



Centre for Maternal and Child Enquiries

Perinatal and Maternal Mortality 2009 Feedback Report

Northern Ireland

Methodology

Perinatal Mortality

The findings in this report are based on stillbirths and neonatal deaths with a date of birth between 1 January 2009 and 31 December 2009 notified to CMACE and reported to the Office for National Statistics (ONS). For Trust rates, denominators are based on live births reported to CMACE by hospitals. For Strategic Health Authority (SHA) and country rates, denominators are based on live births reported to ONS and Northern Ireland Statistics and Research Agency (NISRA).

Perinatal mortality rates for 2009 are assigned to a geographical area and are derived using maternal postcode of residence. Findings for Trusts are derived using the place of death, and any deaths at home are allocated to the Trusts that provided the care at the time of death.

The scatter graphs showing gestation at delivery plotted against birth weight for stillbirths and neonatal deaths use the Child Growth Foundation's growth reference¹ calculation to produce the centile lines. Any points below the 3rd centile are small for their gestational age and any points above the 97th centile are large for their gestational age.

Adjusted rates are calculated by excluding all terminations of pregnancy and all babies born at less than 22 weeks' gestation.

Trusts are assigned a level of neonatal care by using the highest level assigned to the hospitals within the Trust by the Neonatal Networks in England, All Wales Perinatal Survey (AWPS) in Wales and Neonatal Intensive Care Outcomes Research and Evaluation (NICORE) in Northern Ireland using the British Association of Perinatal Medicine (BAPM) definitions.

The funnel plots show adjusted mortality rates for Trusts plotted against the total number of births per year, the overall mortality rate and associated 95% and 99% confidence intervals. If a Trust lies within the confidence intervals (dotted lines), it has a mortality rate that is statistically consistent with the overall mortality rate (solid line). If a Trust lies outside the confidence intervals, then it has a mortality rate that is significantly different from the overall mortality rate, and is considered an outlier.

The funnel plot for neonatal mortality shows the Trusts in Northern Ireland against other Trusts with the same highest level of neonatal care. This allows comparison between Trusts that are likely to have cases of similar severity and complexity.

During 2009, no providers in Northern Ireland were identified as an outlier using these criteria.

Maternal Mortality

The findings in this report are based on maternal deaths, where the woman died between 1 January 2004 and 31 December 2008, notified to CMACE and reported to ONS. For SHA and country rates, denominators are based on maternities reported to ONS, NISRA and General Register Office for Scotland (GROS). Maternal mortality rates are assigned to a geographical area using postcode of residence.

How is a maternal death ascertained?

Surveillance inclusion criteria for maternal deaths are:

- Any direct maternal death occurring during pregnancy, or within 42 days of delivery or termination of pregnancy.
- Any indirect maternal death occurring during pregnancy, or within 42 days of delivery or termination of pregnancy.

Direct death is defined as resulting from obstetric complications of the pregnant state (pregnancy, labour and puerperium), from interventions, omissions, incorrect treatment, or from a chain of events resulting from any of the above.

Indirect death is defined as resulting from previous existing disease, or disease that developed during pregnancy and which was not due to direct obstetric causes, but which was aggravated by the physiologic effects of pregnancy.

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

Maternal deaths are notified to the CMACE office where the woman was resident. A maternal death notification (MDN) form is completed. A maternal death report (MDR) form is sent to those involved in the care of the woman.

The MDR and anonymised case notes are assessed for cause and type of death.

How is the rate calculated?

The rate for the SHA or country is calculated by dividing the number of maternal deaths of residents between 2004 and 2008 by the number of maternities and by multiplying the result by 100,000.

What does the rate mean?

The rate is the number of maternal deaths in the SHA or country per 100,000 maternities. The 95% confidence intervals are also shown on the graph. If the confidence interval overlaps the line for the UK then the rate is not significantly different from the UK rate, but if the confidence interval does not overlap the line for the UK then the rate is significantly different from the UK rate. If the confidence interval overlaps another confidence interval for another SHA or country then the rates are not significantly different, however if they do not overlap then they are significantly different.

Variation in rates cannot 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 1,000 live births and stillbirths.
Perinatal mortality rate	Number of stillbirths and early neonatal deaths per 1,000 live births and stillbirths.
Neonatal mortality rate	Number of neonatal deaths per 1,000 live births.
Maternal mortality rate	Number of maternal deaths per 100,000 maternities.
Crown Dependencies	Channel Islands (Jersey and Guernsey) and Isle of Man.

CMACE, Chiltern Court, 188 Baker Street, London NW1 5SD
Tel: 020 7486 1191 Fax: 020 7486 6226
Web: www.cmace.org.uk Email: datateam@cmace.org.uk

© CMACE 2010

Please note: All rights are reserved. Please do not reproduce, distribute, modify, display or communicate the contents of this document without specific authorisation.

Section 1 Description of the stillbirths and neonatal deaths whose mothers were resident in Northern Ireland

This section includes stillbirths and neonatal deaths whose mother's postcode lies in Northern Ireland, regardless of where they booked to deliver, delivered or died.

Table 1
Place of booking and place of death of the stillbirths and neonatal deaths whose mothers were resident in Northern Ireland: 2009.

	Stillbirths	Early neonatal deaths	Late neonatal deaths	Live births
Booked ^a and died in Northern Ireland	117	80	10	
Booked ^a elsewhere and died in Northern Ireland	1	0	0	
Booked ^a in Northern Ireland and died elsewhere	0	0	0	
Booked ^a elsewhere and died elsewhere	0	0	0	
Place of booking and/or death other ^b	1	5	5	
Total	119	85	15	24,910

^aRepresents intended place of delivery at initial booking

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

Table 2
Occurrence of high risk factors for the stillbirths and neonatal deaths whose mothers were resident in Northern Ireland: 2009.

	Stillbirths	Early neonatal deaths	Late neonatal deaths
Terminations of pregnancy ^a	2	4	0
Gestation <22 weeks ^a	0	12	0
Number of deaths after these exclusions^b	117	71	15
Major congenital anomaly as primary cause of death ^a	16	34	9
Birth weight <500g ^a	7	16	0
Number of deaths after all exclusions	96	35	6

^aThese categories are overlapping

^bThese numbers are used to calculate the adjusted mortality rates for Northern Ireland

Table 3
Obstetric factors among stillbirths and neonatal deaths whose mothers were resident in Northern Ireland: 2009.

		n (%) ^a		
		Stillbirths	Early neonatal deaths	Late neonatal deaths
Booking for antenatal care ^b	<12+0	51 (44)	25 (32)	2 (13)
	12+0 to 19+6	57 (49)	52 (66)	13 (87)
	≥ 20+0	8 (7)	0 (0)	0 (0)
	Unbooked	1 (1)	2 (3)	0 (0)
	Not known	0	2	0
Parity ^b	Nulliparous	57 (49)	36 (46)	7 (47)
	Multiparous	60 (51)	43 (54)	8 (53)
	<i>Missing</i>	0	2	0
Plurality ^b	Singleton	112 (96)	73 (91)	14 (93)
	Multiple	5 (4)	7 (9)	1 (7)
	<i>Missing</i>	0	1	0
Pre-existing medical problems ^b	Yes	30 (26)	26 (33)	1 (7)
	No	87 (74)	54 (68)	14 (93)
	<i>Missing</i>	0	1	0
Previous pregnancy problems ^b	Yes	32 (27)	20 (25)	5 (33)
	No	37 (32)	34 (43)	6 (40)
	No previous pregnancies	48 (41)	26 (33)	4 (27)
	<i>Missing</i>	0	1	0
Mode of delivery	Spontaneous vaginal	77 (65)	38 (45)	6 (40)
	Ventouse	2 (2)	2 (2)	2 (13)
	Forceps	6 (5)	2 (2)	0 (0)
	Assisted breech	11 (9)	6 (7)	1 (7)
	Breech extraction	4 (3)	5 (6)	0 (0)
	Caesarean section	19 (16)	31 (37)	6 (40)
	<i>Missing</i>	0	1	0
Presentation at delivery	Vertex	86 (72)	51 (61)	13 (87)
	Breech	32 (27)	31 (37)	2 (13)
	Compound	1 (1)	2 (2)	0 (0)
	Brow	0 (0)	0 (0)	0 (0)
	Face	0 (0)	0 (0)	0 (0)
	<i>Missing</i>	0	1	0

^aPercentages are calculated after removing missing values

^bSecond and subsequent deaths from pregnancies with multiple losses are excluded

Table 4
Post mortems (PM) for stillbirths and neonatal deaths whose mothers were resident in Northern Ireland: 2009.

	n (%) ^a	
	Northern Ireland	England, Wales, Northern Ireland and the Crown Dependencies
Stillbirths		
PM held	66 (55)	1723 (48)
PM reports received at CMACE	49 (41)	1437 (40)
PM was not offered	10 (8)	104 (3)
No consent given for PM	43 (36)	1749 (49)
Not known	0	236
Neonatal deaths		
PM held	24 (25)	640 (32)
PM reports received at CMACE	19 (20)	510 (25)
PM was not offered	18 (19)	263 (13)
No consent given for PM	55 (57)	1115 (55)
Not known	3	326

^aPercentages are calculated after removing missing values

Figure 1
Birth weight and gestational age distribution of stillbirths whose mothers were resident in Northern Ireland: 2009.

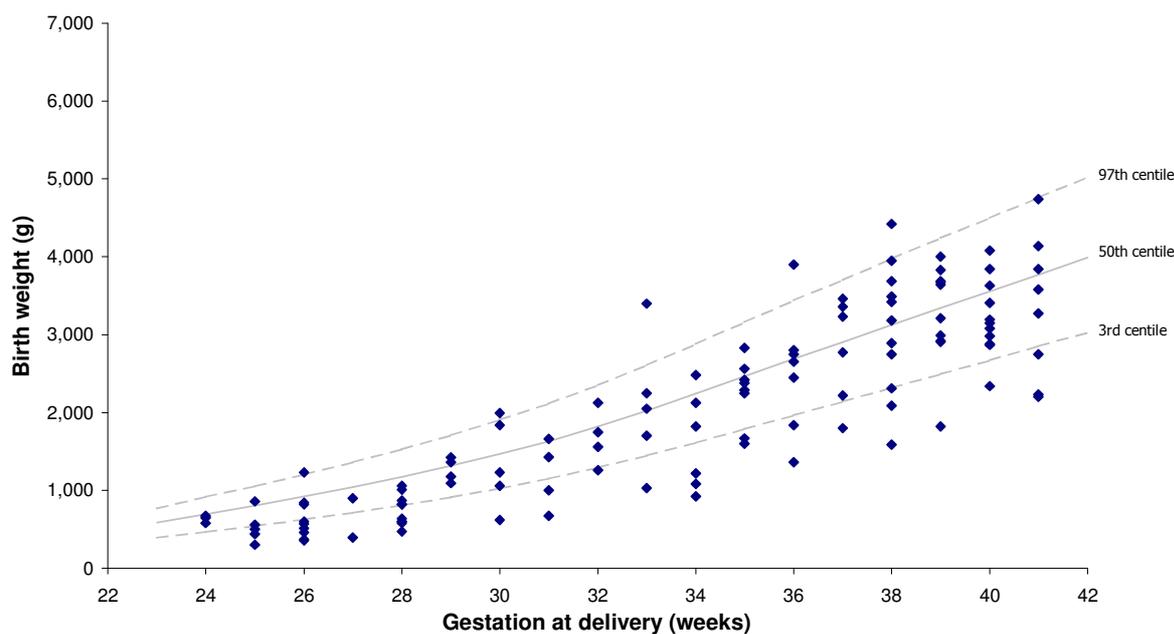


Figure 2
Birth weight and gestational age distribution of neonatal deaths whose mothers were resident in Northern Ireland: 2009.

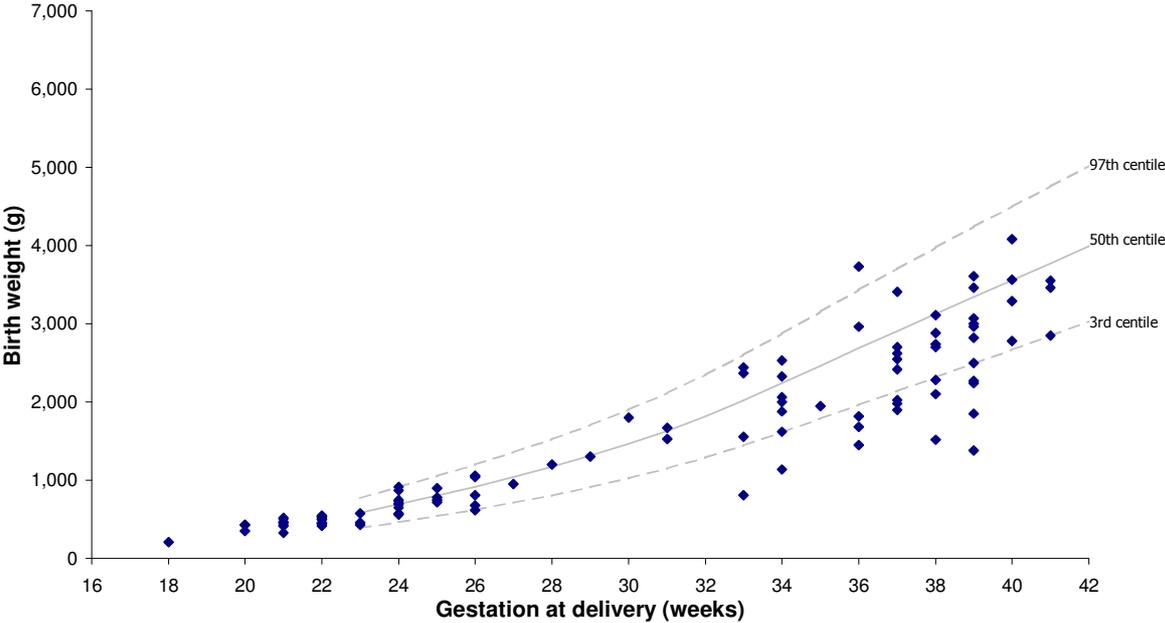


Figure 3
Percentage distribution of main causes of stillbirths whose mothers were resident in Northern Ireland: 2009 (excluding terminations of pregnancy).

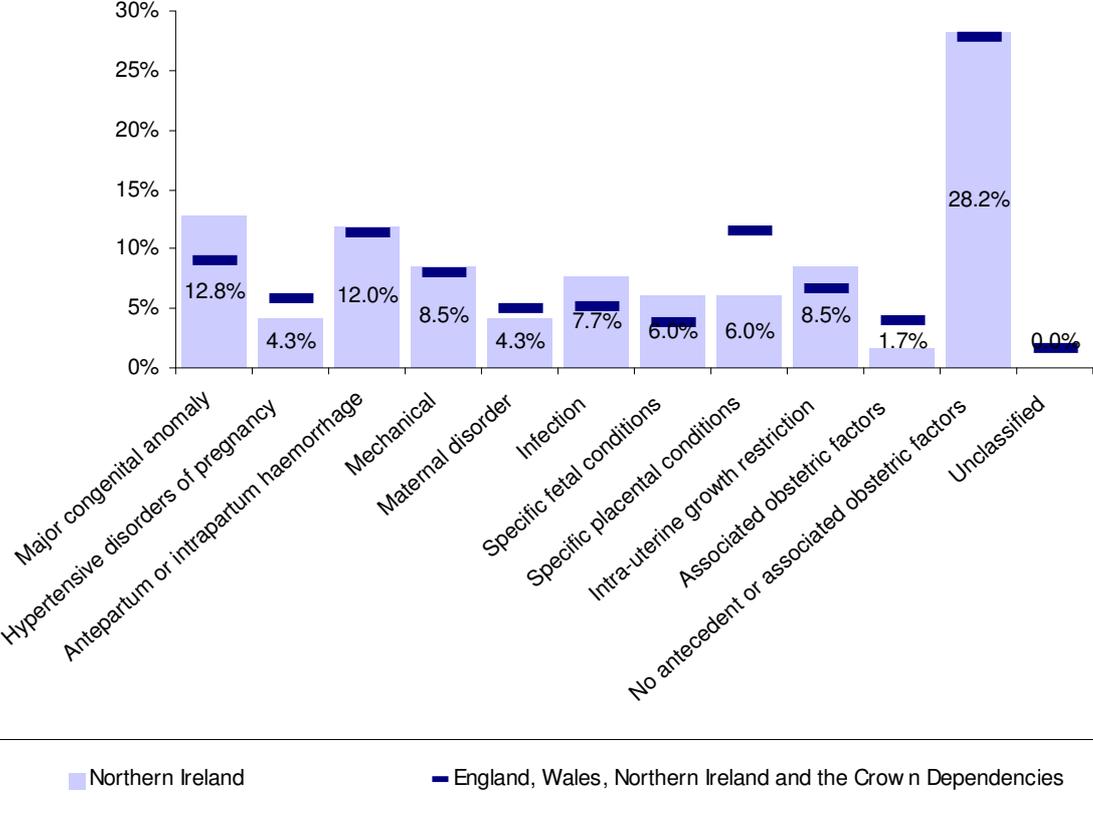


Figure 4
Percentage distribution of main causes of neonatal deaths whose mothers were resident in Northern Ireland using the maternal and fetal classification: 2009 (excluding terminations of pregnancy).

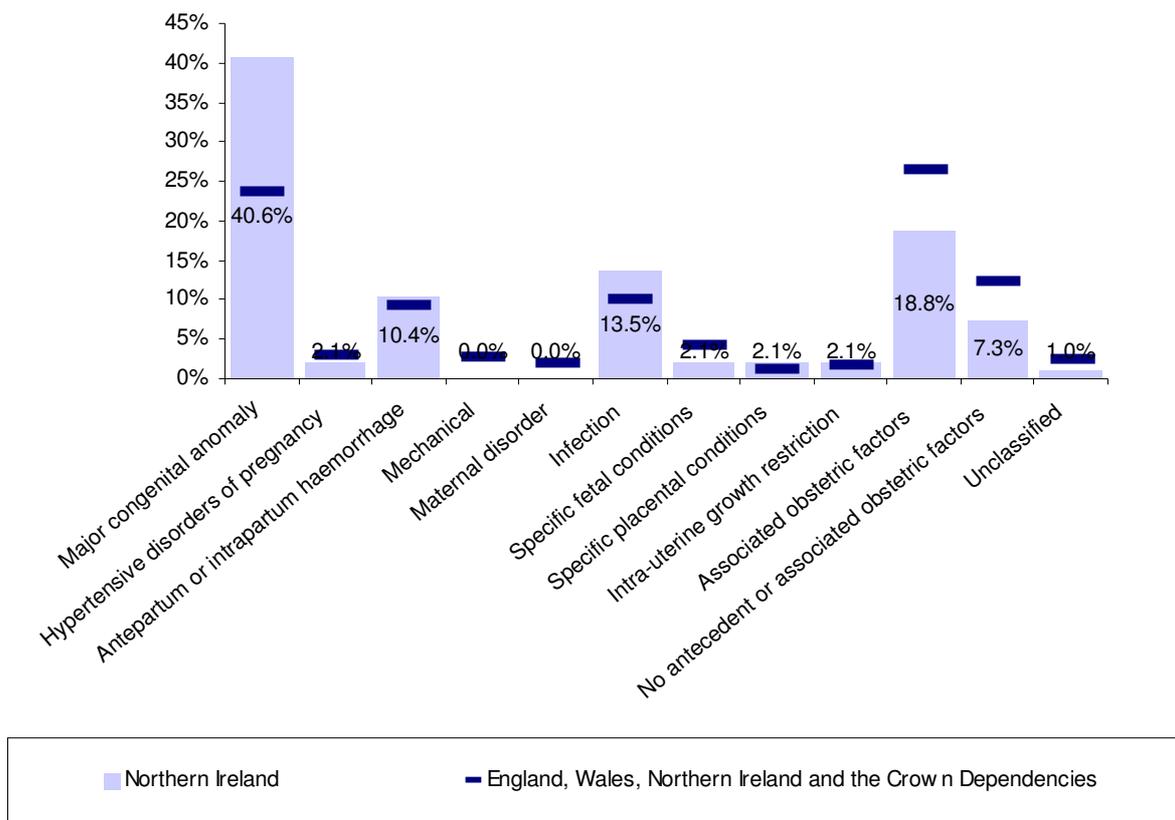


Figure 5
Percentage distribution of main causes of neonatal deaths whose mothers were resident in Northern Ireland using the neonatal classification: 2009 (excluding terminations of pregnancy).

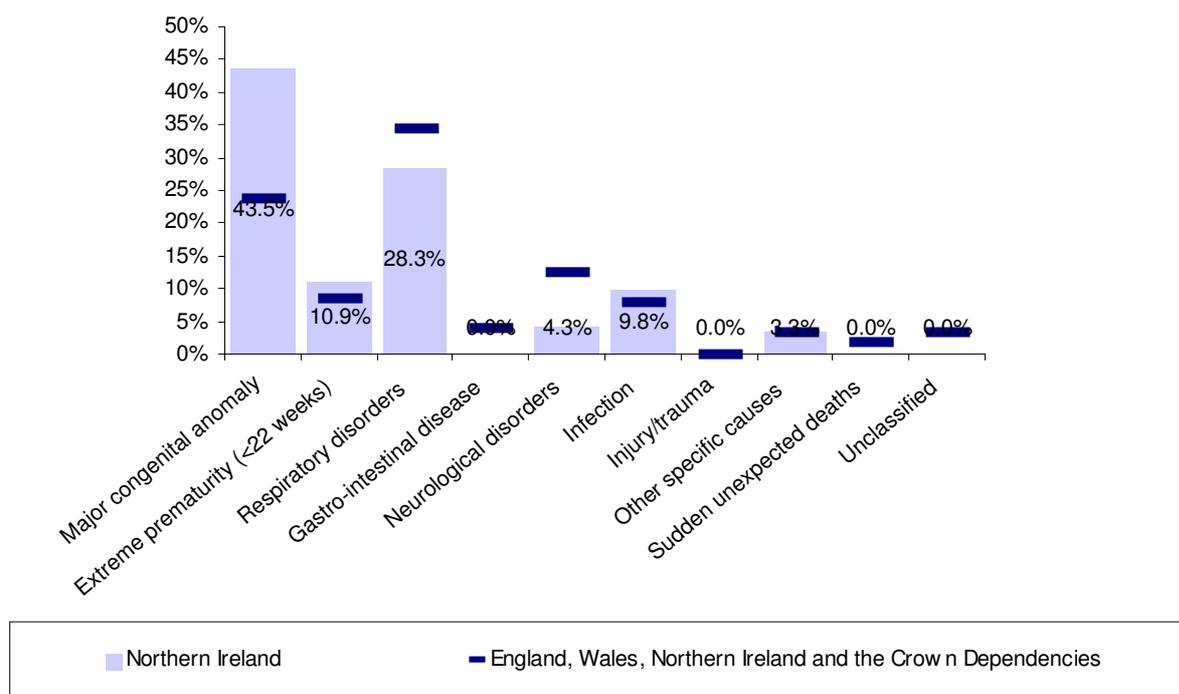
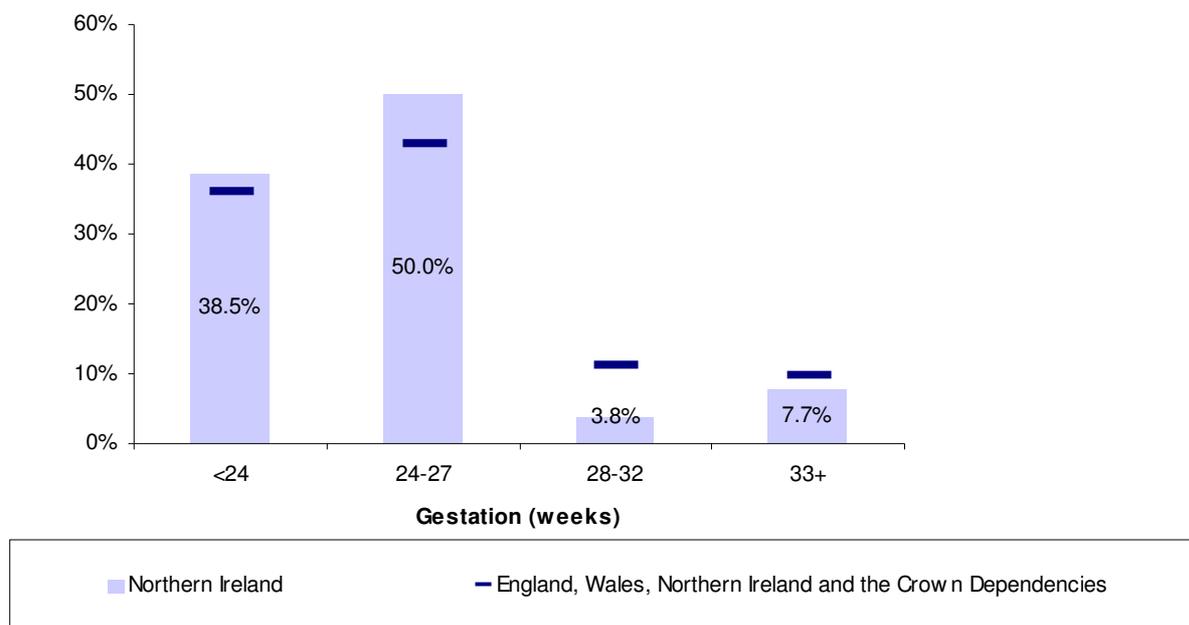


Figure 6
Percentage distribution of gestational age of neonatal deaths from respiratory disorders whose mothers were resident in Northern Ireland using the neonatal classification: 2009 (excluding terminations of pregnancy).



Section 2 Adjusted stillbirth, perinatal and neonatal mortality rates for the resident population of Northern Ireland

This section includes stillbirths and neonatal deaths whose mother's postcode lies in Northern Ireland, regardless of where they booked to deliver, delivered or died.

Table 5
Adjusted stillbirth, perinatal and neonatal mortality rates for the resident population of Northern Ireland: 2009.

	Stillbirth rate ^{a,b} [95% CI]	Perinatal mortality rate ^{a,b} [95% CI]	Neonatal mortality rate ^{a,c} [95% CI]
Northern Ireland	4.7 [3.9, 5.6]	7.5 [6.5, 8.7]	3.5 [2.8, 4.3]
England, Wales, Northern Ireland and the Crown Dependencies	4.7 [4.5, 4.8]	6.8 [6.6, 6.9]	2.8 [2.7, 2.9]

^aAdjusted by removing terminations of pregnancy and babies born at less than 22 weeks' gestation.

^bRate per 1,000 total births

^cRate per 1,000 live births

Table 6
Trends of stillbirth, perinatal and neonatal mortality rates for the resident population of Northern Ireland: 2005-2009.

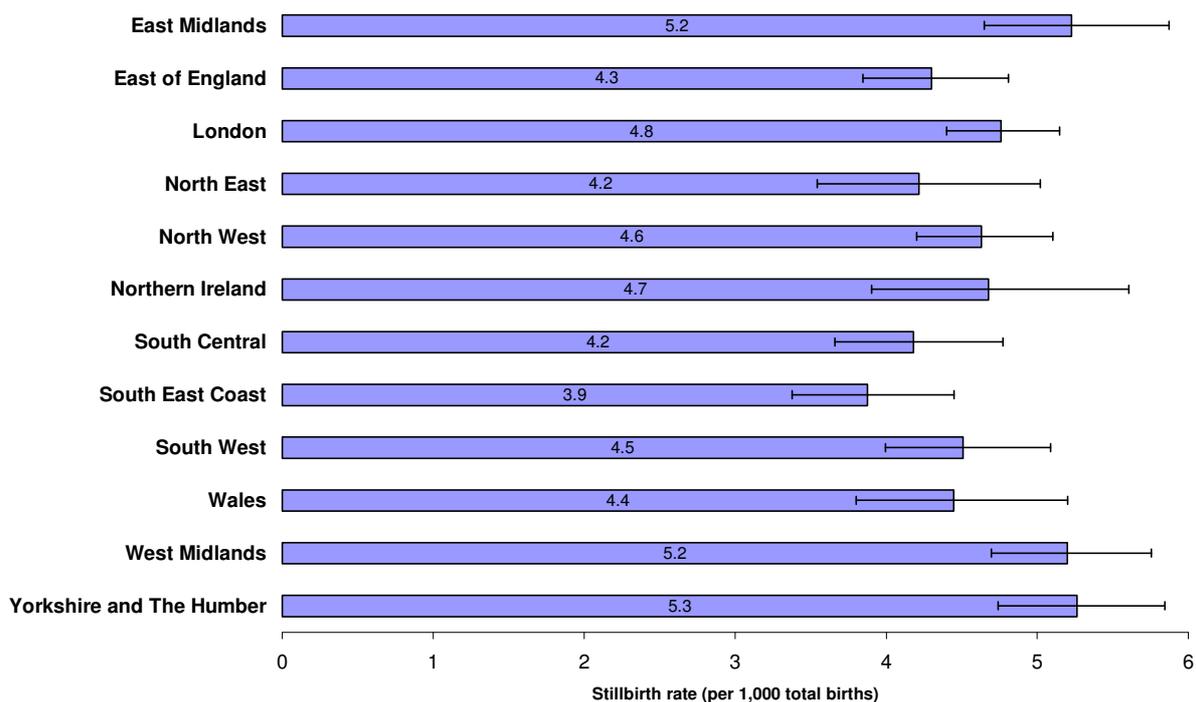
	Stillbirth rate ^{a,b} [95% CI]	Perinatal mortality rate ^{a,b} [95% CI]	Neonatal mortality rate ^{a,c} [95% CI]
2005	3.8 [3.1, 4.7]	7.0 [6.0, 8.2]	4.0 [3.3, 5.0]
2006	3.7 [3.0, 4.6]	6.3 [5.4, 7.4]	3.2 [2.6, 4.0]
2007	3.9 [3.2, 4.7]	6.2 [5.3, 7.3]	2.8 [2.2, 3.6]
2008	4.2 [3.4, 5.0]	6.4 [5.5, 7.5]	3.0 [2.4, 3.8]
2009	4.7 [3.9, 5.6]	7.5 [6.5, 8.7]	3.5 [2.8, 4.3]
Total	4.1 [3.7, 4.4]	6.7 [6.2, 7.2]	3.3 [3.0, 3.6]

^aAdjusted by removing terminations of pregnancy and babies born at less than 22 weeks' gestation.

^bRate per 1,000 total births

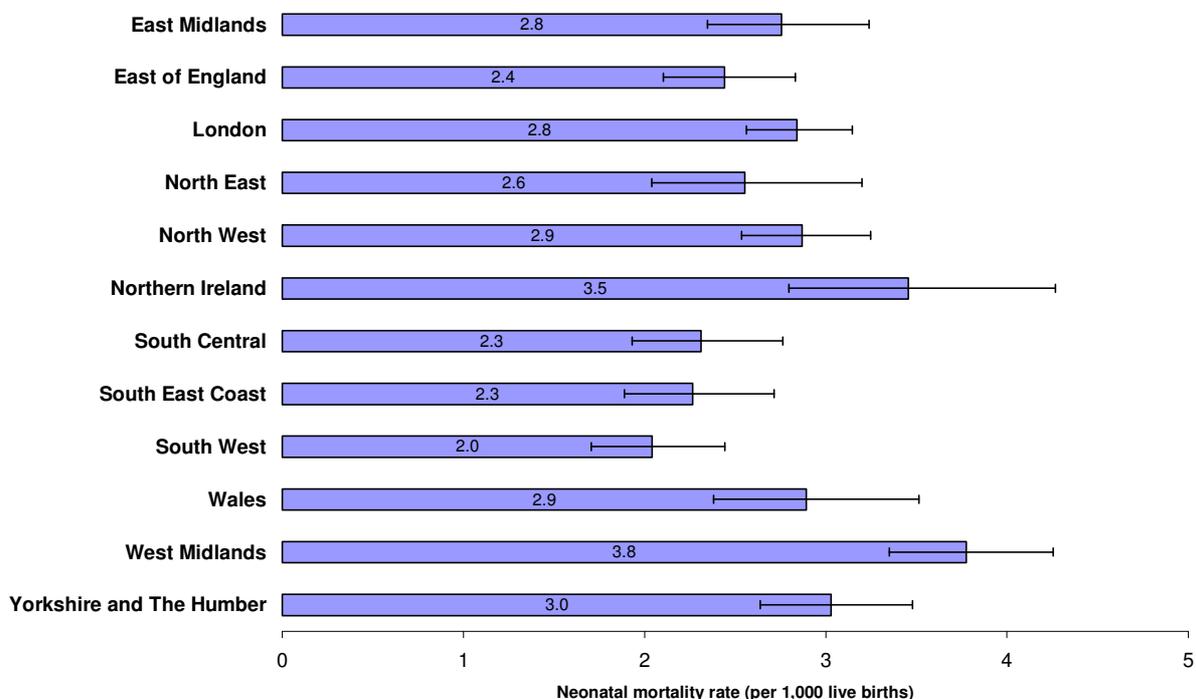
^cRate per 1,000 live births

Figure 7
Adjusted^a stillbirth rates and 95% confidence intervals for the resident population of Northern Ireland, Wales and the SHAs in England: 2009.



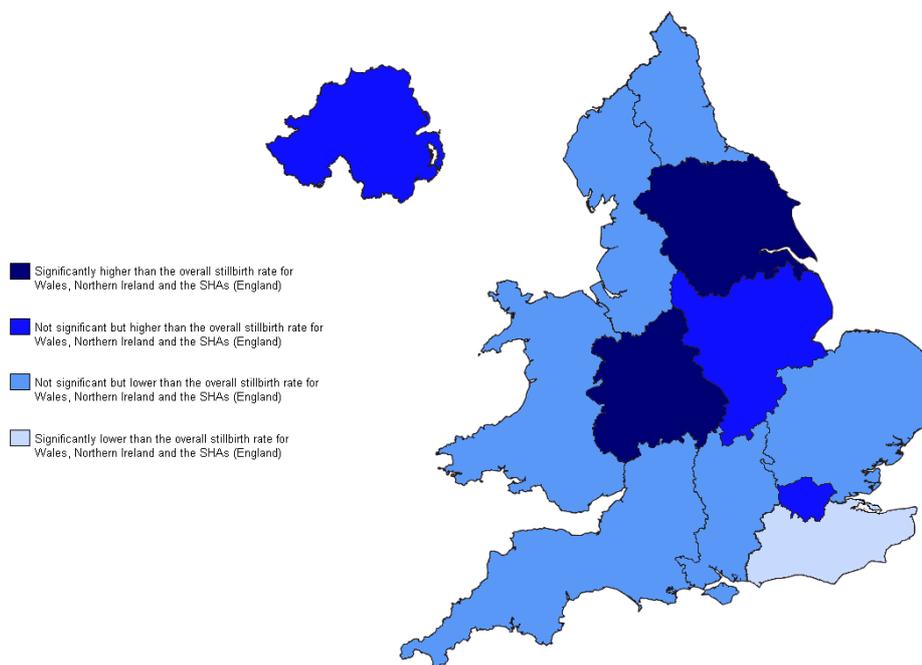
^aAdjusted by removing terminations of pregnancy and babies born at less than 22 weeks' gestation.

Figure 8
Adjusted^a neonatal mortality rates and 95% confidence intervals for the resident population of Northern Ireland, Wales and the SHAs in England: 2009.



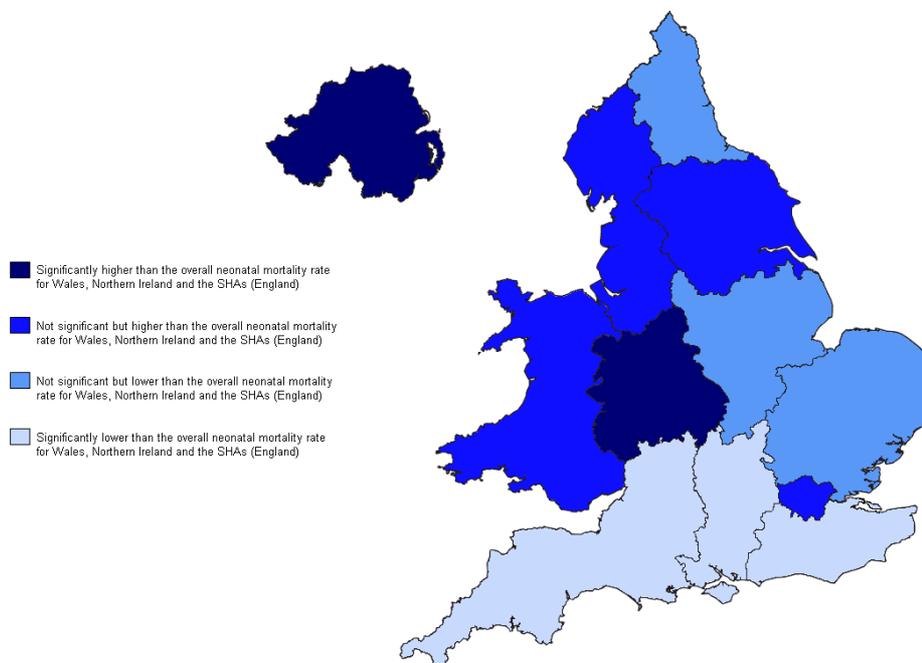
^aAdjusted by removing terminations of pregnancy and babies born at less than 22 weeks' gestation.

Figure 9
Adjusted^a stillbirth rates for the resident population of Northern Ireland, Wales and the SHAs in England: 2009.



^aAdjusted by removing terminations of pregnancy and babies born at less than 22 weeks' gestation.

Figure 10
Adjusted^a neonatal mortality rates for the resident population of Northern Ireland, Wales and the SHAs in England: 2009.



^aAdjusted by removing terminations of pregnancy and babies born at less than 22 weeks' gestation.

Section 3 Adjusted stillbirth and neonatal mortality rates for Trusts within Northern Ireland

This section includes stillbirths and neonatal deaths in a Trust located in Northern Ireland.

Table 7

Adjusted stillbirth, perinatal and neonatal mortality rates for hospitals and Trusts in Northern Ireland: 2009.

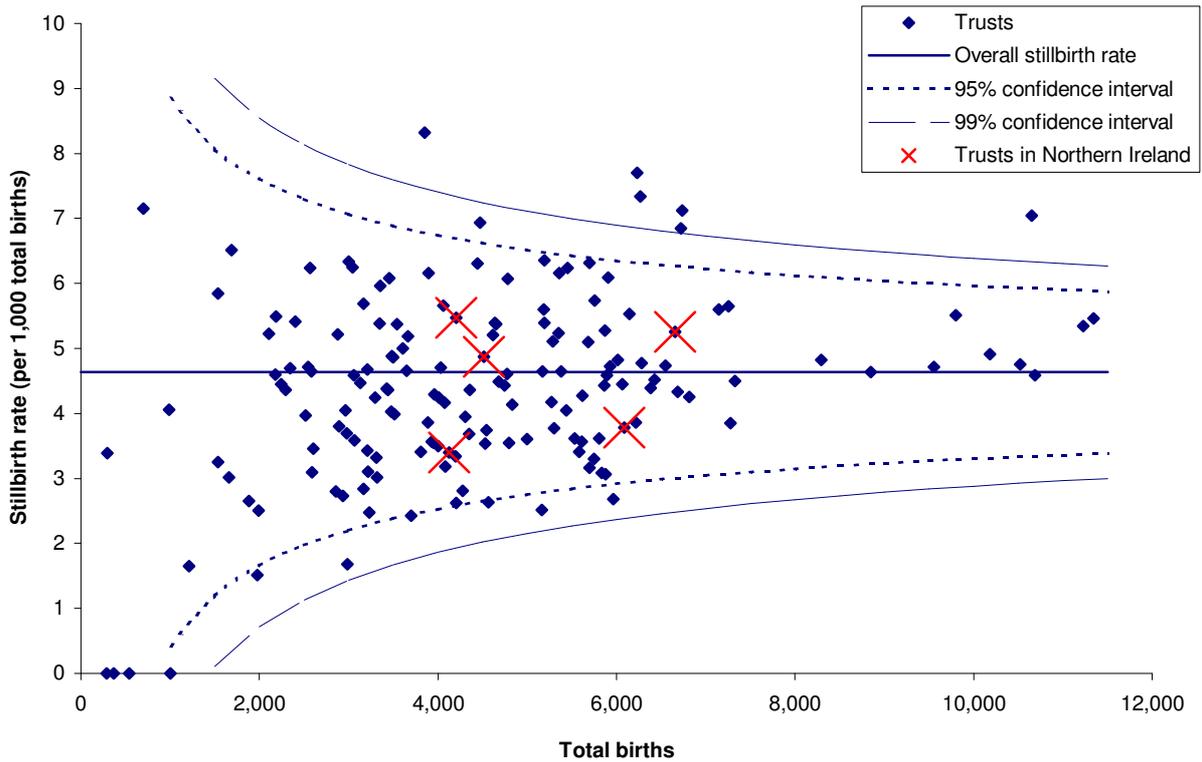
	Stillbirth rate ^{a,b} [95% CI]	Perinatal mortality rate ^{a,b} [95% CI]	Neonatal mortality rate ^{a,c} [95% CI]
Belfast Health and Social Care Trust	5.3 [3.8, 7.3]	9.6 [7.5, 12.3]	5.7 [4.2, 7.9]
Mater Hospital	6.1 [2.9, 12.8]	7.9 [4.1, 15.1]	1.8 [0.4, 7.0]
Royal Belfast Hospital for Sick Children	0	-	-
Royal Jubilee Maternity Hospital	5.1 [3.5, 7.4]	9.6 [7.3, 12.6]	5.5 [3.8, 7.8]
Northern Health and Social Care Trust	5.5 [3.6, 8.2]	9.0 [6.6, 12.4]	3.8 [2.3, 6.2]
Antrim Area Hospital	5.0 [3.0, 8.4]	9.3 [6.3, 13.6]	4.3 [2.4, 7.6]
Causeway Hospital	6.5 [3.4, 12.4]	8.6 [4.9, 15.2]	2.9 [1.1, 7.7]
South Eastern Health and Social Care Trust	4.9 [3.2, 7.4]	6.2 [4.3, 9.0]	1.6 [0.7, 3.3]
Lagan Valley Hospital	3.7 [1.4, 10.0]	3.7 [1.4, 10.0]	0
Ulster Hospital	5.2 [3.3, 8.3]	7.0 [4.7, 10.4]	2.0 [1.0, 4.3]
Southern Health and Social Care Trust	3.8 [2.5, 5.7]	6.6 [4.8, 9.0]	3.1 [2.0, 4.9]
Craigavon Area Hospital	3.1 [1.7, 5.4]	6.7 [4.5, 9.8]	3.9 [2.3, 6.4]
Daisy Hill Hospital	5.0 [2.8, 9.1]	6.4 [3.8, 10.8]	1.8 [0.7, 4.9]
Western Health and Social Care Trust	3.4 [2.0, 5.7]	5.1 [3.3, 7.8]	2.2 [1.1, 4.2]
Altnagelvin Area Hospital	3.2 [1.7, 6.1]	5.3 [3.2, 8.8]	2.8 [1.4, 5.7]
Erne Hospital	3.8 [1.6, 9.2]	4.6 [2.1, 10.3]	0.8 [0.1, 5.5]

^aAdjusted by removing terminations of pregnancy and babies born at less than 22 weeks' gestation.

^bRate per 1,000 total births

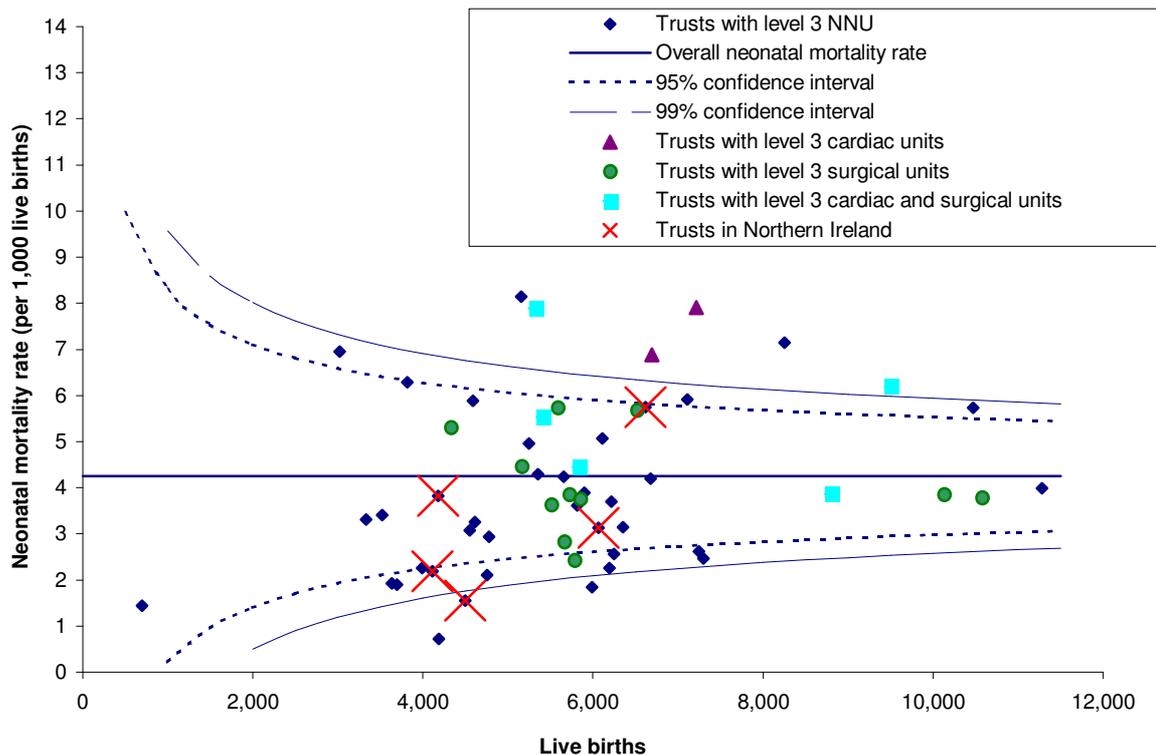
^cRate per 1,000 live births

Figure 11
Adjusted^a stillbirth rates compared to the overall stillbirth rate and associated 95% and 99% confidence intervals for Trusts in Northern Ireland; England, Wales, Northern Ireland and the Crown Dependencies: 2009.



^aAdjusted by removing terminations of pregnancy and babies born at less than 22 weeks' gestation.

Figure 12
Adjusted^a neonatal mortality rates compared to the overall neonatal mortality rate and associated 95% and 99% confidence intervals for Trusts with level 3 neonatal units; England, Wales, Northern Ireland and the Crown Dependencies: 2009.

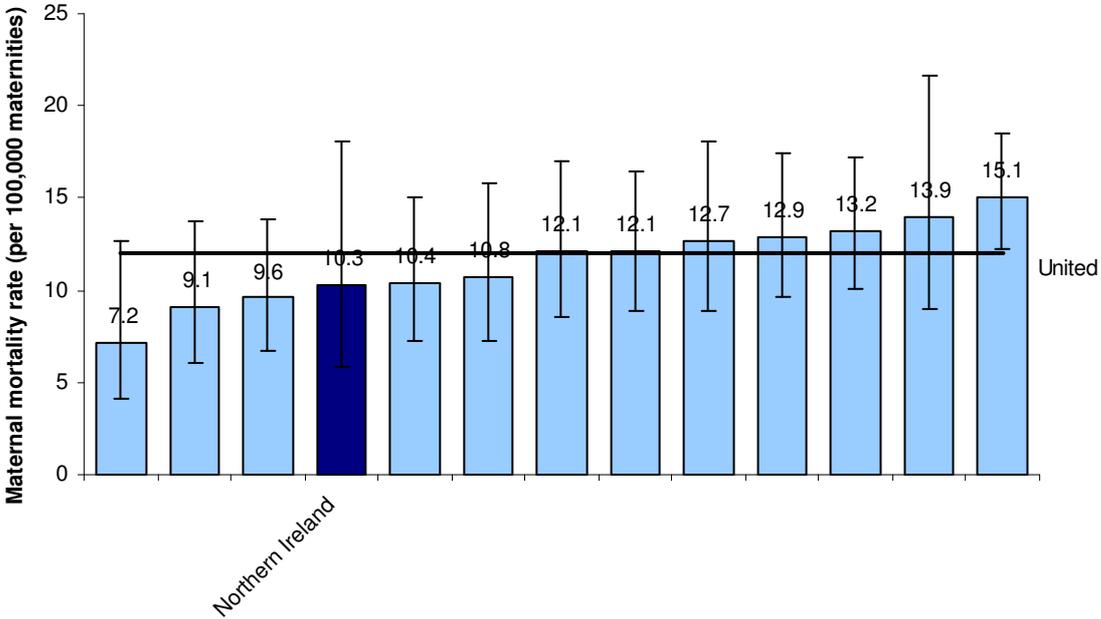


^aAdjusted by removing terminations of pregnancy and babies born at less than 22 weeks' gestation.

Section 4 Maternal mortality rates for the residents in Northern Ireland

This section includes maternal deaths whose postcode lies in Northern Ireland.

Figure 13
Maternal mortality rate for Northern Ireland, Scotland, Wales and the SHAs in England: 2004-2008.



For one death between 2004 and 2008, SHA of residence is not known as the postcode is missing.