity?**

- ☐ Dichorionic diamniotic      ☐ Monochorionic monoamniotic      ☐ Not known  
☐ Monochorionic diamniotic      ☐ Trichorionic

**Q6 (7) Was this a fetus papyraceous?**

- ☐ Yes ☐ No

**Q6 (8) Birthweight (g):**

--	--	--	--

**Q6 (9) Gestation at delivery:**

--	--

weeks +		days
---------	--	------

**Q6 (10) Was this a termination of pregnancy?**

- ☐ Yes      ☐ No

**Q6 (11) Was the death due to an intrapartum event?**

- ☐ Yes      ☐ No

**Q6 (12) Was this death discussed at a local Perinatal Mortality Meeting?**

- ☐ Yes ☐ No *if answered yes, please attach a copy of the report*

**Q6 (13) If no, please state why not:**


**Q6 (14) Was there a root cause analysis?**

- ☐ Yes      ☐ No

**Q6 (15) Were antecedent factors identified?**

- ☐ Yes ☐ No      If yes, please detail below










## SECTION 9. MATERNAL DEATH

Q9 (1) Was this case a maternal death?

☐ Yes ☐ No

Q9 (2) If yes, please state the cause:

## SECTION 10. ASSOCIATED FACTORS AND CAUSE OF DEATH

Please check ALL the maternal or fetal conditions that were present during the pregnancy or appeared to contribute to the death

Q10 (1) Major congenital anomaly and chromosomal defects:

☐ Central nervous system    ☐ Gastro-intestinal system    ☐ Chromosomal disorders  
☐ Cardiovascular system    ☐ Musculo-skeletal anomalies    ☐ Metabolic diseases  
☐ Respiratory system    ☐ Multiple anomalies    ☐ Urinary tract

Please specify diagnosis

Q10 (2) Hypertensive disorders of pregnancy:

☐ Pregnancy induced hypertension    ☐ Pre-eclampsia    ☐ HELLP syndrome  
☐ Eclampsia

Q10 (3) Antepartum or intrapartum haemorrhage:

☐ Placenta praevia    ☐ Placental abruption    ☐ Other

If other, please specify

Q10 (4) Mechanical:

**Cord compression:**

☐ Prolapse cord    ☐ Cord around neck    ☐ Other cord entanglement or knot

**Uterine rupture:**

☐ Before labour    ☐ During labour

**Shoulder dystocia:**

☐

**Mal-presentation:**

☐ Breech    ☐ Face    ☐ Compound    ☐ Transverse    ☐ Other please specify

If other, please specify

Q10 (5) Maternal disorder:

☐ Pre-existing hypertensive disease    ☐ Other endocrine conditions    ☐ Drug misuse  
☐ Pre-existing diabetes    ☐ Thrombophilias    ☐ Uterine anomalies  
☐ Gestational diabetes    ☐ Obstetric cholestasis

☐ Other please specify





**Q10 (6) Infection:**

**Maternal infection:** ☐ Bacterial ☐ Viral diseases ☐ Protozoal  
☐ Other, specify

**Ascending infection:** ☐ Chorioamnionitis ☐ Other, please specify below

**Q10 (7) Specific fetal conditions:**

☐ Twin-twin transfusion ☐ Non immune hydrops ☐ Other  
☐ Feto-maternal haemorrhage ☐ Iso-immunisation

If other, please specify

**Q10 (8) Specific placental conditions:**

☐ Placental infarction ☐ Chronic villitis  
☐ Massive perivillous fibrin deposition ☐ Chronic intervillitis  
☐ Vasa praevia ☐ Fetal thrombotic vasculopathy  
☐ Velamentous insertion ☐ Cord hypocoiling  
☐ Deficient placental villus maturation ☐ Cord hypercoiling

Cord length  cm

☐ Other, specify

**Q10 (9) Intra-uterine growth restriction:**

Was this diagnosis made? ☐ Yes ☐ No

What was this based on? (please check all that apply)

☐ Suspected antenatally ☐ Observed at delivery ☐ Observed at post mortem

What led you to your suspicion

**Q10 (10) Associated obstetric factors:**

**Birth trauma:** ☐ Intracranial haemorrhage ☐ Birth injury to scalp  
☐ Fracture, specify   
☐ Other, specify

**Intrapartum anoxia** (evidence of significant hypoxia/anoxia during labour): ☐

**Other:** ☐ Polyhydramnios ☐ Premature rupture of membranes  
☐ Oligohydramnios ☐ Spontaneous premature delivery  
☐ Other, specify





**Q10 (11) Antecedent or associated obstetric factors:**

☐

**Q10 (12) Unable to classify because of lack of information:**

☐

**Q10 (13) Which condition, indicated in questions Q10 (1) to Q10 (12) as being present, was the MAIN condition causing or associated with the death (NB "non-MAIN" conditions are best described as the "Other clinically relevant maternal or fetal conditions/factors that were associated with but not necessarily causing the death". Please give the MAIN condition)**

## SECTION 11. CAUSE OF DEATH - NEONATES ONLY

**Please check ALL the neonatal conditions that appeared to contribute to the death:**

**Q11 (1) Major congenital anomaly:**

- |   |   |  |
|---|---|--|
| <input type="checkbox"/> Central nervous system | <input type="checkbox"/> Gastro-intestinal system   | <input type="checkbox"/> Chromosomal disorders |
| <input type="checkbox"/> Cardiovascular system  | <input type="checkbox"/> Musculo-skeletal anomalies | <input type="checkbox"/> Metabolic diseases    |
| <input type="checkbox"/> Respiratory system     | <input type="checkbox"/> Multiple anomalies         | <input type="checkbox"/> Urinary tract         |

If other, please specify

**Q11 (2) Immaturity:**

- ☐ < 22 weeks gestation      ☐ 22 to 24 weeks gestation

**Q11 (3) Respiratory disorders:**

- ☐ Severe pulmonary immaturity
- ☐ Surfactant deficiency lung disease
- ☐ Pulmonary hypoplasia
- ☐ Meconium aspiration syndrome
- ☐ Primary persistent pulmonary hypertension
- ☐ Chronic lung disease / Bronchopulmonary dysplasia (BPD)
- ☐ Other (for example, pulmonary haemorrhage, pneumonia, iatrogenic)

If other, please specify

**Q11 (4) Gastro-intestinal disease:**

- ☐ Necrotising enterocolitis (NEC)

If other, please specify





**Q11 (5) Neurological disorder:**

☐ Hypoxic-ischaemic encephalopathy (HIE) ☐ Intraventricular / Periventricular haemorrhage

If other please specify

**Q11 (6) Infection:**

☐ Sepsis (generalised) ☐ Pneumonia ☐ Meningitis

Other, please specify

Please specify the organism (eg group B streptococcus)

**Q11 (7) Injury / Trauma (including iatrogenic trauma) (post natal):**

Was trauma a factor?

☐ Yes ☐ No

If yes, please specify

**Q11 (8) Other specific causes:**

☐ Malignancies / tumours\* ☐ Specific conditions \*

\* please specify

**Q11 (9) Sudden unexpected deaths:**

☐ Sudden Unexpected Natural Death (includes SIDS)

☐ Neonatal death - cause unascertained

**Q11 (10) Unable to classify because of lack of information:**

☐

**Q11 (11) Which condition, indicated in questions Q11 (1) to Q11 (10) as being present, was the MAIN condition causing or associated with the death (NB "non-MAIN" conditions are best described as the "Other clinically relevant maternal or fetal conditions/factors that were associated with but not necessarily causing the death". Please give the MAIN condition)**

## SECTION 12. POST MORTEM

Please do not wait for post mortem results before sending this form

**Q12 (1) Was a post mortem offered?**

☐ Yes ☐ No

**Q12 (2) If offered, what grade was the member of staff seeking authorisation?**

<input type="checkbox"/> Consultant obstetrician	<input type="checkbox"/> Paediatric associate specialist / staff grade
<input type="checkbox"/> Specialist obstetric registrar	<input type="checkbox"/> FY2/GP trainee (ie SHO)
<input type="checkbox"/> Obstetric associate specialist / staff grade	<input type="checkbox"/> Midwife
<input type="checkbox"/> Consultant paediatrician	<input type="checkbox"/> Neonatal nurse
<input type="checkbox"/> Specialist paediatric registrar	<input type="checkbox"/> Other

If not offered, please state the reason(s)







**If PM declined, after offering, please state the reasoning**

--

☐ Full      ☐ External only with X-ray, MRI etc      ☐ Limited (specify sites below)

--

☐ Yes      ☐ No

☐ Yes      ☐ No

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\_\_\_\_\_

[illegible][illegible][illegible][illegible][illegible][illegible][illegible]

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## SECTION 15. OFFICE USE ONLY

Please code the causes of death that were given and the clinically derived single main cause of death (refer to the coding sheet)

Cause of death: Associated maternal and fetal factors and cause of death - Stillbirth and neonates (section 10)

Q15 (1) Single main cause:

Q15 (2) Other cause(s): (No more than 3)


Cause of death: Associated neonatal factors and cause of death - neonatal deaths only (section 11)

Q15 (3) Single main cause:

Q15 (4) Other cause(s): (No more than 3)


Q15 (5) Congenital anomalies

Q15 (6) ICD10 code(s)


Q15 (7) Was a copy of the post mortem report received?

☐ Yes ☐ No ☐ No post mortem

Q15 (8) If yes, was it a full post mortem?

☐ Yes ☐ No

Q15 (9) If no, was it external only (including X-ray, MRI etc)

☐ Yes ☐ No

If limited, please specify the sites

Q15 (10) If yes, was it a Procurator Fiscal post mortem?

☐ Yes ☐ No

Q15 (11) Was a copy of the placental histology report received?

☐ Yes ☐ No ☐ Not done

Q15 (12) Was the cause of death coding completed using a placental histology and/or post mortem report?

☐ Placental histology ☐ Post mortem ☐ No





**Please return this completed form to:**

**Leslie Marr / Kenny Gifford  
Reproductive Health Programme Team  
NHS Quality Improvement Scotland  
Elliott House  
8-10 Hillside Crescent  
Edinburgh  
EH7 5EA**





