

TWIN PREGNANCY AND NEONATAL CARE IN ENGLAND

A TAMBA REPORT - NOVEMBER 2017

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A report by the Twins And Multiple Births Associations (TAMBA) with a foreword from BLISS and SANDS

Tamba
TWINS & MULTIPLE BIRTHS ASSOCIATION

FOREWORD

Caroline Lee-Davey, BLISS

Bliss exists to give every baby born premature or sick in the UK the best chance of survival and quality of life, and we recognise the unique needs and challenges facing those with multiple pregnancies. Evidence has long shown that multiple pregnancies carry greater risk of stillbirth, neonatal admission and neonatal death - but that doesn't mean we should accept this as a fact we cannot change.

This new report from Tamba highlights examples of the best-performing neonatal networks where significantly better outcomes for multiples are being achieved; as well as, more troublingly, those areas where outcomes for multiple pregnancies are significantly worse than the national average. In light of the many strands of work currently aimed at improving outcomes in maternity and neonatal care - including the Maternity Transformation

Programme, the Neonatal Transformation Review and the Maternity & Neonatal Safety Collaborative - this report reinforces the need to ensure that each one of these programmes includes a specific focus on multiple pregnancies to deliver consistent and sustained improvements in care for these babies and their families.

Bliss is committed to working alongside Tamba to seek positive change and service improvements to help to address some of the inequalities in outcomes highlighted in this important report.

Caroline Lee-Davey
Chief Executive
BLISS

Bliss
for babies born
premature or sick

Foreword continued ►

Clea Harmer, SANDS

This significant report from Tamba highlights key information relating to multiples and perinatal death and neonatal admission. It is clear that, in striving to reduce perinatal mortality rates, there must be improved focus and attention on multiples; ensuring care is improved to optimal levels across the UK and that all reporting on multiples occurs separately. The importance of a robust review into each stillbirth and neonatal death will contribute to a better understanding of the specific issues for multiples, and the new Perinatal Mortality Review Tool will provide an invaluable opportunity to do this. But the report also underlines the fact that further research is needed for a better understanding of the factors that

contribute to the higher perinatal death rates for multiples.

The death of a baby before, during or shortly after birth is a devastating and tragic event. Sands welcomes this report and the opportunities it offers to identify actions to decrease perinatal mortality rates; we are committed to working with Tamba to continue this important work.

Clea Harmer
Chief Executive
SANDS



Keith Reed, TAMBA

Our thanks to all those partner organisations helping to address many of the issues identified in this report. Together we are working across 18 projects aimed at reducing stillbirths, neonatal admissions, neonatal deaths and improving birth outcomes in multiple pregnancies. These are listed in more detail at www.tamba.org.uk/blog/partofthesolution. This report will be shortly followed by an update on our Department of Health funded maternity engagement programme with insights into the difficulties units commonly face in delivering the best care possible and tools kits to overcome them. This update will be issued in early 2018. If you would like

to receive a copy, please register your interest by emailing support-team@tamba.org.uk

Finally, we look forward to the national partners identified in this report continuing to support these collective efforts by taking action where appropriate.

Keith Reed
Chief Executive
TAMBA



Graphs and Tables

Graph 1

Multiple and singleton stillbirth rates between 2003 and 2014

Graph 2

Multiple and singleton neonatal death rates between 2003 and 2013

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Total multiple births (ranking) of total multiple births, stillbirths and neonatal deaths by neonatal network (NN)

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Neonatal Networks ordered by cohort size and compared by neonatal admissions and neonatal death rate



SUMMARY REPORT

Rates of stillbirth and neonatal deaths seem to have reduced but still remain higher compared to rates in other high-income countries. According to the latest 2015 MBRRACE surveillance report, the rate of extended perinatal mortality in the UK has decreased from 6.04 to 5.61 deaths per 1,000 total births over the period 2013 to 2015. However, there has been only a small decrease in the rate of neonatal mortality from 1.84 to 1.74 deaths per 1,000 live births. Multiple pregnancies are about 2.5 times more likely to result in a stillbirth and over 5 times more likely to result in a neonatal death, in comparison to singleton pregnancies. While multiple births account for an average of 3.12% of total births, they are accountable for a much larger portion of all perinatal mortalities, an average of 9.79%.

Methods and Objectives

The objective of this Tamba report is to provide information on multiple birth perinatal deaths and to highlight the important indicators related to multiple birth mortality rates presented by Neonatal Networks (NN) across England.

Based on national data provided by the Office of National Statistics (ONS), the National Neonatal Research Database (NNRD), the NHS National Reporting and Learning System (NRLS) and the Tamba maternity survey, the main objectives of this report were to explore:

- The time trends in rates of stillbirth and neonatal deaths in multiple pregnancies compared to singleton pregnancies within a ten-year period in the UK.
- The rates of admissions to neonatal care and recorded patient safety incidents by NN.
- The overall compliance of each Neonatal Network to the NICE guidelines and its influence on stillbirths and neonatal admissions.
- The influence of patient care provided by specialists on positive satisfaction rates.
- The influence of the number of multiple pregnancies within a NN on perinatal mortality rates.
- The number of reduced admissions to neonatal care if networks had the lowest admission rate.
- The number of baby lives that would be saved if networks had the lowest neonatal and stillbirth rates.

Analysis

The main findings of the report are represented mainly in time trend graphs and tables showing the mortality rates for stillbirths and neonatal deaths. For comparison

purposes the mortality rates for individual networks are presented compared to the UK averages. The data sets are presented by Neonatal Network across the UK.

Key Findings

- Multiple births across UK regions demonstrate higher rates of both stillbirth (average 1.11%) and neonatal death (average 1.15%), in comparison to singleton pregnancies (0.43% and 0.22% respectively).
 - Admission to neonatal care is positively related with patient safety incidents.
 - Greater levels of compliance with antenatal guidelines relate to lower rates of stillbirths but don't influence neonatal admissions.
 - Patient care provided by specialists is positively related to positive patient satisfaction rates.
 - Smaller cohorts of multiple pregnancies may result in poorer care, patient satisfaction and outcomes.
 - Admissions to neonatal care would be reduced by 3,067 per year if all neonatal networks had the lowest admission rate (25%).
 - 420 baby lives would be saved every year if all neonatal networks had the lowest stillbirth (0.16) and neonatal death (0.44) rates.
 - For future research and quality improvement programmes, it is interesting to note that as a general trend, in most cases, the MBRRACE national perinatal death audit's overall perinatal morbidity ranking, correlates fairly closely with rates of admission to neonatal care ranking. Office of National Statistics (ONS) multiple birth perinatal morbidity correlate fairly closely with the ranking of Neonatal Network's by patient safety incident.
- The findings of this review should be interpreted with some caution. This review reported only crude mortality rates, which could be misleading when highlighting networks where the mortality rate is higher than expected due to variation in the quality of care. It could also be the case that the number of perinatal deaths for many networks is likely to be small, because these deaths are rare, and there may be more deaths in some years than in others due to chance. This could potentially lead to large fluctuations in the crude mortality rates. Another reason for a large variation between networks could be the socio-economic status in certain areas. Socio-economic deprivation in some areas can influence mortality

rates even when high quality maternity and neonatal care is offered. In addition, the self-reported NICE compliance and patient satisfaction data could be

subject to recall bias. The caseload treated in some areas maybe very different and therefore may influence the outcome data too.

Recommendations

1. Based on the rates of specific indicators which could determine performance within Neonatal Networks (NN), the implementation of the 'NICE Multiple Pregnancy: antenatal care for twin and triplet pregnancies clinical guideline' (CG129) by all maternity units, seems to be essential.
2. A better understanding of the causes of preterm birth and the development of interventions to prevent preterm birth are therefore urgently needed if we would like to see a sustained reduction in the rates of perinatal deaths and in particular neonatal deaths. In addition, a 2006 analysis on the public costs due to preterm births, seems to suggest that reducing prematurity by even one week could save the public purse £112m-£153m. Research institutions needs to continue prioritising investment in this area. NHS England's neonatal transformation review needs to look at identifying the most successful network wide pathways covering both maternity and neonatal care for more complex pregnancies like multiples and seek to replicate good practice elsewhere.
3. NHS England and NHS Improvement should look to extend their efforts in trying to reduce term neonatal admissions to include reducing avoidable admissions in multiple pregnancies starting with the neonatal networks with the highest admission rates.
4. NHS England need to ensure the benefits of adherence to NICE guidelines and good intrapartum care in multiple pregnancies clearly feature in the stillbirth care bundle updates.
5. NHS England need to ensure Local Maternity Systems demonstrate the minimum number of multiple pregnancies that need to be treated in their area, or in individual's units, to provide safe, satisfactory care and how this has been considered.
6. The maternity and neonatal safety collaborative should consider how to incorporate improving outcomes in multiple pregnancies as part of their work streams.
7. The forthcoming perinatal mortality review tool needs to be used to ensure a more detailed understanding of these differences.

FULL REPORT

Background

Whilst rates of stillbirth and neonatal deaths appear to have reduced, they remain higher compared to rates in other high-income countries. According to the latest 2015 MBRRACE surveillance report, the rate of extended perinatal mortality in the UK has decreased from 6.04 to

5.61 deaths per 1,000 total births over the period 2013 to 2015. However, there has been only a small decrease in the rate of neonatal mortality in the UK from 1.84 to 1.74 deaths per 1,000 live births.

Methods

Data Sources and Analysis

Data is presented by neonatal network (NN). Individual responses per trust were recorded and total scores calculated. Additionally, NN averages were calculated per indicator. The allocation guide provided mirrors the guide captured

in the 2016 MBRRACE report (MBRRACE-UK, Perinatal Mortality Surveillance Report-UK Perinatal Deaths for Births from January to December 2015).

Multiple and Singleton 'Total Births', 'Stillbirths' and 'Neonatal Deaths'

Data provided by the 'Child Health Team, Life Events and Population Sources Division' Office for National Statistics, Crown Copyright, 2016. The total number of births, stillbirths and neonatal deaths were calculated for multiple pregnancies

in 2014. Averages were calculated and weighted per neonatal network size (tables 1 & 4).

Methods continued ►

‘Multiple Birth Neonatal Admissions’

Data provided by the National Neonatal Research Database (NNRD) (April 2016) and the total number of infant admissions (as the

first recorded episode of neonatal care in 2014) was calculated (tables 2 & 3).

‘NICE Compliance’ and ‘Patient Satisfaction Data’, ‘Tamba Maternity Survey’ (data collected between August 2013 - August 2014)

In total 977 respondents who had given birth to multiples, between August 2011 and August 2014, were included in the analyses. Self-reported NICE compliance and patient feedback were estimated per neonatal network (tables 5 & 6). For the patient feedback patients responded on a 5-point Likert scale ranging from "Poor" to "Very Good"

and rated satisfaction levels in conjunction with antenatal and postnatal care provided. For the NICE compliance questionnaire respondents had to state ("Yes", "No", "Don't know") whether they received the standard treatment for multiple pregnancies by the treating hospital.

‘Patient Safety Incident Data’

Data provided by the NHS National Reporting and Learning System (NRLS) (Jan 2016). The number of incidents recorded between 1st Jan

2005 to 31st Dec 2014 were calculated (table 2).



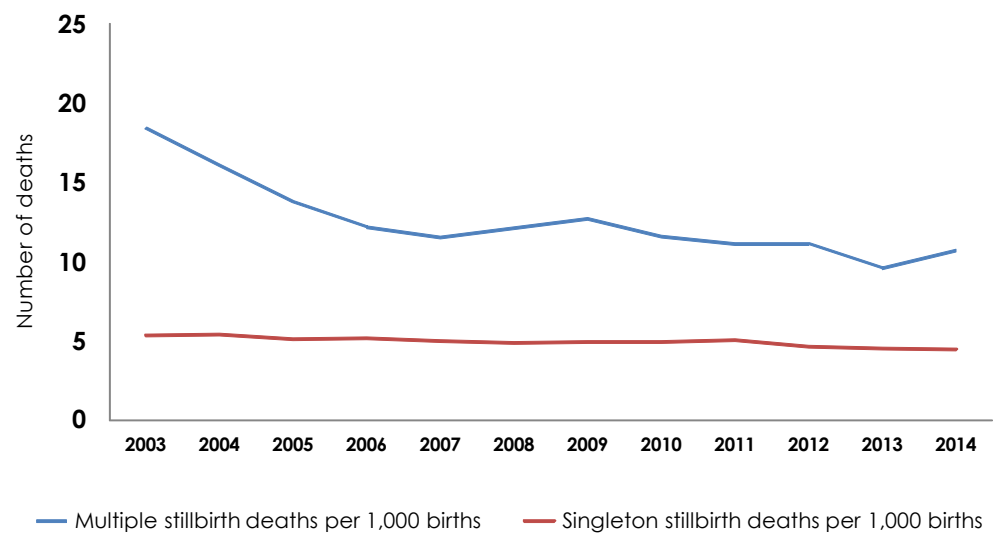
Results

1. Mortality Rates (stillbirth and neonatal deaths) in the UK

Stillbirth Deaths

Multiple and singleton stillbirth rates 2003 - 2014

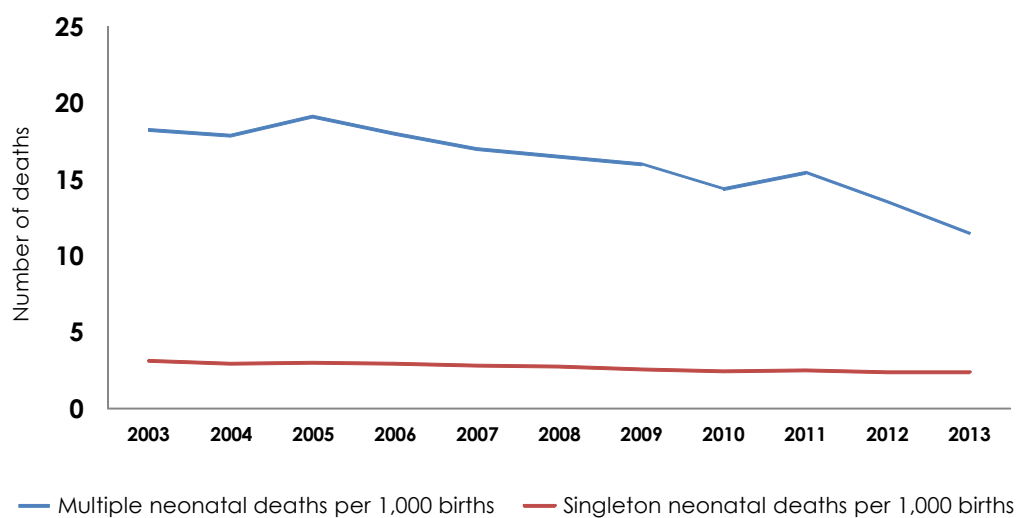
GRAPH 1



Neonatal Deaths

Multiple and singleton neonatal death rates 2003 - 2013

GRAPH 2



Results continued ►

2. Mortality Rates (stillbirth and neonatal deaths) within Neonatal Networks

Multiple births across UK regions demonstrate higher rates of both stillbirth (average 1.11%) and neonatal death (average 1.15%), in comparison to singleton pregnancies (0.43% and 0.22% respectively).

Multiple pregnancies are about 2.5 times more likely to result in a stillbirth and over 5 times more likely to result

in a neonatal death, in comparison to singleton pregnancies. While multiple births account for an average of 3.12% of total births, they are accountable for a much larger portion of all perinatal mortalities, an average of 9.79%. Table 1 shows the number of multiple pregnancy stillbirths and neonatal deaths and their ranking across Neonatal Network.

TABLE 1

Total multiple births (ranking) of total multiple births, stillbirths and neonatal deaths by neonatal network

REGION BY NEONATAL NETWORK	TOTAL MULTIPLE BIRTHS	STILLBIRTHS % (rank)	NEONATAL DEATHS % (rank)
Central	1,492	1.07 (11)	1.01 (7)
East Of England	3,667	1.85 (16)	1.64 (13)
North Central & East London	1,918	0.78 (4)	0.57 (2)
North West (Cheshire & Merseyside)	738	0.68 (2)	0.68 (4)
North West (Greater Manchester)	1,401	1.64 (14)	1.86 (14)
North West (Lancashire & South Cumbria)	596	1.01 (8)	1.51 (12)
North West London	902	1.55 (13)	0.44 (1)
Northern	1,400	0.93 (7)	0.93 (6)
South East Coast	1,729	0.81 (5)	1.27 (11)
South London	1,912	1.05 (10)	1.10 (8)
South West	2,713	1.03 (9)	0.59 (3)
Southern West Midlands	522	1.15 (12)	2.49 (16)
Staffordshire, Shropshire & Black Country	613	1.79 (15)	0.82 (5)
Thames Valley & Wessex	2,975	0.77 (3)	1.11 (9)
Trent	617	0.16 (1)	2.11 (15)
Yorkshire & Humber	2,159	0.83 (6)	1.20 (10)
TOTAL / AVERAGE	25,354	1.11	1.15

3. Admission to Neonatal Care and Recorded Patient Safety Incidents

The importance of exploring these two indicators relates to their potential relationship with stillbirth and neonatal death rates. Finding out how these indicators are influencing perinatal morbidity rates in multiple births, may lead to important insights. This information

could inform improvement strategies, direct further research and ultimately contribute to saving the lives of many more multiple birth infants. Table 2 provides a summary of these indicators.

TABLE 2

Admissions to neonatal care and reported patient safety incidents per neonatal network (ranking)

REGION BY NEONATAL NETWORK	ADMISSION TO NEONATAL CARE % (rank)	PATIENT SAFETY INCIDENTS (rank)
Central	30.29 (4)	9.12 (4)
East Of England	33.65 (7)	10.20 (6)
North Central & East London	26.17 (2)	8.97 (3)
North West (Cheshire & Merseyside)	53.25 (13)	11.79 (8)
North West (Greater Manchester)	41.18 (10)	17.13 (13)
North West (Lancashire & South Cumbria)	32.89 (6)	15.27 (12)
North West London	34.48 (8)	14.41 (11)
Northern	32.71 (5)	9.21 (5)
South East Coast	45.86 (12)	12.55 (10)
South London	26.52 (3)	11.87 (9)
South West	34.61 (9)	6.86 (2)
Southern West Midlands	88.31 (16)	21.26 (15)
Staffordshire, Shropshire & Black Country	65.58 (15)	19.74 (14)
Thames Valley & Wessex	24.57 (1)	6.59 (1)
Trent	58.51 (14)	23.01 (16)
Yorkshire & Humber	45.39 (11)	11.39 (7)
TOTAL / AVERAGE	36.67	13.09

Based on the data trends of the admission to neonatal care across the networks, it was estimated that 3,067 admissions to neonatal care

could be reduced if all neonatal networks had the lowest admission rate (25%) (table 3).

TABLE 3

Estimated reduced admission to neonatal care based on the lowest admission rate

REGION BY NEONATAL NETWORK	ESTIMATED REDUCED ADMISSIONS
Central	85.34
East Of England	332.96
North Central & East London	30.69
North West (Cheshire & Merseyside)	211.66
North West (Greater Manchester)	232.71
North West (Lancashire & South Cumbria)	49.59
North West London	89.39
Northern	113.96
South East Coast	368.10
South London	37.28
South West	272.39
Southern West Midlands	332.72
Staffordshire, Shropshire & Black Country	251.39
Thames Valley & Wessex	—
Trent	209.41
Yorkshire & Humber	449.50
TOTAL	3,067

Results continued ►

Furthermore, we estimated that 420 baby lives would be saved every year if all neonatal networks had the

lowest stillbirth (0.16) and neonatal death (0.44) rates (table 4).

TABLE 4 Estimated number of baby lives saved based on the lowest mortality rate

REGION BY NEONATAL NETWORK	STILLBIRTH RATE (0.16)	NEONATAL DEATH RATE (0.44)
NUMBER OF LIVES SAVED		
Central	13.58	8.50
East Of England	61.97	44.00
North Central & East London	11.89	2.49
North West (Cheshire & Merseyside)	3.84	1.77
North West (Greater Manchester)	20.73	19.89
North West (Lancashire & South Cumbria)	5.07	6.38
North West London	12.54	—
Northern	10.78	6.86
South East Coast	11.24	14.35
South London	17.02	12.62
South West	23.60	4.07
Southern West Midlands	5.17	10.70
Staffordshire, Shropshire & Black Country	9.99	2.33
Thames Valley & Wessex	18.15	19.93
Trent	—	10.30
Yorkshire & Humber	14.47	16.41
TOTAL	240	181

Results continued ►

4. Overall NICE Compliance and Patient Satisfaction

TABLE 5

Neonatal Networks overall NICE compliance and patient satisfaction

REGION BY NEONATAL NETWORK	RANK BY % OVERALL NICE COMPLIANCE	RANK BY % PATIENT SATISFACTION
Central	76.74 (14)	27.52 (9)
East Of England	79.24 (9)	27.56 (8)
North Central & East London	80.21 (6)	24.59 (13)
North West (Cheshire & Merseyside)	80.36 (5)	30.61 (6)
North West (Greater Manchester)	78.57 (10)	24.30 (15)
North West (Lancashire & South Cumbria)	86.61 (2)	31.82 (4)
North West London	73.06 (16)	24.72 (12)
Northern	80.04 (8)	36.65 (1)
South East Coast	78.37 (11)	26.49 (11)
South London	80.51 (4)	24.36 (14)
South West	77.56 (2)	32.94 (2)
Southern West Midlands	89.11 (1)	27.51 (10)
Staffordshire, Shropshire & Black Country	80.18 (7)	22.61 (16)
Thames Valley & Wessex	77.25 (13)	32.24 (3)
Trent	80.95 (3)	30.67 (5)
Yorkshire & Humber	75.29 (15)	29.59 (7)

Ranking among Neonatal Networks

In terms of the achieved ranks for the admission to neonatal care and patient safety incidents, the number one ranking NN for admission to neonatal care and patient safety incidents was Thames Valley and Wessex. The worst performing on admission to neonatal care was Southern West Midlands and on patient safety incidents was Trent. However, Southern West Midlands achieved the best ranking in terms of compliance with the NICE guidelines.

Below are brief case studies, highlighting the key facts of some of the best and worst performing Neonatal Networks. These cases were selected because they

present particular points of interest. Nevertheless, all networks need to look at how care in multiple pregnancies is being delivered. There may be other reasons such as the ethnicity, socioeconomic status and cultural beliefs of the local population or a particularly specialised fetal medicine centre within the network, which cares for particularly high-risk pregnancies that may influence the outcomes recorded. As such, these results provide a high-level snap shot review but greater consideration is required at a trust and individual unit level.

Individual Cases of Interest - Worst Performing

Some of the worst overall performing Neonatal Networks were; Staffordshire, Shropshire and Black Country, North West (Greater Manchester), Trent and Southern West Midlands.

North West (Greater Manchester) had a below average number of multiple births at 2.96% (average 3.12%) and yet the contribution of multiple births to the overall mortality rate was the second worst at 12.56% (average 9.79%). Multiple birth stillbirths and neonatal deaths were the 3rd worst rates of all neonatal networks at 1.64% (average 1.11%), and 1.86% (average 1.15%) respectively. Overall NICE compliance was 78.57% (average 80.15%; based on patients' satisfaction ratings). Patient safety incidents were elevated at 17.13% (average 13.09%).

Southern West Midlands had the third lowest average rate of multiple births of 2.69% (average 3.12%), and the smallest cohort at only 522 infants. Regardless of this, the multiple births contributed to 10.27% (average 9.79%) of overall mortalities. Stillbirths were slightly elevated at 1.15% (average 1.11%), but neonatal deaths were the highest of all the neonatal networks at 2.49% (average 1.15%). This means multiples born in this neonatal network area were more than twice as likely than average, to result in a neonatal death. Singleton mortality rates were also raised. The overall extended perinatal death rate was 0.671 (average 0.605) as published in the MBRRACE 2014 report. The differing data sources concur, confirming this area to have the joint worst overall perinatal mortality rate of all, along with Yorkshire and Humber. Admission to

neonatal care was also the worst of all the neonatal networks at an alarming 88.13%, over double the average 36.67%. This means around 461 of the tiny cohort of only 522 multiple birth infants, ended up admitted to neonatal care.

Trent came up third worst performing Neonatal Network, when rated only by the 4 key indicators. This is another example of a very small cohort (617), with similarities to the two NN's with similarly small cohort size (southern West Midlands and Staffordshire, Shropshire and Black Country). One incidence these small cohorts seem to have in common is particularly high neonatal admissions, Trent being the third worst at 58.51% (average 36.67%). Alongside neonatal admission, coincided a high neonatal death rate of 2.11%, the second worst (average 1.15%).

The East of England had a slightly elevated rate of multiple births at 3.15% (average 3.12%) and was the largest cohort of all at 3,667. The contribution of multiple births to the overall mortality rate was 15.59% (average 9.79%), the highest rate of all the NN's. However, this may be partially explainable by the general tendency for multiples to be higher risk, combined with the large cohort size and higher than average multiple birth rate. The stillbirth rate was the highest of all NN's at 1.85% (average 1.11%) and neonatal deaths were also raised at 1.64% (average 1.15%). Conversely mortality rates for singletons were some of the lowest. Despite the high stillbirth rate NICE compliance was rated relatively high 79.24% (average 80.15%).

Staffordshire, Shropshire and Black Country was the single overall worst performing neonatal network based on key indicators and when including perinatal mortalities. It had a lower than average rate of

multiple births of 2.82% (average 3.12%), and the second smallest cohort of only 613 multiple birth infants. Contribution of multiple births to overall mortality was below average at 8.74% (average 9.79%). The overall extended perinatal death rate for multiple and singletons, was the third worst 0.654 (average 0.605) (MBRRACE 2014). Multiple neonatal deaths were also low at 0.82% (average 1.15%) and yet admission to neonatal care was the second highest with 65.58%, (average 36.67%). Logically this high admission to neonatal care may have saved some tiny lives and brought down the neonatal death rate, yet for such a large proportion of a tiny cohort to need neonatal care at all, is still of concern and warrants further investigation. Stillbirth rates were unusually high (second highest) at 1.79% (average 1.11%). However, overall NICE compliance was near the mean rate for this NN (80.18%). As the tables above summarise, this NN also performed badly by patient safety incidents, and had poor levels of patient satisfaction.

Ranking among
Neonatal Networks ►
continued

Individual Cases of Interest - Best Performing

The best performing Neonatal Networks were consistent whether taking into account just the key indicators, or when also including mortality rates. These were: Northern, North Central and East London, and North West (Cheshire and Merseyside).

Northern was the single overall best performing Neonatal Network whose success seems to stem from having fairly good scores across all factors. Patient safety incidents were 9.21% (average 13.09%), admission to neonatal care was 32.71% (average 36.67%), stillbirths were 0.93% (average 1.11%), neonatal deaths were 0.93% (average 1.15%) and contribution of multiples to total mortality was 9.06% (average 9.79%). All of these factors were better than average, and with no single factor performing poorly. NICE score for specialist midwife was the highest 67.07% (average 58.34%).

North Central and East London was the second overall best performing NN, a particularly impressive feat when considering one of the highest multiple birth rates of 3.48% (average 3.12%). Despite the high percentage of multiple births, the contribution of multiples to total mortalities was third lowest of all at 7.54% (average 9.79%). Stillbirths 0.78% (average 1.11%) and patient safety incidents 8.97% (average 13.09%), were all better than average. Neonatal deaths 0.57% (average 1.15%), and neonatal admissions 26.17% (average 36.67%) were the second best of all. The NICE compliance score was higher than the average (80.21%, average 80.15%) but patient satisfaction was low 24.59% (average 28.82%).

North West (Cheshire and Merseyside) also performed well, with majority of factors better than

average. These included the lowest contribution of multiples to overall mortality rate at 5.29% (average 9.79%) and second best stillbirth rate 0.68% (average 1.11). Other factors performed reasonably across the board; neonatal death rate 0.68% (average 1.15%), patient safety incidents 11.79% (average 13.09%), NICE compliance 80.36% (average 80.15) and patient satisfaction 30.61% (average 28.82%). However, the one factor that did not follow the same trend was neonatal admissions, which was particularly high at 53.25% (average 36.67%). This was despite the second lowest multiple birth rate of 2.67% (average 3.12%) and a small cohort of 738.

This relationship between small cohort size and admission to neonatal care (in both good and poorly performing NN's it seems) is explored next.

Ranking among
Neonatal Networks ►
continued

TABLE 6

Multiple birth Neonatal Network data for stillbirths and neonatal deaths compared with MBRRACE findings

REGION BY NEONATAL NETWORK	RANK HIGHEST TO LOWEST DEATHS		MULTIPLE BIRTHS 2014 ONS			MBRRACE 2014 BY NEONATAL NETWORK (ALL BIRTHS)		
	ONS	MBR	Perinatal Deaths	Stillbirths	Neonatal Deaths	Perinatal Deaths	Stillbirths	Neonatal Deaths
Southern West Midlands	16	16	3.64	1.15	2.49	0.671	0.431	0.234
North West (Greater Manchester)	15	11	3.50	1.64	1.86	0.636	0.434	0.186
East of England	14	5	3.49	1.85	1.64	0.557	0.415	0.147
Staffordshire, Shropshire & Black Country	13	14	2.61	1.79	0.82	0.654	0.428	0.223
North West (Lancashire & South Cumbria)	12	12	2.52	1.01	1.51	0.638	0.429	0.195
Trent	11	13	2.27	0.16	2.11	0.654	0.422	0.247
South London	10	4	2.14	1.05	1.10	0.553	0.407	0.164
South East Coast	9	3	2.08	0.81	1.27	0.548	0.415	0.140
Central	8	8	2.08	1.07	1.01	0.612	0.422	0.194
Yorkshire & Humber	7	15	2.04	0.83	1.20	0.671	0.446	0.203
North West London	6	6	2.00	1.55	0.44	0.558	0.419	0.138
Thames Valley & Wessex	5	2	1.88	0.77	1.11	0.548	0.413	0.143
Northern	4	9	1.86	0.93	0.93	0.613	0.419	0.203
South West	3	7	1.62	1.03	0.59	0.599	0.432	0.151
North West (Cheshire & Merseyside)	2	10	1.36	0.68	0.68	0.624	0.425	0.196
North Central & East London	1	1	1.36	0.78	0.57	0.537	0.405	0.149
AVERAGE	—	—	2.28	1.11	1.15	0.605	0.423	0.182

Three **HIGHEST** rates in **RED**

Three **LOWEST** rates in **GREEN**

Table 6 shows a direct comparison by Neonatal Network, between the multiple birth data only (ONS) and the overall births data (MBRRACE) for 2014. The data clearly shows agreement between multiple and overall rates, for the worst (16th) ranking Neonatal Network and the best (1st) ranking Neonatal Network for Perinatal Death Rate. However, the trend seems to end here. In fact, several comparisons show a reverse pattern. For example, the 2nd best ranked NN for multiple births, by lowest perinatal death rate (North West (Cheshire and Merseyside) was the 10th worst ranked for overall births MBRRACE reported perinatal death rate. Similarly, the 14th worst ranked NN for multiple births, by highest perinatal death rate (East of England), was the 5th best ranked for overall births MBRRACE reported perinatal death rate. However, when performing correlational tests the relationship between the ONS and MBRRACE ranks is not statistically supported.

When comparing performance across Neonatal Networks, it may be useful to take into account multiple

birth specific perinatal morbidity separately from overall perinatal morbidity. Below is a table (6) that shows this. There is a slight shuffle in rank between NN's, when taking into account overall (MBRRACE) perinatal morbidity. However, the two worst performing (Staffordshire, Shropshire & Black Country and Southern West Midlands) remain in the same bottom two ranks. North Central & East London came out as the highest performing NN, previously second placed.

As a general trend, in most cases, the MBRRACE overall perinatal morbidity ranking, correlates fairly closely with rates of admission to neonatal care ranking. Whilst ONS multiple birth perinatal morbidity correlate fairly closely with the ranking of NN's by patient safety incident.

Ranking among
Neonatal Networks ►
continued



TABLE 7

Neonatal Networks overall best performance ranked by multiple and overall perinatal morbidity, NICE compliance, admission to neonatal care and patient safety incidents

	Best Performing Neonatal Networks	MBRRACE (Adjusted Perinatal Deaths)	ONS Multiple Birth Perinatal Deaths	Rank By % Overall NICE Compliance	Rank By % Admission To Neonatal Care	Rank By % Patient Safety Incidents
1st	North Central & East London	0.537 (1)	1.36 (1)	70.53 (5)	26.17 (2)	8.97 (3)
2nd	Thames Valley & Wessex	0.548 (2)	1.88 (5)	62.16 (13)	24.57 (1)	6.59 (1)
3rd	Northern	0.613 (9)	1.86 (4)	74.44 (1)	32.71 (5)	9.21 (5)
4th	South London	0.553 (4)	2.14 (10)	72.20 (3)	26.52 (3)	11.87 (9)
5th	Central	0.612 (8)	2.08 (8)	63.23 (12)	30.29 (4)	9.12 (4)
6th	South West	0.599 (7)	1.62 (3)	54.97 (16)	34.61 (9)	6.86 (2)
7th	North West (Cheshire & Merseyside)	0.624 (10)	1.36 (2)	72.15 (4)	53.25 (13)	11.79 (8)
8th	North West London	0.558 (6)	2.00 (6)	68.05 (8)	34.48 (8)	14.41 (11)
9th	South East Coast	0.548 (3)	2.08 (9)	65.69 (11)	45.86 (12)	12.55 (10)
10th	East of England	0.557 (5)	3.49 (14)	60.47 (14)	33.65 (7)	10.20 (6)
11th	North West (Lancashire & South Cumbria)	0.638 (12)	2.52 (12)	70.10 (6)	32.89 (6)	15.27 (12)
12th	Yorkshire & Humber	0.671 (15)	2.04 (7)	66.80 (10)	45.39 (11)	11.39 (7)
13th	North West (Greater Manchester)	0.636 (11)	3.50 (15)	67.94 (9)	41.18 (10)	17.13 (13)
14th	Trent	0.654 (13)	2.27 (11)	69.00 (7)	58.51 (14)	23.01 (16)
15th	Southern West Midlands	0.671 (16)	3.64 (16)	73.52 (2)	88.31 (16)	21.26 (15)
16th	Staffordshire, Shropshire & Black Country	0.654 (14)	2.61 (13)	59.06 (15)	65.58 (15)	19.74 (14)

Analyses of Data by Key Indicators

The data is now examined more closely by looking at the key

indicators and presenting significant findings for each of them.

Admissions to Neonatal Care

Admission to neonatal care figures, demonstrates a general trend. This is, as the percentage of neonatal care admissions rises so too do multiple neonatal death figures. This is a logical assumption as it is likely many of those babies admitted are those seriously sick and/or small, with lower chances of survival. Conversely, regions with lower neonatal admissions may have a larger portion of healthier babies not requiring extra treatment and so less likely to result in neonatal death. In addition, it became apparent that Neonatal Admissions was also influenced by cohort size. The table below displays NN's ordered by cohort size, and comparable by Neonatal Admissions and Neonatal Deaths. In general, the smaller the multiple birth cohort, the greater the rate of neonatal admission.

From the data examined it is not possible to determine what part intrapartum or postnatal care play in the proportion of multiple birth babies admitted to a neonatal unit. Currently, there is no standard guideline on when and how to deliver multiples. Furthermore, the national examination of late term admissions to neonatal care note that multiples are proportionately more likely to be represented in this group but further analysis is required to understand the reasons for this.



TABLE 8

Neonatal Networks ordered by cohort size and compared by neonatal admissions and neonatal death rate

NEONATAL NETWORK	COHORT SIZE	NEONATAL ADMISSIONS %	MULTIPLE BIRTH NEONATAL DEATHS %
Southern West Midlands	522	88.31	2.49
North West (Lancashire & South Cumbria)	596	32.89	1.51
Staffordshire, Shropshire & Black Country	613	65.58	0.82
Trent	617	58.51	2.11
North West (Cheshire & Merseyside)	738	53.25	0.68
North West London	902	34.48	0.44
Northern	1,400	32.71	0.93
North West (Greater Manchester)	1,401	41.18	1.86
Central	1,492	30.29	1.01
South East Coast	1,729	45.86	1.27
South London	1,912	26.52	1.10
North Central & East London	1,918	26.17	0.57
Yorkshire & Humber	2,159	45.39	1.20
South West	2,713	34.61	0.59
Thames Valley & Wessex	2,975	24.57	1.11
East of England	3,667	33.65	1.64
AVERAGE	1,585	36.67	1.15

RED: More than 10% above average

GREEN: more than 10% below average

A photograph of two newborn twins lying in a hospital bed. They are wearing white headbands and have nasal cannulas inserted into their nostrils. The image is overlaid with a semi-transparent blue filter. In the background, a medical chart is visible with some handwritten notes.

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