

Perinatal Mortality Report 2007 Feedback Report

Northern Ireland

Section 1: the resident population of Northern Ireland

Table 1

Northern Ireland stillbirth, perinatal and neonatal deaths rates: 2007.

	Northern Ireland		England, Wales & Northern Ireland
	Rate [95% CI] – all cases	Rate [95% CI] – adjusted ¹	Rate [95% CI] – adjusted ¹
Stillbirths ²	4.2 [3.4, 5.0]	3.1 [2.5, 3.9]	3.9 [3.7, 4.0]
Perinatal deaths ²	7.0 [6.0, 8.1]	4.1 [3.4, 5.0]	5.4 [5.2, 5.5]
Neonatal deaths ³	3.3 [2.7, 4.1]	1.1 [0.8, 1.6]	2.0 [1.9, 2.1]

¹ Adjustments: terminations, lethal malformations, gestation <22 weeks and birth weight <500g are excluded

² Rate per 1000 total births

³ Rate per 1000 live births

Explanation: Table 1

Table 1 shows crude and adjusted mortality rates for the resident population of Northern Ireland. The adjusted rates show the death rates by removing all terminations, malformations, babies born at <22 weeks' gestation and <500g birth weight. The national death rates for England, Wales and Northern Ireland are also shown as a comparator.

Table 2

Trends of stillbirth, perinatal and neonatal death rates: 2005-2007.

	Rate per 1000 [95% CI]				χ^2 p-value
	2005	2006	2007	Total	
Stillbirth ^{1,2}	3.3 [2.7, 4.2]	3.0 [2.4, 3.8]	3.1 [2.5, 3.9]	3.2 [2.8, 3.6]	0.80
Perinatal death ^{1,2}	5.4 [4.5, 6.4]	4.2 [3.4, 5.1]	4.1 [3.4, 5.0]	4.5 [4.1, 5.1]	0.09
Neonatal death ^{1,3}	2.7 [2.1, 3.5]	1.6 [1.2, 2.2]	1.1 [0.8, 1.6]	1.8 [1.5, 2.1]	0.000

¹ Adjusted by removing terminations, lethal malformations, gestation <22 weeks and birth weight <500g

² Rate per 1000 total births

³ Rate per 1000 live births

Explanation: Table 2

Table 2 shows the adjusted rates for the resident population of Northern Ireland in 2005, 2006 and 2007, the total rates over the three years and a p-value using a χ^2 test to test for a difference in the three years. If the p-value is greater than 0.05, then there is no statistically significant difference between the rate over the three years. However, if the p-value is less than 0.05, then there is a statistically significant difference between the rate over the three years. A smaller p-value indicates a more significant difference.

Table 3

Terminations, lethal malformations, gestation and birth weight: 2007.

	Stillbirths	Early neonatal deaths	Late neonatal deaths
Deaths that are Excluded from Adjusted Rates			
Terminations	7	6	0
Lethal malformations ¹	13	27	8
Gestation <22 weeks ²	0	6	0
Birth weight <500g ³	5	7	0
Deaths that are Included in Adjusted Rates			
Birth weight ≥500g ⁴	77	24	3
Total	102	70	11

¹ Excluding terminations

² Excluding terminations and lethal malformations

³ Excluding terminations, lethal malformations and gestation <22 weeks

⁴ Excluding terminations, lethal malformations, gestation <22 weeks and birth weight <500g

Explanation: Table 3

Table 3 shows the deaths that have been removed in the calculation of the adjusted rates. The figures in the birth weight ≥500g row are those that are used to calculate the adjusted rates.

Table 4
Reported cases by place of booking and place of death: 2007.

	Stillbirths	Early neonatal deaths	Late neonatal deaths	Live births
Booked ¹ and died within Northern Ireland	100	68	9	
Booked ¹ elsewhere and died within Northern Ireland	0	0	0	
Booked ¹ within Northern Ireland and died elsewhere	1	0	0	
Booked ¹ elsewhere and died elsewhere	0	0	0	
Place of booking and/or death other ²	1	2	2	
Total	102	70	11	24451

¹ Represents intended place of delivery at initial booking

² Place of booking and/or death other includes missing, unbooked, outside the hospital, outside the UK and not known

Explanation: Table 4

Table 4 shows where women who were resident within Northern Ireland booked to deliver and where their baby/babies died. In showing location of booking and death, Northern Ireland can assess deaths that may occur among babies that have been transferred into or out of Northern Ireland.

Table 5
Stillbirths and neonatal deaths by multiplicity: 2007¹.

	Stillbirths	Early neonatal deaths	Late neonatal deaths
Singleton	86	53	9
Multiple	9	11	2
Unknown	0	0	0
Total	95	64	11

¹ These numbers are excluding terminations

Explanation: Table 5

Table 5 shows the number of deaths among singleton and multiple pregnancies of the resident population of Northern Ireland.

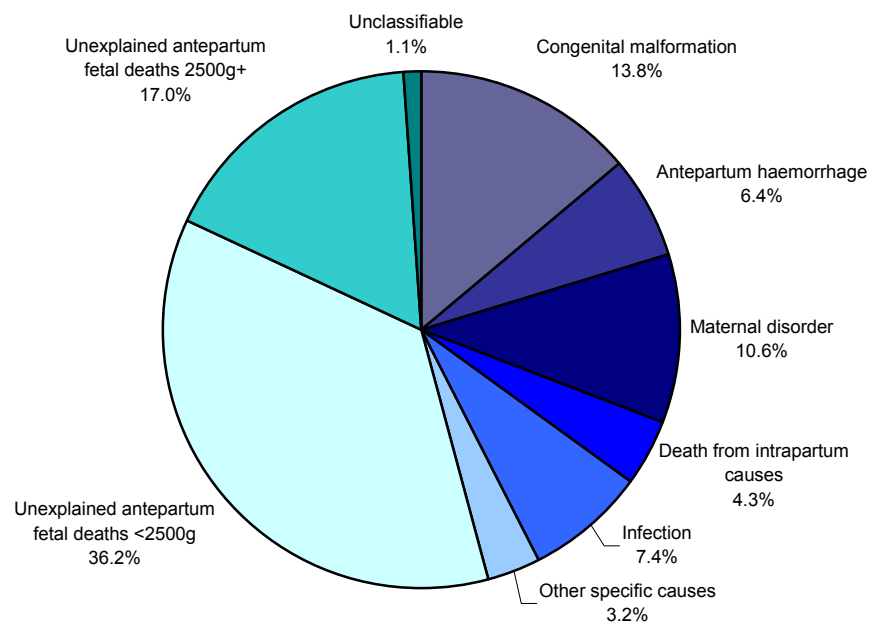
Table 6
Post mortems notified to CEMACH: 2007.

	Stillbirths	Early neonatal deaths	Late neonatal deaths	Total
	n (%)			
Northern Ireland	53 (52)	20 (29)	4 (36)	77 (42)
England, Wales and Northern Ireland	1623 (44)	481 (26)	143 (29)	2247 (37)

Explanation: Table 6

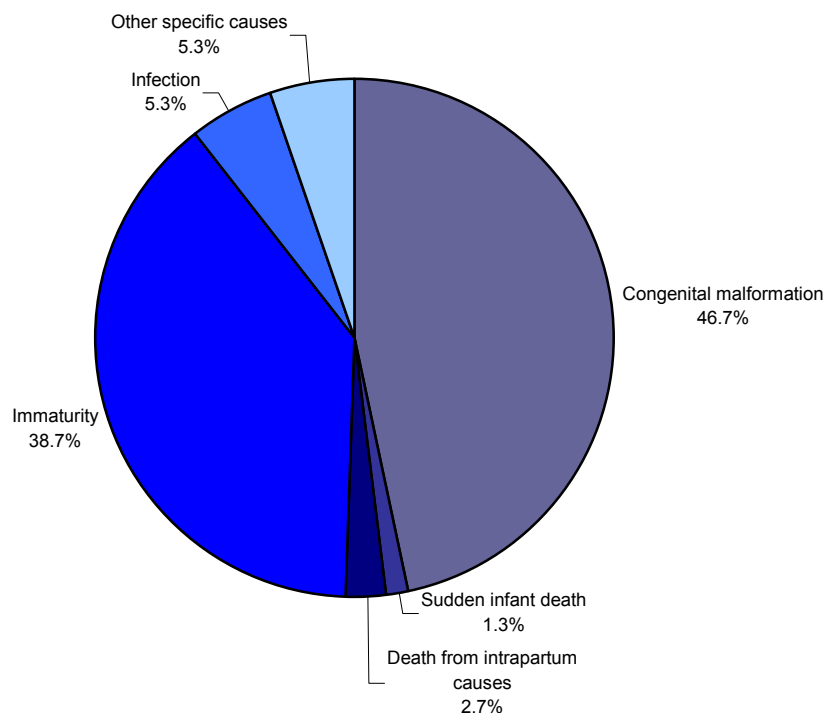
Table 6 shows the number and percentage of post mortems performed on stillbirths and on neonatal deaths of the resident population of Northern Ireland. It also provides comparison figures for England, Wales and Northern Ireland.

Figure 1
Percentage distribution of causes of stillbirths (n= 94): 2007¹.



¹ These numbers are excluding terminations

Figure 2
Percentage distribution of causes of neonatal deaths (n= 75): 2007¹.



¹ These numbers are excluding terminations

Explanation: Figures 1 and 2

These pie charts show the distribution of cause of death for stillbirths and neonatal deaths of the resident population of Northern Ireland. The cause of death for stillbirths is classified using the Wigglesworth classification supplemented by the Aberdeen Obstetric classification. The cause of death for neonatal death is classified using the Wigglesworth classification only.

Figure 3
Birth weight and gestational age distribution of stillbirths: 2007.

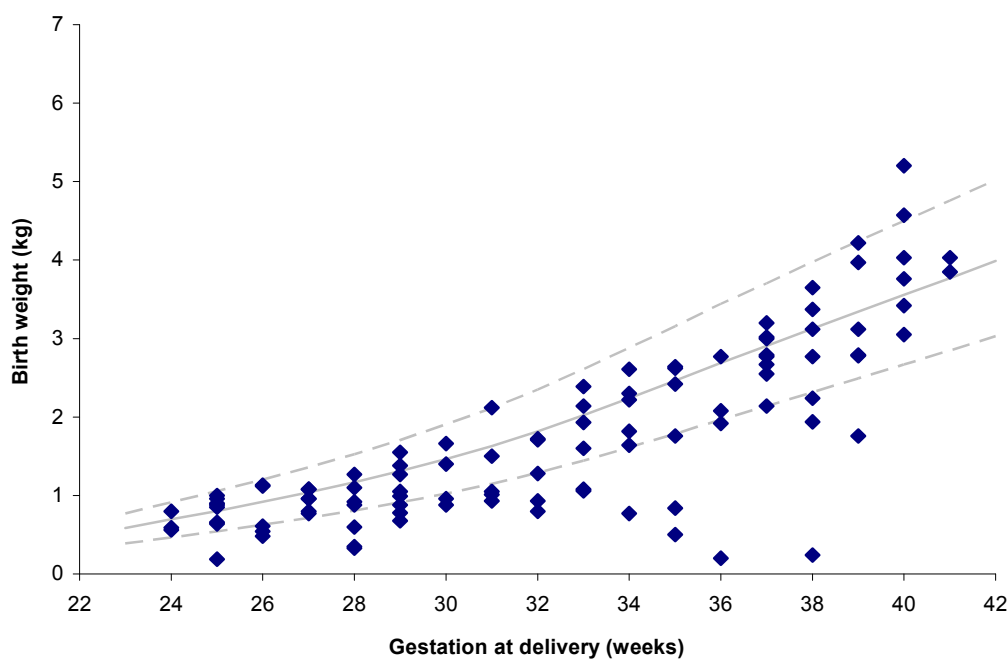
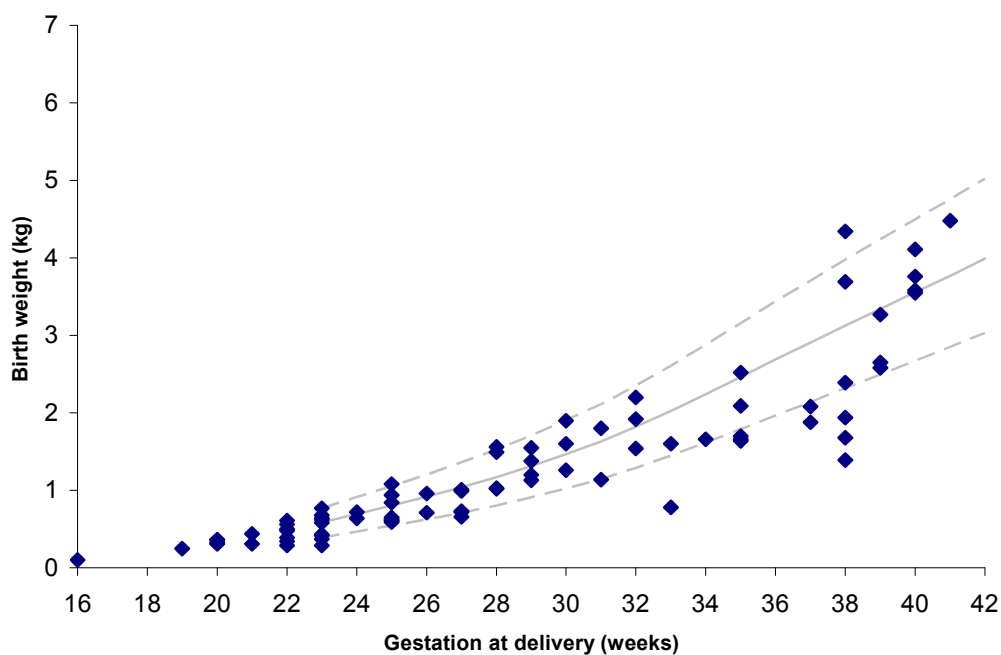


Figure 4
Birth weight and gestational age distribution of neonatal deaths: 2007.



Explanation: Figures 3 and 4

These scatter graphs show the gestation against birth weight distribution for stillbirths and neonatal deaths. Generally the scatter points will lie in a diagonal strip between the two dotted lines.¹ Any points that are below this strip are babies that are small for their gestational age (<3rd centile) and any points that are above this strip are babies that are large for their gestational age (>97th centile).

¹ Child Growth Foundation. *British 1990 Growth Reference for Height, Weight, BMI and Head Circumference analysis disk*, 2001.

Section 2: Trusts providing maternity services within Northern Ireland

Table 7

Trust specific stillbirth rates within Northern Ireland: 2007.

	Rate per 1000 total births [95% CI]		
	Rate - all cases	Died Rate - adjusted ¹	Booked and died Rate - adjusted ¹
Belfast Health and Social Care Trust	4.0 [2.8, 5.9]	2.7 [1.7, 4.3]	2.7 [1.7, 4.3]
Northern Health and Social Care Trust	5.8 [3.9, 8.5]	4.0 [2.5, 6.4]	4.0 [2.5, 6.4]
South Eastern Health and Social Care Trust	2.6 [1.5, 4.8]	1.4 [0.6, 3.2]	1.4 [0.6, 3.2]
Southern Health and Social Care Trust	3.6 [2.3, 5.5]	3.6 [2.3, 5.5]	3.6 [2.3, 5.5]
Western Health and Social Care Trust	4.5 [2.9, 7.2]	4.0 [2.5, 6.6]	3.5 [2.1, 6.0]

¹ Adjustments: terminations, lethal malformations, gestation <22 weeks and birth weight <500g are excluded

Table 8

Trust specific neonatal death rates within Northern Ireland: 2007.

	Rate per 1000 live births [95% CI]		
	Rate - all cases	Died Rate - adjusted ¹	Booked and died Rate - adjusted ¹
Belfast Health and Social Care Trust	6.6 [4.9, 8.9]	2.3 [1.4, 3.7]	0.9 [0.4, 2.0]
Northern Health and Social Care Trust	1.8 [0.9, 3.6]	0.4 [0.1, 1.8]	0.2 [0.0, 1.6]
South Eastern Health and Social Care Trust	1.9 [1.0, 3.8]	0.7 [0.2, 2.2]	0.7 [0.2, 2.2]
Southern Health and Social Care Trust	2.2 [1.3, 3.8]	0.9 [0.4, 2.1]	0.9 [0.4, 2.1]
Western Health and Social Care Trust	2.3 [1.2, 4.4]	0.5 [0.1, 2.0]	0.3 [0.0, 1.8]

¹ Adjustments: terminations, lethal malformations, gestation <22 weeks and birth weight <500g are excluded

Explanation: Tables 7 and 8

Tables 7 and 8 show the stillbirth and neonatal death rates for the Trusts that are located within Northern Ireland. The rates for all cases show the crude death rates for these Trusts. The adjusted rates show the death rates for the Trusts by removing all terminations, malformations, babies born at <22 weeks' gestation and <500g birth weight.

The tables show rates for cases that **died** within the Trust which includes all cases regardless of where they booked to deliver i.e. babies who transferred into the Trust for treatment from other Trusts. It also shows rates for cases that **booked and died** within the Trust which excludes the babies that transferred into the Trust. The difference between the two rates shows the effect of transfers between Trusts in respect of mortality. If there is a level 2 or 3 neonatal unit within the Trust, then there is likely to be a large difference, showing that the Trust receives high risk, complex cases from other Trusts. If there is a level 1 or 2 neonatal unit within the Trust, then there is likely to be a small difference, showing that the Trust receives lower risk and less complex cases from other Trusts.

Table 9**Trust specific trends of stillbirth rates within Northern Ireland: 2005-2007.**

	Rate per 1000 per [95% CI] ¹				χ^2 p-value
	2005	2006	2007	Total	
Belfast Health and Social Care Trust	3.2 [2.1, 5.0]	3.4 [2.3, 5.2]	2.7 [1.7, 4.3]	3.1 [2.4, 4.0]	0.75
Northern Health and Social Care Trust	3.4 [1.9, 6.0]	1.8 [0.9, 3.9]	4.0 [2.5, 6.4]	3.1 [2.3, 4.3]	0.20
South Eastern Health and Social Care Trust	4.0 [2.4, 6.7]	4.2 [2.6, 6.8]	1.4 [0.6, 3.2]	3.2 [2.3, 4.4]	0.05
Southern Health and Social Care Trust	3.7 [2.4, 5.8]	1.7 [0.9, 3.2]	3.6 [2.3, 5.5]	3.0 [2.3, 3.9]	0.09
Western Health and Social Care Trust	3.2 [1.8, 5.6]	3.6 [2.1, 6.1]	4.0 [2.5, 6.6]	3.6 [2.7, 4.9]	0.82

¹ Rates have been adjusted by removing terminations, lethal malformations, gestation <22 weeks and birth weight <500g**Table 10****Trust specific trends of neonatal death rates within Northern Ireland: 2005-2007.**

	Rate per 1000 [95% CI] ¹				χ^2 p-value
	2005	2006	2007	Total	
Belfast Health and Social Care Trust	6.0 [4.3, 8.2]	2.7 [1.7, 4.3]	2.3 [1.4, 3.7]	3.6 [2.8, 4.5]	<0.001
Northern Health and Social Care Trust	1.4 [0.6, 3.4]	1.3 [0.5, 3.2]	0.4 [0.1, 1.8]	1.0 [0.6, 1.8]	0.31
South Eastern Health and Social Care Trust	0.3 [0.0, 1.9]	0.5 [0.1, 2.1]	0.7 [0.2, 2.2]	0.5 [0.2, 1.1]	0.68
Southern Health and Social Care Trust	1.4 [0.7, 2.9]	1.5 [0.7, 2.9]	0.9 [0.4, 2.1]	1.2 [0.8, 1.9]	0.60
Western Health and Social Care Trust	2.9 [1.6, 5.3]	0.8 [0.2, 2.4]	0.5 [0.1, 2.0]	1.4 [0.8, 2.2]	0.008

¹ Rates have been adjusted by removing terminations, lethal malformations, gestation <22 weeks and birth weight <500g**Explanation: Tables 9 and 10**

Tables 9 and 10 show the adjusted rates for cases that died within the Trust in 2005, 2006 and 2007, the total rates over the three years and a p-value using a χ^2 test to test for a difference in the three years. If the p-value is greater than 0.05, then there is no statistically significant difference between the rate over the three years. However, if the p-value is less than 0.05, then there is a statistically significant difference between the rate over the three years. A smaller p-value indicates a more significant difference.

Figure 5

Adjusted¹ stillbirth rates compared to the average trust stillbirth rate and associated 95% confidence intervals for all cases that died at the Trust; England, Wales and Northern Ireland: 2007.

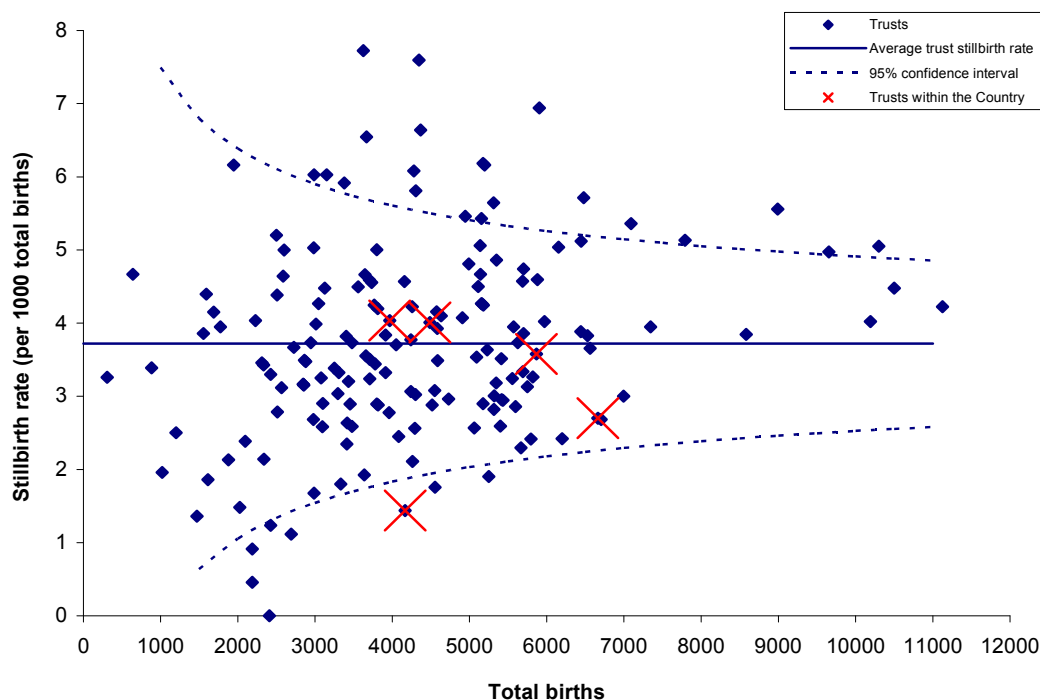
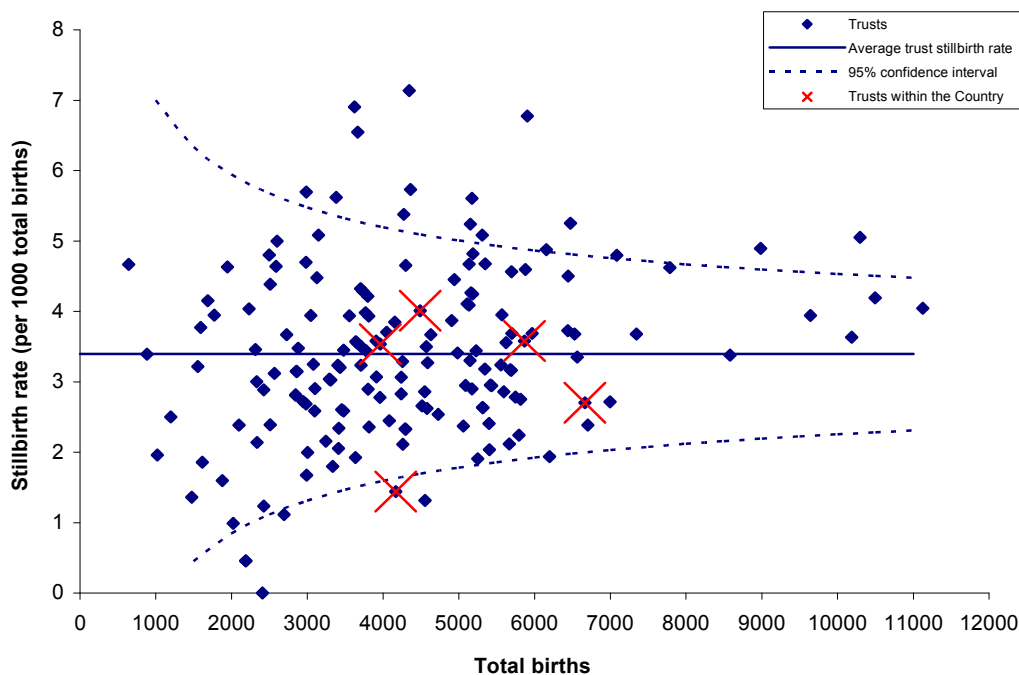


Figure 6

Adjusted¹ stillbirth rates compared to the average trust stillbirth rate and associated 95% confidence intervals for all cases that booked and died at the Trust; England, Wales and Northern Ireland: 2007.



¹ The rates have been adjusted by removing all terminations of pregnancy, all lethal malformations, all babies <22 weeks gestation and all babies <500g in weight.

Figure 7

Adjusted¹ neonatal death rates compared to the average trust neonatal death rate and associated 95% confidence intervals for all cases that died at the Trust; England, Wales and Northern Ireland: 2007.

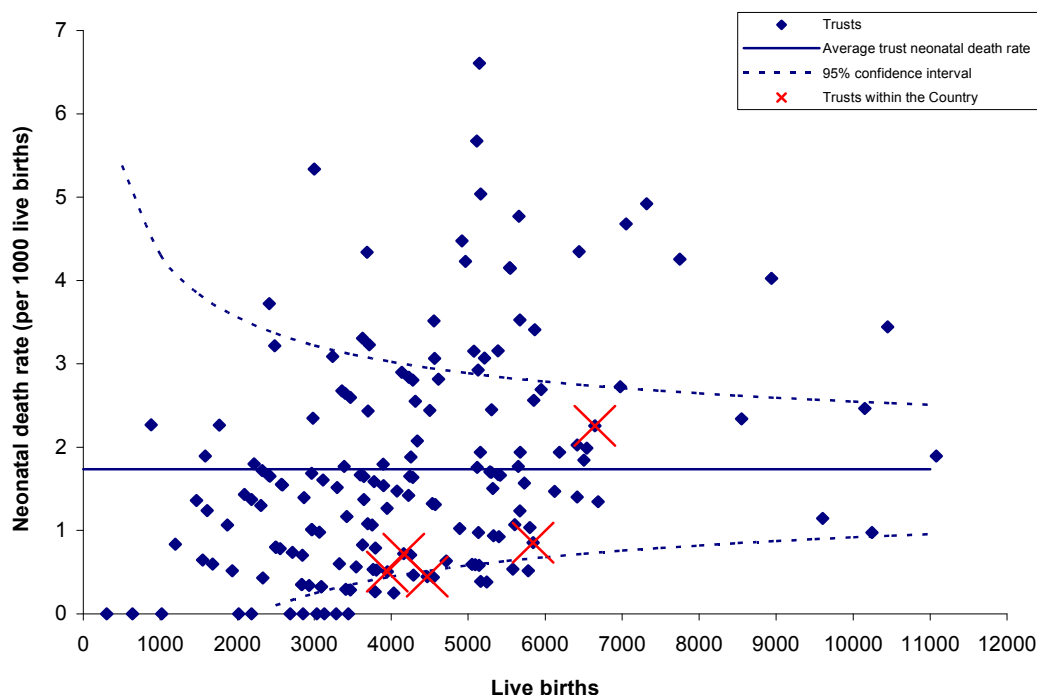
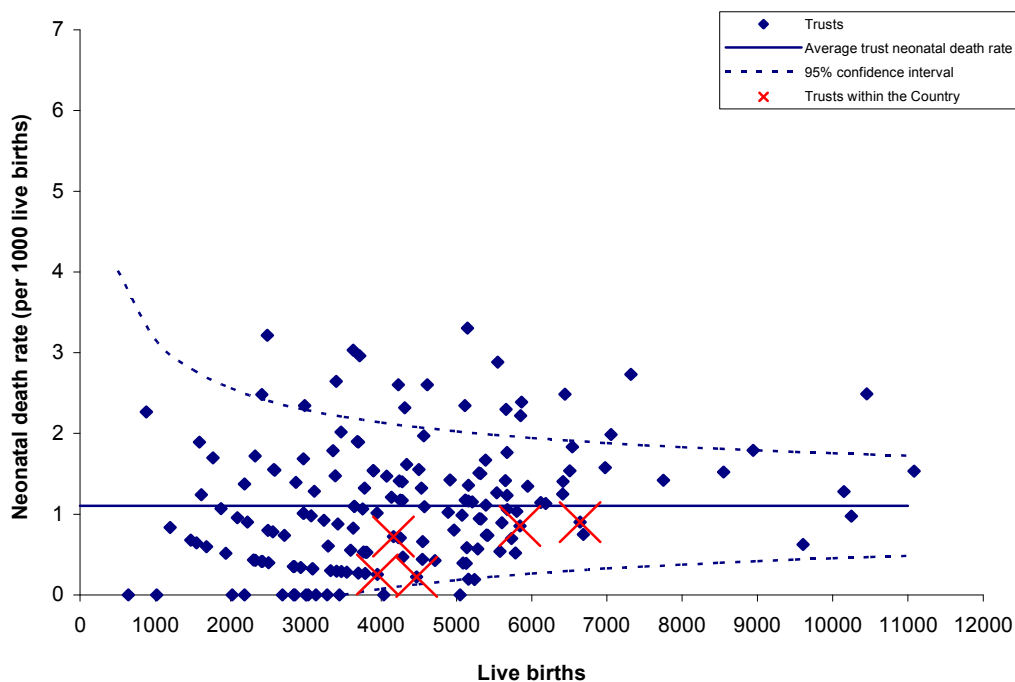


Figure 8

Adjusted¹ neonatal death rates compared to the average trust neonatal death rate and associated 95% confidence intervals for all cases that booked and died at the Trust; England, Wales and Northern Ireland: 2007.



¹ The rates have been adjusted by removing all terminations of pregnancy, all lethal malformations, all babies <22 weeks gestation and all babies <500g in weight.

Explanation: Figures 5 to 8

Figures 5 to 8 show death rates for Trusts providing maternity services plotted against the total number of annual births, the average trust rate and associated 95% confidence intervals. If a trust lies within the 95% confidence interval (dotted lines), it has a death rate that is statistically consistent with the average trust rate (solid line). If a trust lies outside the 95% confidence interval, then it has a death rate that is significantly different from the average trust rate. The red crosses denote the positions of the Trusts within Northern Ireland.

Figure 5 shows the stillbirth rate for all babies that **died** within the Trust and figure 6 shows the stillbirth rate for all babies that **booked and died** at the Trust. There is likely to be very little difference between the positions of the Trust between plots indicating little effect of transfers in relation to stillbirths.

Figure 7 shows the neonatal mortality rate for all babies that **died** within the Trust and figure 8 shows the neonatal mortality rate for all babies that **booked and died** within the Trust. Figure 7 includes all the cases it accepts from other Trusts that subsequently die. Figure 8 removes these babies. If there is a level 2 or 3 neonatal unit within the Trust, then there is likely to be substantial difference between the positions of the Trust between plots. If there is a level 1 or 2 neonatal unit within the Trust, then there is likely to be little difference between the positions of the Trust between plots. Trusts that have level 3 neonatal units are likely to move from being an outlier in figure 7 to being closer to the 95% confidence intervals in figure 8.

The intention of this report enables Northern Ireland to see how the Trusts they commission are performing and also to benchmark them against other Trusts within England, Wales and Northern Ireland.

Figure 9

Adjusted¹ neonatal death rates for hospitals with level 1 or level 2 neonatal units compared to the average level 1 or level 2 neonatal death rate and associated 95% confidence intervals for all cases that booked and died at the hospital; England, Wales and Northern Ireland: 2007.

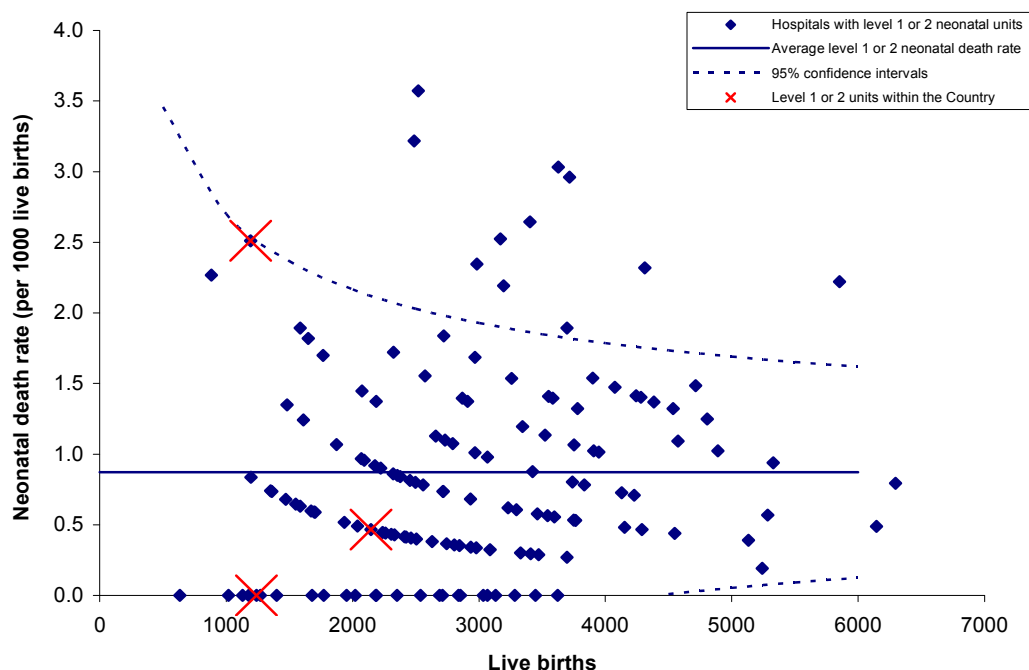
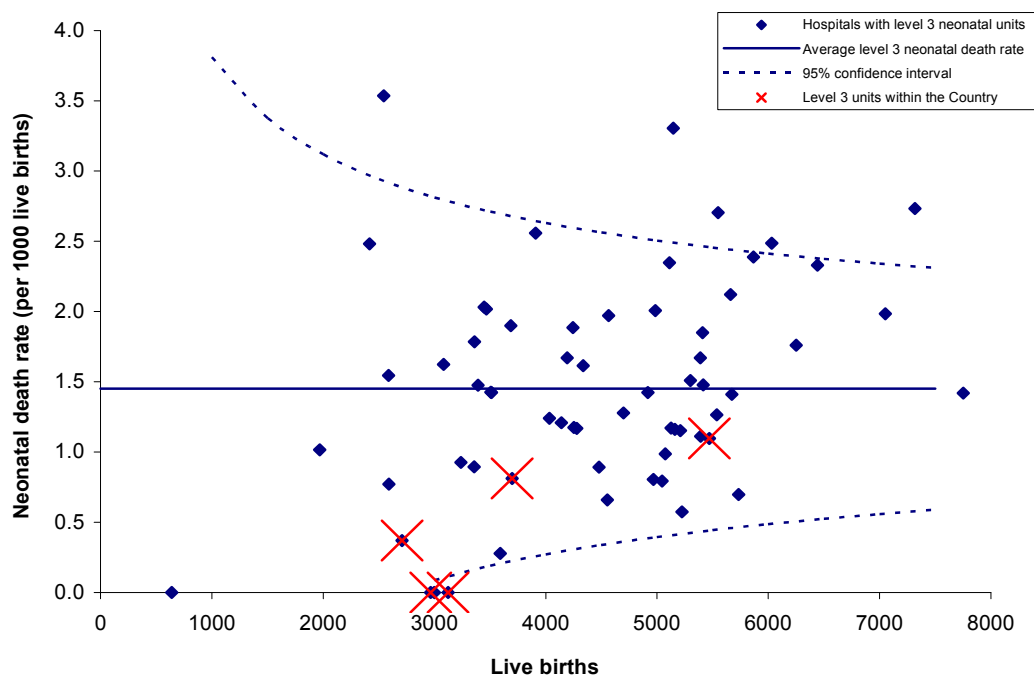


Figure 10

Adjusted¹ neonatal death rates for hospitals with level 3 neonatal units compared to the average level 3 neonatal death rate and associated 95% confidence intervals for all cases that booked and died at the hospital; England, Wales and Northern Ireland: 2007.



¹ The rates have been adjusted by removing all terminations of pregnancy, all lethal malformations, all babies <22 weeks gestation and all babies <500g in weight and the cases that booked outside of the hospital.

Explanation: Figures 9 and 10

Figures 9 and 10 show death rates for hospitals providing maternity services plotted against the total number of annual live births, the average rate and associated 95% confidence intervals. If a hospital lies within the 95% confidence interval (dotted lines), it has a death rate that is statistically consistent with the average hospital rate (solid line). If a hospital lies outside the 95% confidence interval, then it has a death rate that is significantly different from the average hospital rate. The red crosses denote the positions of the hospitals within Northern Ireland.

Figure 9 shows the neonatal death rate for all babies that booked and died at a hospital with a level 1 or a level 2 neonatal unit. Figure 10 shows the neonatal death rate for all babies that booked and died at a hospital with a level 3 neonatal unit. This split has been done so that Northern Ireland can compare their hospitals against other hospitals with the same levels of neonatal care, and so are more likely to have cases of similar severity or complexity.

Methodology

The findings in this report are based on perinatal deaths notified to CEMACH and reported to the Office for National Statistics (ONS) with a date of birth between 1 January 2007 and 31 December 2007. For trust rates, denominators are based on live births reported to CEMACH by units. For country rates, denominators are based on live births reported to ONS and NISRA-GRO.

Because of changes within ONS there may be some cases shown in this report that have been notified to CEMACH very late, and therefore, none of these cases have been verified with the trusts.

Perinatal mortalities in this report are assigned to a geographical area. Country specific findings are derived using maternal postcode of residence. Findings for Trusts within Northern Ireland are derived using the place of death and any home births were allocated to the Trust that provided the care. The rates in the trust specific reports for 2005 and 2006 were calculated differently to the rates in this year's report: 2005 assigned cases by place of delivery, and 2006 reports excluded home and in transit deaths that were cared for by the trust. Therefore, the rates in Tables 9 and 10 may differ to those previously reported in your 2005 and 2006 reports.

Adjusted rates are calculated by removing all terminations, all lethal malformations, all babies born at less than 22 weeks gestation and all babies born weighing less than 500g.

Variation in rates should not be interpreted as direct indicators of the quality of care.

The definitions that are used within this report are detailed in the table below:

Definitions	
Stillbirth	A baby delivered with no signs of life after 24 completed weeks of pregnancy is registered as a stillbirth.
Early neonatal death	Death of a live born baby occurring less than 7 days from the time of birth.
Late neonatal death	Death of a live born baby occurring after the 7 th day and before 28 completed days from the time of birth.
Stillbirth rate	Number of stillbirths per 1000 live births and stillbirths.
Perinatal mortality rate	Number of stillbirths and early neonatal deaths per 1000 live births and stillbirths.
Neonatal mortality rate	Number of neonatal deaths per 1000 live births.

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