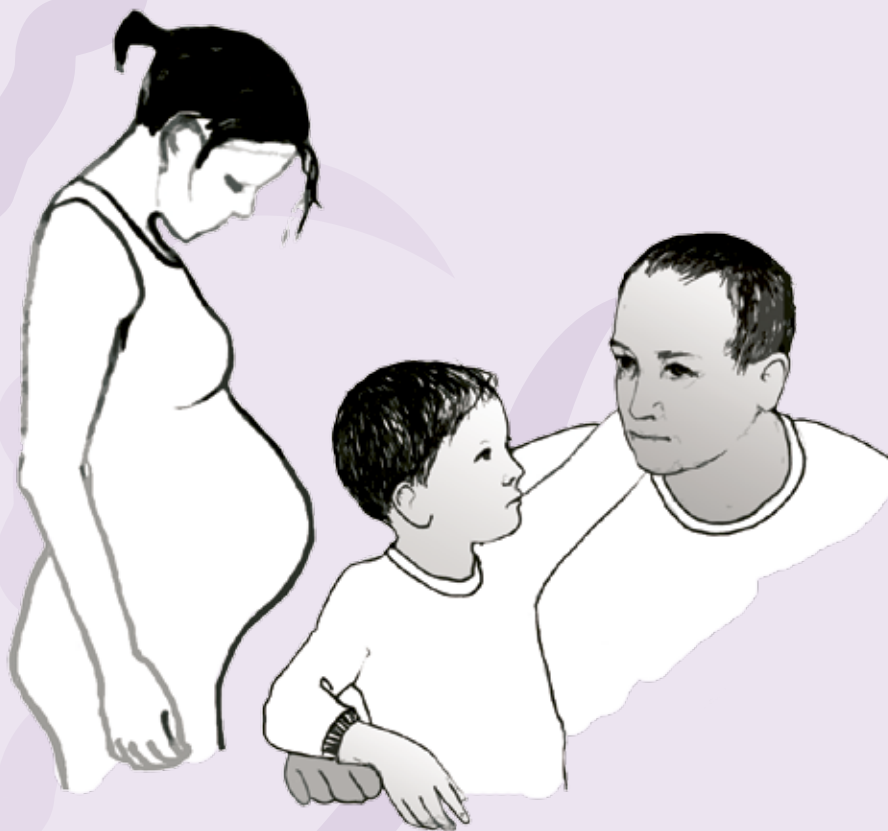


**Maternal, Newborn and
Infant Clinical Outcome
Review Programme**



MBRRACE-UK Perinatal Mortality Surveillance Report

**UK Perinatal Deaths for Births from
January to December 2014**



May 2016



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January to December 2014**

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on behalf of the MBRRACE-UK collaboration

May 2016

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Foreword

I very much welcome the publication of this, the second MBRRACE-UK national perinatal mortality surveillance report. The report comes at a time when attention is focused both in the UK and globally on reducing perinatal deaths. The MBRRACE-UK annual report is central to monitoring the effects of national and local initiatives to reduce our rates of stillbirth and neonatal death with the ambition to achieve rates similar to those experienced by our Scandinavian neighbours, some of whom have the lowest perinatal mortality rates in the world. It is pleasing therefore to see such a high level of professional engagement with this important national data collection system.


The findings are generally positive with an overall reduction in stillbirth and neonatal death rates continuing the trend from 2003. Nevertheless, if we are to achieve the ambitions set by the different UK countries - in the case of England a halving of the rates by 2030 and a 20% reduction by 2020 - then we are going to have to ensure that the rate of reduction gathers pace over time. I appreciate that this is going to be a challenge: the year on year trend for mothers to have their children at an older age is continuing, together with an increasing proportion having other risk factors, such as obesity, which increases the chances of complications in pregnancy, of stillbirth and of neonatal death.

An important addition to this report is the series of tables of the stabilised & adjusted rates for individual Trusts and Health Boards, and the comparison of those rates by level of service provision across five comparator groups. This simultaneously allows fairer comparisons between similar services in terms of the risk profile of the women they care for, whilst at the same time highlighting significant variations in rates between apparently similar services. Shining the spotlight on such variation allows us to ask the all-important questions of why such differences exist and what can we do to reduce this variation. It is only by Trusts and Health Boards asking such questions of their own services and critically examining the care given to each woman and her baby where a death has occurred, that we shall be able to identify the improvements needed to avoid such deaths in the future. The MBRRACE-UK team have highlighted in red and amber those Trusts and Health Boards which clearly need to review their care provision with some urgency. I would also urge all the remaining Trusts and Health Boards to undertake the same critical process if we are to achieve our ambition of reducing our national perinatal mortality rate to mirror those in northern Europe.

The Healthcare Quality Improvement Partnership is commissioning a standardised perinatal mortality review tool designed to support units in England, Scotland and Wales in undertaking high quality case reviews. The tool originates from a collaboration between the Department of Health, the stillbirth and neonatal death charity Sands and experts in the field. Use of the tool, alongside the Royal College of Obstetricians and Gynaecologists' Each Baby Counts initiative, will lead the way in enabling units to review their care provision. The UK has a longstanding tradition of self-critical audit and leads the world with the global gold standard Confidential Enquiry into Maternal Deaths where the care of each woman who dies is critically evaluated. It is now time for us to lead the world with a similar level of scrutiny of the care of each baby who dies during pregnancy or in the early newborn period. We owe this to the families in the UK who have to face such a tragedy.

For this reason I commend this report which should be read by every professional involved in providing, commissioning and evaluating maternity and neonatal care across the UK.

I want to pay tribute to the remarkable academic achievement that is MBRRACE-UK and underline the influence it is now having on the formulation of policy and impact on services. By providing a consistent and robust evidence base on which to take decisions, MBRRACE-UK is already saving lives.

A handwritten signature in black ink, appearing to read 'Ben Gummer', with a horizontal line underneath.

Ben Gummer, MP

Parliamentary Under-Secretary of State for Care Quality

Definitions used in this report

Late fetal loss	A baby delivered between 22 ⁺⁰ and 23 ⁺⁶ weeks gestational age showing no signs of life, irrespective of when the death occurred.
Stillbirth	A baby delivered at or after 24 ⁺⁰ weeks gestational age showing no signs of life, irrespective of when the death occurred.
<i>Antepartum stillbirth</i>	<i>A baby delivered at or after 24⁺⁰ weeks gestational age showing no signs of life and known to have died before the onset of care in labour.</i>
<i>Intrapartum stillbirth</i>	<i>A baby delivered at or after 24⁺⁰ weeks gestational age showing no signs of life and known to be alive at the onset of care in labour.</i>
Neonatal death	A liveborn baby (born at 20 ⁺⁰ weeks gestational age or later, or with a birthweight of 400g or more where an accurate estimate of gestation is not available) who died before 28 completed days after birth.
<i>Early neonatal death</i>	<i>A liveborn baby (born at 20⁺⁰ weeks gestational age or later, or with a birthweight of 400g or more where an accurate estimate of gestation is not available) who died before 7 completed days after birth.</i>
<i>Late neonatal death</i>	<i>A liveborn baby (born at 20⁺⁰ weeks gestational age or later, or with a birthweight of 400g or more where an accurate estimate of gestation is not available) who died after 7 completed days but before 28 completed days after birth.</i>
Perinatal death	A stillbirth or early neonatal death.
Extended perinatal death	A stillbirth or neonatal death.
Termination of pregnancy	The deliberate ending of a pregnancy, normally carried out before the embryo or fetus is capable of independent life.

Key Findings

1. In 2014 the number of births to mothers resident in the UK and Crown Dependencies at 24⁺⁰ weeks gestational age or later (excluding terminations of pregnancy) showed little change from 2013: 782,311 births compared with 781,932. There was a small decrease in the number of stillbirths (3,252 compared with 3,286) and neonatal deaths (1,381 compared with 1,436). The crude extended perinatal mortality rate was 5.92 per 1,000 total births, comprising 4.16 stillbirths per 1,000 total births and 1.77 neonatal deaths per 1,000 live births. These mortality rates are still higher than those reported by the best performing countries in Europe.
2. Significant variation in the rates of extended perinatal mortality across the UK persist, even after taking into account the effects of chance variation relating to small numbers of births in some organisations and adjusting for the case-mix differences. Amongst organisations responsible for commissioning care, stabilised & adjusted rates varied from 4.9 to 7.1 deaths per 1,000 total births.
3. Extended perinatal mortality rates have been calculated for Trusts and Health Boards using five comparator groups based on the number of births and the on-site availability of high level neonatal care in order to account for differences in the risk profile of women giving birth at these organisations. The average extended perinatal mortality rate for organisations delivering less than 2,000 births per annum was 4.2 deaths per 1,000 total births and 7.3 deaths per 1,000 total births in organisations with neonatal surgical provision and a Level 3 Neonatal Intensive Care Unit.
4. Stabilised & adjusted extended perinatal mortality rates varied within each comparator group of Trusts and Health Boards. This was particularly evident for organisations with neonatal surgical provision and a Level 3 Neonatal Intensive Care Unit: 6.0 to 9.7 deaths per 1,000 total births.
5. The percentage of extended perinatal deaths with a congenital anomaly recorded as the primary cause of death ranged from 0% to 53% for Trusts and Health Boards based on place of birth.
6. Over 90% of families who experienced a stillbirth or neonatal death were offered a post-mortem examination. In 45% of Trusts and Health Boards this offer was made for all stillbirths and neonatal deaths within their organisation, whereas 22% of organisations offered a post-mortem for less than 90% of deaths.
7. Overall, parental consent for a post-mortem was received for approximately 40% of all stillbirths and neonatal deaths.
8. The analysis of the mortality associated with the 2014 birth cohort has again identified particular areas in the UK where mortality rates are greater than 10% higher than average.
9. Pregnancies to women living in areas with the highest levels of social deprivation in the UK are over 50% more likely to end in stillbirth or neonatal death compared to births from the least deprived areas of the UK. Babies of Black or Black British and Asian or Asian British ethnicity had the highest risk of extended perinatal mortality with rates of 9.9 and 8.7 per 1,000 total births, respectively.
10. Overall, engagement of Trusts and Health Boards in the process of reporting stillbirths and neonatal deaths to MBRRACE-UK has improved. However, while some Trusts and Health Boards consistently report deaths to MBRRACE-UK in a timely fashion, for other, apparently similar, organisations the reporting of deaths appears less organised.

Recommendations

1. All organisations identified as having a stabilised & adjusted extended perinatal mortality rate that falls in the red or amber band should conduct a local review. This should include data checking for case validation and data quality followed by a full review of the care provision for all stillbirths and neonatal deaths in order to identify any local factors which might be responsible for their reported high stabilised & adjusted mortality rate. The review should also establish whether there are lessons to be learned to improve the quality of care provision within their organisation.
2. All organisations, irrespective of their extended perinatal mortality rate, should investigate individual stillbirths and neonatal deaths using a standardised process and independent, multidisciplinary peer review as recommended in the Report of the Morecambe Bay Investigation [1]. The information within the MBRRACE-UK Perinatal Surveillance Reports (including the reports for individual Trusts and Health Boards) and recommendations from MBRRACE-UK Confidential Enquiries can facilitate this process [2, 3].
3. NHS England, NHS Scotland, NHS Wales, Health and Social Care in Northern Ireland, in conjunction with professional bodies and national healthcare advisors responsible for clinical standards in the relevant specialties (where in existence), should establish targets that reflect each country's aspirations for rates of stillbirths, neonatal deaths, and extended perinatal deaths against which services can be assessed in future.
4. All organisations responsible for maternity services should have systematic processes in place in order to ensure that all babies born between 22⁺⁰ and 23⁺⁶ weeks gestational age who are not alive at delivery or who do not survive the neonatal period are reported to MBRRACE-UK. This will ensure international consistency of extended perinatal mortality rates which are not possible from current routine registration sources.
5. It is essential that all Trusts and Health Boards provide data which is complete, accurate and reported in a timely manner in order that the most accurate comparative mortality estimates can be calculated and used for quality assurance. In particular, this should be achieved by:
 - a. improving the provision of maternal data for both stillbirths and neonatal deaths;
 - b. ensuring that all relevant deaths are reported to MBRRACE-UK, including those where the baby was discharged home or to a hospice for palliative care;
 - c. ensuring complete and accurate notification of statutory data required for all births under their care to routine sources, including all home births.
6. All Trusts and Health Boards should work closely with MBRRACE-UK to improve their coding of the cause of death, based on the Cause Of Death & Associated Conditions (CODAC) classification system, in order to facilitate the appropriate targeting of interventions to reduce specific types of death.
7. A post-mortem examination should be offered in all cases of stillbirth and neonatal death in order to identify the cause of death where possible, to exclude potential contributory factors, and to improve the future pregnancy counselling of parents. For stillbirths, regardless of whether consent is provided for post-mortem examination, the placenta should always be submitted for histological examination, preferably by a specialist pathologist.

References

1. Kirkup B. *The Report of the Morecambe Bay Investigation: An independent investigation into the management, delivery and outcomes of care provided by the maternity and neonatal services at the University Hospitals of Morecambe Bay NHS Foundation Trust from January 2004 to June 2013* available online at: <https://www.gov.uk/government/publications>, 2015.
2. Draper ES, Kurinczuk JJ, Kenyon S, on behalf of MBRRACE-UK. *MBRRACE-UK 2015 Perinatal Confidential Enquiry: Term, singleton, normally-formed, antepartum stillbirth*. The Infant Mortality and Morbidity Studies, Department of Health Sciences, University of Leicester: Leicester, 2015.
3. Field DJ, Hyman-Taylor P, Bacon C, Draper ES, on behalf of MBRRACE-UK. *Perinatal confidential Enquiry - Congenital Diaphragmatic Hernia*. The Infant Mortality and Morbidity Studies Department of Health Sciences University of Leicester: Leicester, 2014.

Executive Summary

Background

This is the second UK perinatal surveillance report produced under the auspices of the Maternal, Newborn and Infant Clinical Outcome Review Programme (MNI-CORP). The programme is commissioned by the Healthcare Quality Improvement Partnership (HQIP) on behalf of NHS England, NHS Wales, the Scottish Government Health and Social Care Directorate, the Northern Ireland Department of Health, Social Services and Public Safety (DHSSPS), the States of Guernsey, the States of Jersey, and the Isle of Man Government. The report has been produced by MBRRACE-UK, a collaboration led from the National Perinatal Epidemiology Unit at the University of Oxford with members from the University of Leicester, who lead the perinatal aspects of the work, University of Liverpool, University of Birmingham, University College London, Bradford Teaching Hospitals NHS Foundation Trust, a general practitioner from Oxford, and Sands, the stillbirth and neonatal death charity.

The scope of the MNI-CORP programme has four main elements. This report focuses on:

Surveillance of all late fetal losses (22⁺⁰ to 23⁺⁶ weeks gestational age), stillbirths, and neonatal deaths.

Methods

Deaths to be reported to MBRRACE-UK since 1 January 2013 through the secure online reporting system are:

- late fetal losses: a baby delivered between 22⁺⁰ and 23⁺⁶ weeks gestational age showing no signs of life, irrespective of when the death occurred;
- stillbirths: a baby delivered at or after 24⁺⁰ weeks gestational age showing no signs of life, irrespective of when the death occurred;
- neonatal deaths: a liveborn baby (born at 20⁺⁰ weeks gestational age or later, or with a birthweight of 400g or more where an accurate estimate of gestation is not available) who died before 28 completed days after birth.

Individual level information on all births in the UK is obtained in order to generate mortality rates adjusted for maternal, baby, and socio-demographic risk factors. Information for England, Wales, and the Isle of Man (NHS Numbers for Babies (NN4B) and Office for National Statistics (ONS) birth registration data), Scotland (National Records Scotland (NRS) and Information Services Division (ISD)), Northern Ireland (Northern Ireland Maternity System (NIMATS)), Bailiwick of Guernsey (Health and Social Services Department), and the Bailiwick of Jersey (Health Intelligence Unit) are combined to give a single dataset of births for the whole of the UK and the Crown Dependencies. This data is then combined with the information on the deaths to obtain the final data for analysis.

Analysis

The main findings of the report are represented in a combination of maps and tables showing both the crude and the stabilised & adjusted mortality rates for stillbirths, neonatal deaths, and extended perinatal deaths (stillbirth and neonatal deaths combined). In order to ensure comparability of mortality rates between organisations, births less than 24⁺⁰ weeks gestational age and terminations of pregnancy have been excluded from the reported mortality rates. This avoids the influence of the wide disparity in the classification of babies born before 24⁺⁰ weeks gestational age as a neonatal death or a fetal loss and the known variation in the rate of termination of pregnancy for congenital anomaly across the UK.

Rates of stillbirth, neonatal death, and extended perinatal death are reported for four groups of clinical and administrative organisations:

- organisations responsible for population based care commissioning based on postcode of mother's residence at time of delivery;
- service delivery organisations based on place of birth;
- Neonatal Networks based on place of birth;
- Local Government areas based on postcode of mother's residence at time of delivery.

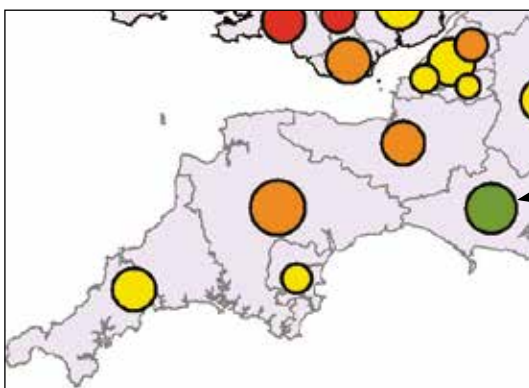
The interpretation of any mortality rate is affected by the extent to which there is variation in the disease severity of the cases for any particular organisation or geographical area when compared to elsewhere. In order to provide a more reliable comparison, the data produced in this report is shown both as 'crude' mortality rates and as 'stabilised & adjusted' mortality rates. This method of adjustment takes into account the effects of chance variation and also allows for key factors which are known to increase the risk of perinatal mortality in order to identify those organisations which, statistically, have mortality rates above or below a particular benchmark. In this report, data is presented compared to either the UK average or, for Trusts and Health Boards of birth, the average mortality in similar organisations.

Reported mortality rates

The data in the main report is shown for the relevant commissioning and service delivery organisations, with the mortality analysis based on the mother's address at the time the birth occurred and the place of birth, respectively. There are separate maps for stillbirths, neonatal deaths, and extended perinatal deaths. For each type of mortality a pair of maps is presented: one showing the crude rate and the other showing the stabilised & adjusted rate. The size of each circle on the map broadly represents the number of births in 2014 for the particular organisation and the colour represents their rates of mortality in comparison to the appropriate average rate. Aspirational rates have also been included based on estimated equivalent rates in the Nordic countries (Norway, Sweden, Denmark, Finland, and Iceland): 3.0 stillbirths per 1,000 births; 1.3 neonatal deaths per 1,000 live births; 4.3 extended perinatal deaths per 1,000 births:

- dark green: lower than the 'aspirational' target;
- light green: more than 10% lower than average;
- yellow: up to 10% lower than average;
- amber: up to 10% higher than average;
- red: more than 10% higher than average.

Within the tables particular emphasis has been given to the extended perinatal death rate which has been colour coded, again based on comparison to the relevant average following the same principle as described for the maps. An example of the how the tables and maps appear is shown below:



Stabilised & adjusted extended perinatal mortality rate more than 10% lower than the UK average.

Organisation	Total births [§]	Rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [‡]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Dorset	7,377	2.58	3.61 (2.87 to 4.80)	0.95	1.50 (1.09 to 2.20)	3.52	5.09 (4.06 to 6.39)	●
Northern, Eastern and West Devon	9,067	4.52	4.57 (3.71 to 5.96)	1.55	1.71 (1.23 to 2.50)	6.07	6.29 (5.30 to 7.69)	●
South Devon and Torbay	2,721	*	4.09 (3.10 to 5.51)	*	1.57 (1.07 to 2.47)	4.41	5.63 (4.47 to 7.31)	●

All organisations identified as having a stabilised & adjusted stillbirth, neonatal, or extended perinatal mortality rate that falls in the red band should conduct a local review. This should include data checking for case validation and data quality, followed by a full review of the care provision for all stillbirths and neonatal deaths, to identify any local factors which might be responsible for their reported high stabilised & adjusted mortality rate and establish whether there are potentially avoidable factors that could be managed differently.

While the UK average mortality rate, or that of similar service delivery organisations, has been used again in this MBRRACE-UK report, MBRRACE-UK will be working closely with all UK NHS and relevant professional organisations to set benchmarks for stillbirths and neonatal mortality that properly reflect national aspirations.

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Abbreviations

BMI	Body Mass Index
CCG	Clinical Commissioning Group
CHI	Community Health Index (Scotland)
CI	Confidence interval
CMACE	Centre for Maternal and Child Enquiries
CODAC	Cause Of Death & Associated Conditions
DHSSPS	Department of Health, Social Services and Public Safety (Northern Ireland)
EDD	Estimated Date of Delivery
EUROSTAT	Statistical Office of the European Union
FAQ	Frequently Asked Question
GSS	Government Statistical Service
HQIP	Healthcare Quality Improvement Partnership
HSCIC	Health and Social Care Information Centre
ICD-10	International Statistical Classification of Diseases and Related Health Problems, 10th Revision
ISD	Information Services Division
IVF	In Vitro Fertilisation
LCG	Local Commissioning Group (Northern Ireland)
MBRRACE-UK	Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK
MNI-CORP	Maternal, Newborn and Infant Clinical Outcome Review Programme
NICU	Neonatal Intensive Care Unit
NIMACH	Northern Ireland Maternal and Child Health
NIMATS	Northern Ireland Maternity System
NIMI	Northern Ireland Maternal and Infant Loss
NISRA	Northern Ireland Statistics and Research Agency
NN4B	NHS Numbers for Babies
NRS	National Records of Scotland
ODN	Operational Delivery Network
ONS	Office for National Statistics
PDS	Personal Demographics Service
RCOG	Royal College of Obstetricians and Gynaecologists
SMR	Standardised Mortality Ratio
SMR02	Maternity Inpatient and Day Case Dataset (Scotland)
WHO	World Health Organization

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1. Introduction

This is the second MBRRACE-UK Perinatal Mortality Surveillance Report and includes information on deaths in the UK and Crown Dependencies arising from births during 2014.

MBRRACE-UK are commissioned by the Healthcare Quality Improvement Partnership (HQIP) to undertake the Maternal, Newborn and Infant Clinical Outcome Review Programme (MNI-CORP). The aims of MNI-CORP are to collect, analyse and report national surveillance data and conduct national confidential enquiries in order to stimulate and evaluate improvements in health care for mothers and babies (Box 1). This report focuses on the **surveillance of all late fetal losses (22⁺⁰ to 23⁺⁶ weeks gestational age), stillbirths, and neonatal deaths**.

Perinatal mortality surveillance involves the identification and notification of all eligible deaths and the collection of a limited and tightly defined demographic and clinical dataset. The goal is to receive notification of every death and to collect high-quality data about each one. This information allows the calculation of national, regional and local mortality rates and, with appropriate denominator data, the calculation of appropriately 'stabilised & adjusted' mortality rates which take into account the effects of chance variation and also allow for key factors known to increase the risk of perinatal mortality (see Chapter 2 for further explanation). This information is presented in order to assist clinicians, commissioners, managers, parents, and the public in raising standards of obstetric and neonatal care in order to reduce perinatal mortality across the UK.

Box 1: Scope of the Maternal, Newborn and Infant Clinical Outcome Review Programme

1. Surveillance and confidential enquiries of all maternal deaths – that is deaths of women who are pregnant or who die up to 1 year after their pregnancy ends.
2. Confidential enquiries of an annual rolling programme of topic-specific serious maternal morbidity.
3. **Surveillance of all late fetal losses (22⁺⁰ to 23⁺⁶ weeks gestational age), stillbirths, and neonatal deaths.**
4. A biennial programme of topic-specific confidential enquiries into aspects of stillbirth and neonatal death or serious neonatal morbidity.

1.1 Perinatal mortality in the UK

Rates of stillbirth and neonatal death obtained from statutory birth and death registrations continued to fall in 2014 (see Figure 1) but still appear higher than the rates seen in many other high income countries [1-6]. In order to reduce, perhaps even eliminate, these differences there are currently a number of initiatives aimed at reducing stillbirth and neonatal death across the UK.

In November 2015 the Secretary of State for Health announced the Government's ambition to halve the rate of stillbirths and neonatal deaths in England by 2030, with a 20% reduction by 2020. The recent National Maternity Review reported that rates of maternal and perinatal mortality are reducing over time but highlighted the variation in the quality of care provided across England [7] and identified key priorities to drive improvement and ensure women and babies receive excellent care wherever they live. In

response, NHS England have launched Spotlight on Maternity [8] which calls for all NHS organisations to develop bespoke maternity Safety Improvement Plans identifying the actions that they are going to put in place to start to work towards this target. One area of development is the Saving Babies' Lives Care Bundle, launched in March 2016, which aims to reduce stillbirth and early neonatal morbidity.

In Scotland Workstream 1 of the Early Years Collaborative [9] includes the aim of reducing stillbirths and neonatal deaths. The Scottish Government funded Maternity and Children's Quality Improvement Collaborative (MCQIC) launched in March 2013, as part of the Scottish Patient Safety Programme, which aims to reduce avoidable harm across maternity, neonatal, and paediatric care by supporting frontline staff working in maternity, neonatal, and paediatric services to deliver person centred, safe, and effective services for all mothers and babies.

The national improvement service for NHS Wales, 1000 Lives Improvement, includes reducing preventable stillbirth in Wales as one of its programme areas [10], while in Northern Ireland, the Northern Ireland Maternal and Infant Loss (NIMI) steering group has been established in order to support the reduction in the number of stillbirths and neonatal deaths.

Each Baby Counts [11] is a UK-wide initiative, led by the Royal College of Obstetricians & Gynaecologists (RCOG), which was established in 2015 with the aim of reducing the number of babies who die or are left severely disabled as a result of incidents occurring during term labour by 50% by 2020.

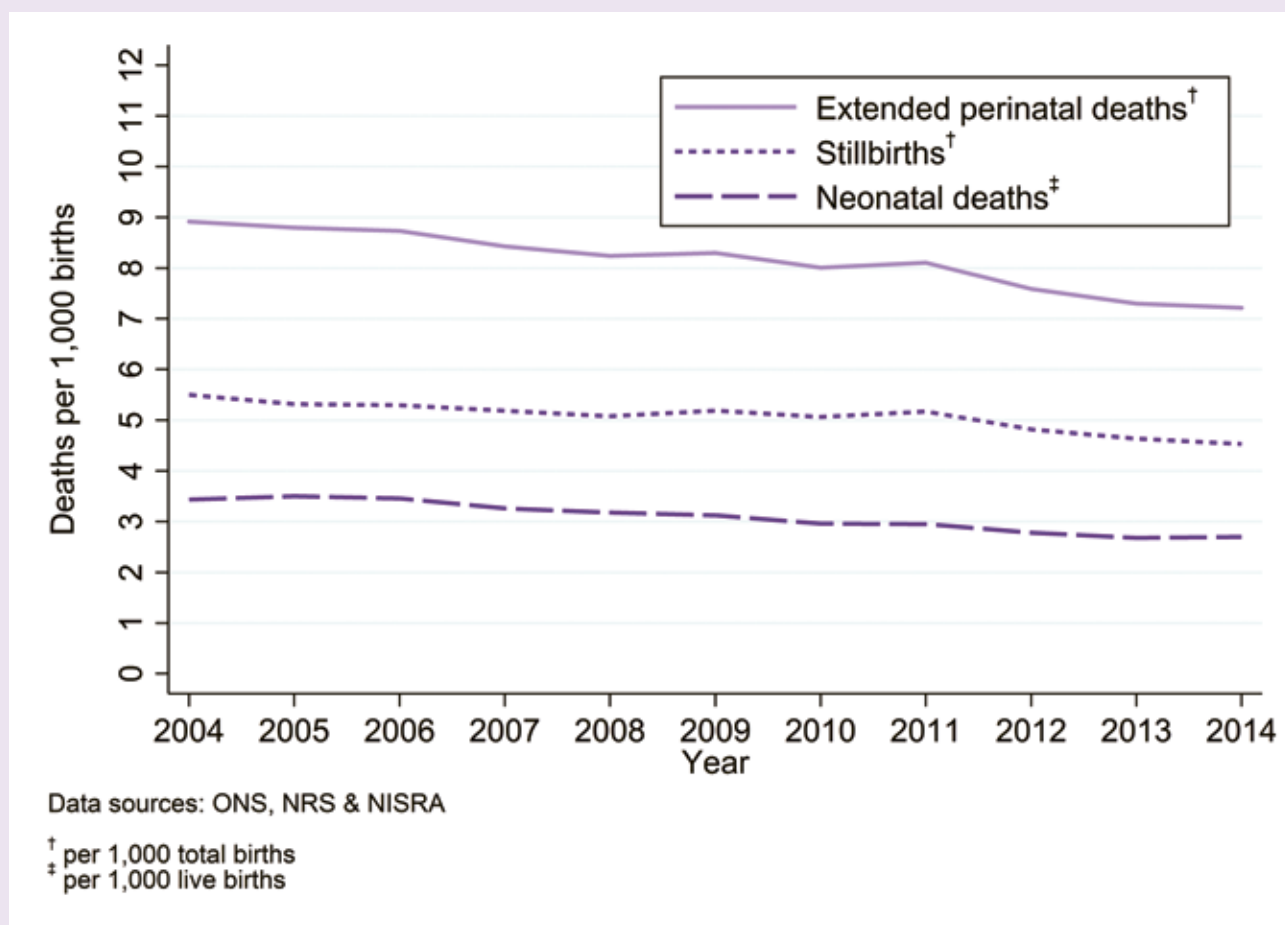
MBRRACE-UK will be working closely with all UK NHS and relevant professional organisations to set aspirational targets for stillbirths and neonatal mortality, detailing the year on year improvement required to achieve the national targets and bring the UK closer to the lower mortality rates reported by many of our European neighbours.

1.2 Perinatal mortality data in the UK available from routine sources

MBRRACE-UK have established a robust method of presenting extended perinatal mortality data for the UK. As this is only the second year of reporting using this new methodology we are currently unable to produce data on mortality trends over time. Therefore to provide a context for the findings of this report, in Figure 1 the trends are shown for stillbirth, neonatal, and extended perinatal mortality rates in the UK for the years 2004 to 2014 from routine sources.

Rates of stillbirth in the UK are known to have been declining since the statutory registration of stillbirths started in 1927 in England and Wales (1938 in Scotland) and this improvement continued in 2014 [12]. Based on routinely published data from the Office for National Statistics (ONS) for England and Wales, the Information Services Division (ISD) and National Records of Scotland (NRS) for Scotland, and the Northern Ireland Statistics and Research Agency (NISRA) for Northern Ireland [12-21], in 2014 across the UK there were 779,692 total registered births with 3,533 stillbirths and 2,093 neonatal deaths. This compares with 719,958 total births, 3,962 stillbirths and 2,458 neonatal deaths in 2004. Therefore, although the total number of births in the UK increased by 59,734 between 2004 and 2014, there were 429 fewer stillbirths in 2014 compared to 2004 and 365 fewer neonatal deaths.

Figure 1: Total stillbirth, neonatal, and extended perinatal mortality rates from statutory registrations: United Kingdom, 2004 to 2014



The figures used to produce Figure 1 are presented in Table 26 (Appendix A1), together with the published mortality rates from routine birth and death registrations for each country of the UK. Differences in the law in Northern Ireland relating to the termination of pregnancy means that a greater proportion of babies with severe congenital anomalies are carried to term but then die after birth. This is reflected in the relatively high rate of neonatal death for Northern Ireland.

1.3 Overview of this report

This report provides information on extended perinatal mortality for births in the UK during 2014. In Chapter 2, the MBRRACE-UK data collection process is described together with the methods used for reporting mortality. Crude and stabilised & adjusted stillbirth, neonatal mortality, and extended perinatal mortality rates are presented in Chapter 3 for babies born at 24⁺⁰ weeks gestational age or later (excluding terminations of pregnancy) by organisation responsible for population based care commissioning (based on mother's postcode at time of delivery) and by service delivery organisation (Trust or Health Board) based on place of birth. Equivalent mortality rates are presented later in the report by Neonatal Network (Appendix 3.1) and local authority of residence (Appendix 3.2). In Chapter 4, more detailed information is given regarding babies born at 22⁺⁰ to 23⁺⁶ weeks gestational age and for those babies with a congenital anomaly recorded as the cause of death. All categories of reported causes of death are described in Chapter 5, together with information on post-mortems. Finally, factors which influence rates of perinatal death are discussed in Chapter 6. In addition, individual Trust and Health

Board reports are also available to local MBRRACE-UK registered reporters regarding mortality rates within their organisation, via the online reporting system. These reports provide detailed information to local clinical teams relating to the influence of factors such as ethnicity, socio-economic deprivation level and gestational age of babies or their local case mix.

1.4 Changes from the previous report

In the previous MBRRACE-UK perinatal surveillance report for births in 2013, information based on the place of birth was presented by Operational Delivery Network (ODN) for births in England together with Health Boards in Scotland and Wales, and Health and Social Care Trusts in Northern Ireland. Information for individual Trusts in England was published in a supplementary report on 16 December 2015 [22]. For births in 2014, it has been possible to include in this report the mortality rates for individual NHS Trusts in England (together with Health Boards in Scotland and Wales, Health and Social Care Trusts in Northern Ireland, and the Crown Dependencies) based on place of birth. This change has meant that mortality rates are not reported for ODNs in England but mortality rates are included for Neonatal Networks across the UK, which in England are generally co-terminus with ODNs.

References

1. EURO-Peristat Project in collaboration with SCPE EUROCAT & EURONEOSTAT. European Perinatal Health Report, Health and Care of Pregnant Women and Babies in Europe in 2010. Available online at: <http://www.euoperistat.com/reports/european-perinatal-health-report-2010.html>. Euro-Peristat: 2012.
2. Lawn JE, Blencowe H, Waiswa P, Amouzou A, Mathers C, Hogan D, Flenady V, Froen JF, Qureshi ZU, Calderwood C, Shiekh S, Jassir FB, You D, McClure EM, Mathai M, Cousens S. Stillbirths: rates, risk factors, and acceleration towards 2030. *The Lancet* 2016; 387: 587-603.
3. Horton R, Samarasekera U. Stillbirths: ending an epidemic of grief. *The Lancet* 2016; 387: 515-516 e514 and e516.
4. Heazell AE, Siassakos D, Blencowe H, Burden C, Bhutta ZA, Cacciatore J, Dang N, Das J, Flenady V, Gold KJ, Mensah OK, Millum J, Nuzum D, O'Donoghue K, Redshaw M, Rizvi A, Roberts T, Toyin Saraki HE, Storey C, Wojcieszek AM, Downe S. Stillbirths: economic and psychosocial consequences. *The Lancet* 2016; 387: 604-616.
5. Froen JF, Friberg IK, Lawn JE, Bhutta ZA, Pattinson RC, Allanson ER, Flenady V, McClure EM, Franco L, Goldenberg RL, Kinney MV, Leisher SH, Pitt C, Islam M, Khera A, Dhaliwal L, Aggarwal N, Raina N, Temmerman M. Stillbirths: progress and unfinished business. *The Lancet* 2016; 387: 574-586.
6. Flenady V, Wojcieszek AM, Middleton P, Ellwood D, Erwich JJ, Coory M, Khong TY, Silver RM, Smith GCS, Boyle FM, Lawn JE, Blencowe H, Leisher SH, Gross MM, Horey D, Farrales L, Bloomfield F, McCowan L, Brown SJ, Joseph KS, Zeitlin J, Reinebrant HE, Ravaldi C, Vannacci A, Cassidy J, Cassidy P, Farquhar C, Wallace E, Siassakos D, Heazell AEP, Storey C, Sadler L, Petersen S, Frøen JF, Goldenberg RL. Stillbirths: recall to action in high-income countries. *The Lancet* 2016; 387: 691-702.
7. NHS England. National Maternity Review. Available online at: <https://www.england.nhs.uk/tag/maternity-review/>. NHS England: 2016.
8. NHS England. Spotlight on Maternity. Available online at: <https://www.england.nhs.uk/signup-tosafety/wp-content/uploads/sites/16/2015/11/spotlight-on-maternity-guide.pdf>. NHS England: 2016.

9. The Scottish Government. Early Years Collaborative, Workstreams. Available online at: <http://www.gov.scot/Topics/People/Young-People/early-years/early-years-collaborative/workstreams/workstream-one> The Scottish Government: 2016.
10. Public Health Wales. 1000 lives. Available online at: <http://www.1000livesplus.wales.nhs.uk/home>. NHS Wales: 2016.
11. Royal College of Obstetricians & Gynaecologists. Each Baby Counts national quality improvement programme. <https://www.rcog.org.uk/eachbabycounts>. RCOG: 2016.
12. Office for National Statistics. 2014 Birth Summary Tables, England and Wales. Available online at: <http://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/datasets/birthsummarytables>. ONS: 2015.
13. National Records of Scotland. 2013 Births, Deaths and Other Vital Events - Preliminary Annual Figures. Available online at: <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/vital-events/general-publications/births-deaths-and-other-vital-events-preliminary-annual-figures/2013>. NRS: 2014.
14. National Records of Scotland. 2014 Births, Deaths and Other Vital Events, Preliminary Annual Figures. Available online at: <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/vital-events/general-publications/births-deaths-and-other-vital-events-preliminary-annual-figures/2014>. NRS: 2015.
15. Northern Ireland Statistics and Research Agency. Statistical Bulletin: Deaths in Northern Ireland 2013. Available online at: http://www.nisra.gov.uk/archive/demography/publications/births_deaths/deaths_2013.pdf. NISRA: 2014.
16. Northern Ireland Statistics and Research Agency. Registrar General Annual Report 2014, Stillbirths and Infant Deaths. Available online at: <http://www.nisra.gov.uk/demography/default.asp99.htm>. NISRA: 2015.
17. Northern Ireland Statistics and Research Agency. Registrar General Annual Report 2014, Births. Available online at: <http://www.nisra.gov.uk/demography/default.asp98.htm>. NISRA: 2015.
18. Office for National Statistics. 2013 Death Registrations Summary Tables, England and Wales. Available online at: <http://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datasets/deathregistrationssummarytablesenglandandwalesreferencetables>. ONS: 2014.
19. Office for National Statistics. 2013 Birth Summary Tables, England and Wales. Available online at: <http://www.ons.gov.uk/ons/rel/vsob1/birth-summary-tables--england-and-wales/2013/index.html>. ONS: 2014.
20. Office for National Statistics. 2014 Death Registrations Summary Tables, England and Wales. Available online at: <http://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/bulletins/deathsregistrationssummarytables/2015-07-15>. ONS: 2015.
21. Office for National Statistics. 2013 Childhood, Infant and Perinatal Mortality in England and Wales. Available online at: <http://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datasets/childmortalitystatisticschildhoodinfantandperinatalchildhoodinfantandperinatalmortalityinenglandandwales>. ONS: 2015.
22. Manktelow BN, Smith LK, Evans TA, Hyman-Taylor P, Kurinczuk JJ, Field DJ, Smith PW, Mielewicz F, Draper ES, on behalf of the MBRRACE-UK Collaboration. MBRRACE-UK Perinatal Mortality Surveillance Report, UK Perinatal Deaths for Births from January to December 2013 - Supplementary Report: UK Trusts and Health Boards. The Infant Mortality and Morbidity Studies, Department of Health Sciences, University of Leicester: Leicester, 2015.



2. MBRRACE-UK Methods for Reporting Perinatal Mortality Rates

2.1 Deaths reported to MBRRACE-UK

Deaths to be reported to MBRRACE-UK since 1 January 2013 are:

- *late fetal losses*: a baby delivered between 22⁺⁰ and 23⁺⁶ weeks gestational age showing no signs of life, irrespective of when the death occurred;
- *stillbirths*: a baby delivered at or after 24⁺⁰ weeks gestational age showing no signs of life, irrespective of when the death occurred;
- *neonatal deaths*: a liveborn baby born at 20⁺⁰ weeks gestational age or later, or with a birthweight of 400g or more (where an accurate estimate of gestation is not available) who died before 28 completed days after birth.

These definitions also include any late fetal loss, stillbirth, or neonatal death resulting from a termination of pregnancy.

In an effort to ensure complete data collection and to facilitate international comparisons, the eligibility criteria for MBRRACE-UK are based on gestational age at delivery irrespective of when the death occurred. Therefore, all births delivered from 22⁺⁰ weeks gestational age showing no signs of life must be reported, irrespective of when the death occurred: the date of delivery and date of confirmation of death are both reported for these deaths.

MBRRACE-UK has established a secure online reporting system which can be accessed by all UK Trusts and Health Boards. Responsibility for reporting a death and for the completeness and the quality of the data reported to MBRRACE-UK lies with the Trust or Health Board where the death occurred. Each Trust and Health Board has identified a small number of MBRRACE-UK Lead Reporters who act as key points of contact between their organisation and MBRRACE-UK. A comprehensive network of more than 450 Lead Reporters has been established across all UK delivery sites (see Appendix A2.1). In order to check for relevant deaths that have not been reported to MBRRACE-UK, details of statutorily registered deaths are obtained from ONS (England and Wales), NRS (Scotland) and Northern Ireland Maternity Information System (NIMATS) and NISRA (Northern Ireland). More details of the MBRRACE-UK reporting system are given in Appendix A2.2 to A2.5).

2.2 Information collected by MBRRACE-UK

Comprehensive information on each death is requested by MBRRACE-UK in order to allow detailed examination of the risk factors for perinatal mortality in the UK. Data items are collected with the aims of: a) offering more appropriate adjustment of the crude mortality rates than had previously been possible; and b) providing a clearer insight into the health, social and lifestyle factors most commonly associated with stillbirth or neonatal death.

The data relating to each death consists of information about the following:

- mother's and baby's identifying information (to permit the cross-checking of each death against other national databases and to facilitate the identification of duplicate records);
- mother's health, lifestyle and previous pregnancy history;
- mother's antenatal care;
- labour and delivery;
- cause of death and post-mortem examination.

Details of the data requested for each late fetal loss, stillbirth and neonatal death can be found in Appendix A2.2. Approvals have been obtained from all of the relevant authorities in order for identifiable data to be collected without consent and to access statutory birth and death information (Appendix A2.3).

Details of the completeness of key variables reported by Trusts and Health Boards in relation to deaths of babies born in 2014 are given in Appendix A2.6. In order to help reporters, a 'traffic light' system has also been developed for the MBRRACE-UK reporting system to highlight the completeness of data collection in the various sections of the case record form.

2.3 The 2014 birth cohort

In this report, rates of stillbirth, neonatal death and extended perinatal death are presented for births from 1 January 2014 to 31 December 2014; thus, neonatal deaths of births in December 2014 which occurred in January 2015 are included. The reporting of mortality for a birth cohort is in contrast to statutory publications, and previous perinatal mortality reports published by the Centre for Maternal and Child Enquiries (CMACE), which were based on deaths in a calendar year. This method of reporting allows more accurate estimates of mortality rates to be produced as appropriate denominators are available.

Individual level information on all births in the UK and Crown Dependencies is obtained in order to generate mortality rates adjusted for maternal, baby, and socio-demographic risk factors. Information for England, Wales and the Isle of Man (NHS Numbers for Babies (NN4B) and ONS birth registration data), Scotland (NRS and ISD), Northern Ireland (NIMATS), Bailiwick of Guernsey (Health and Social Services Department) and the Bailiwick of Jersey (Health Intelligence Unit) were combined to give a single dataset of births for the whole UK and Crown Dependencies. This data was then combined with the information on the deaths to obtain the final data for analysis.

2.4 Births in Scotland in 2014

While all registered births in Scotland are reported to MBRRACE-UK by ISD, full individual information on the characteristics of the mother and baby was not available for about 11% of the births in Scotland during 2014. This was because the Maternity Inpatient and Day Case Dataset (SMR02) record had either not been submitted to ISD from the place of delivery or ISD had been unable to match the SMR02 record to the corresponding birth registration record. In this 2014 MBRRACE-UK report, information on all births in Scotland has been included wherever possible and, where possible, the missing information has been imputed as described in Appendix A2.8. However, it is not possible to report stabilised & adjusted mortality rates for the Lothian and Western Isles Health Boards, and Local Authorities covered by these providers, because of particularly high rates of missing data with specific groups of

babies disproportionately affected. It was, therefore, not possible to reliably estimate the stabilised & adjusted mortality rates for these organisations. MBRRACE-UK will continue to work with ISD to ensure that complete data is available in the future.

MBRRACE-UK Recommendation

It is essential that all Trusts and Health Boards provide data which is complete, accurate and reported in a timely manner in order that the most accurate comparative mortality estimates can be calculated and used for quality assurance. In particular, this should be achieved by:

- a. improving the provision of maternal data for both stillbirths and neonatal deaths.
- b. ensuring that all relevant deaths are reported to MBRRACE-UK, including those where the baby was discharged home or to a hospice for palliative care.
- c. ensuring complete and accurate notification of statutory data required for all births under their care to routine sources, including all home births.

2.5 Deaths included in reported mortality rates

In order to ensure comparability of mortality rates between organisations, **births less than 24⁺⁰ weeks gestational age and terminations of pregnancy have been excluded from the reported mortality rates**. This avoids the influence of the wide disparity in the classification of babies born before 24⁺⁰ weeks gestational age as a neonatal death or a fetal loss as well as the known variation in the rate of termination of pregnancy for congenital anomaly across the UK.

The intention for future MBRRACE-UK reports is to account for all deaths from 22⁺⁰ weeks gestational age and to measure and report the influence of deaths due to congenital anomalies. In order to achieve this it is essential that all Trusts and Health Boards provide data for all fetal losses between 22⁺⁰ and 23⁺⁶ weeks gestational age and work with MBRRACE-UK to improve the cause of death classification. These issues are discussed further in Chapter 4.

2.6 Organisations for which mortality rates are reported

Rates of stillbirth, neonatal death, and extended perinatal death are reported for four groups of clinical and administrative organisations:

1. **Organisations responsible for population based care commissioning based on postcode of mother's residence at time of delivery:**
 - England: Clinical Commissioning Groups (CCG);
 - Scotland: Health Boards;
 - Wales: Health Boards;

- Northern Ireland: Local Commissioning Groups (LCGs);
- Crown Dependencies: Isle of Man, Bailiwick of Guernsey, and Bailiwick of Jersey.

2. Service delivery organisations based on place of birth:

- England: NHS Trusts;
- Scotland: Health Boards;
- Wales: Health Boards;
- Northern Ireland: Health and Social Care Trusts;
- Crown Dependencies: Isle of Man, Bailiwick of Guernsey, and Bailiwick of Jersey.

3. Neonatal Networks based on place of birth: UK only (Appendix A3.1).

4. Local Government areas based on postcode of mother's residence at time of delivery (Appendix A3.2):

- England: Single tier authorities, upper tier authorities and London boroughs;
- Scotland: Unitary authorities;
- Wales: Local Authorities;
- Northern Ireland: Reported for the whole country;
- Crown Dependencies: Isle of Man, Bailiwick of Guernsey, and Bailiwick of Jersey.

2.7 Analysis of mortality rates

Three mortality outcomes are reported for each organisation: stillbirth, neonatal death, and extended perinatal death. These mortality rates are presented in two different ways: as a 'crude' mortality rate and as a 'stabilised & adjusted' mortality rate.

The **crude mortality rate** is the number of deaths divided by the number of total births (or live births in the case of neonatal mortality) for 2014 and provides an annual snapshot of the mortality in an organisation.

While the crude rate is informative, in that it describes exactly what happened for the organisation, it can be potentially misleading when trying to highlight organisations where the mortality rate is higher than expected due to variation in the quality of care. First, the number of perinatal deaths for many organisations is likely to be small, as these deaths are rare, and there will be more deaths in some years than in others just by chance. This can lead to large fluctuations in the crude mortality rate, especially for organisations that have a very small number of births. Second, some organisations have more women at high risk of experiencing a stillbirth or neonatal death; for example, due to areas of high socio-economic deprivation, and thus the case-mix of the population served can influence mortality rates even when high quality maternity and neonatal care is provided.

In order to be able to compare organisations more fairly, **stabilised & adjusted mortality rates** have been calculated and presented alongside the crude mortality rates. Where there is only a small number of births in an organisation it is difficult in any one year to be sure that any extreme value seen for the crude mortality rate is real and not just a chance finding. A stabilised rate allows for the effects of chance variation due to small numbers. For this reason, the stabilised & adjusted mortality rate will tend to be closer to the average mortality rate than will the crude mortality rate, especially for organisations with a small number of births.

The mortality rates are also adjusted to account for key factors which are known to increase the risk of perinatal mortality. The extent of the adjustment is limited to only those factors that are collected for all births across the whole of the UK: mother's age; socio-economic deprivation based on the mother's residence; baby's ethnicity; baby's sex; whether they are from a multiple birth; and gestational age at birth (neonatal deaths only). Therefore, some factors that might be associated with poor perinatal outcomes could not be taken into account in the adjustment because they are not universally collected; for example, maternal smoking and body mass index (BMI). (See Appendix A2.7 for more details.)

It is important to remember that the mortality rates reported are not definitive measures of the quality of care received by any individual or group. Rather, they are estimates of the rate of mortality under particular circumstances: i.e. if all of the data collection was complete and accurate and if all of the assumptions that have gone into the statistical modelling are also completely correct. While, in practice, this is never completely the case, the rates reported here are robust and make an important contribution to the identification of variations in the quality of perinatal and neonatal care in the UK.

2.8 Identifying potentially high and low rates of death

The crude and the stabilised & adjusted mortality rates are presented as both tables and maps. In the maps, each organisation has been colour coded based on the extent to which their particular mortality rate is above, or below, the 'average' mortality rate. For the organisations based on the postcodes of the mothers' residences at time of delivery, and for Neonatal Networks, this average is the overall observed mortality rate for the whole of the UK and the Crown Dependencies.

However, it is known that service delivery organisations based on the place of birth vary widely in the risk profile of pregnancies referred to their service and, therefore, it is reasonable to anticipate variation in their expected mortality rates. To help account for the variation due to the risk profile, all of the Trusts and Health Boards have been classified hierarchically into five mutually exclusive comparator groups based on their level of service provision and they are compared to the average mortality rate within their comparator group. The five comparator groups are:

1. Level 3 Neonatal Intensive Care Unit (NICU) and Neonatal Surgery.
2. Level 3 NICU.
3. 4,000 or more births per annum at 22 weeks or later.
4. 2,000-3,999 births per annum at 22 weeks or later.
5. Under 2,000 births per annum at 22 weeks or later.

'Aspirational' mortality rates have also been included based on estimated equivalent rates in the Nordic countries (Norway, Sweden, Denmark, Finland, and Iceland): 3.0 stillbirths per 1,000 total births; 1.3 neonatal deaths per 1,000 live births; 4.3 extended perinatal deaths per 1,000 total births. The colour coding used in the maps and tables is:

- dark green: lower than the 'aspirational' target (not applicable for service delivery organisations);
- light green: more than 10% lower than the average;
- yellow: up to 10% lower than the average;
- amber: up to 10% higher than the average;
- red: more than 10% higher than the average.

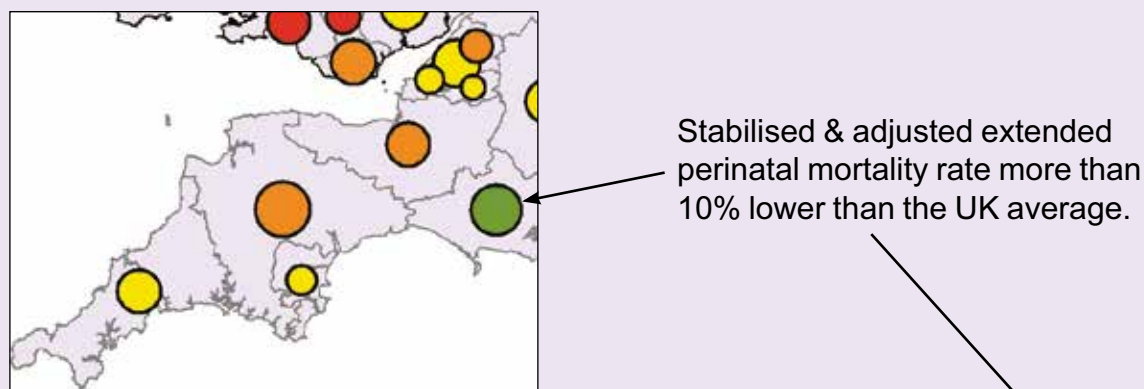
MBRRACE-UK Recommendation

NHS England, NHS Scotland, NHS Wales, Health and Social Care in Northern Ireland, in conjunction with professional bodies and national healthcare advisors responsible for clinical standards in the relevant specialties (where in existence) should establish targets that reflect each country's aspirations for rates of stillbirths, neonatal deaths, and extended perinatal deaths against which services can be assessed in future.

The size of the circles on each map represents the number of births in the population covered by the particular organisation, although there is a minimum size in order that the colour can be adequately seen.

The accompanying tables show both the crude and the stabilised & adjusted rate for stillbirth, neonatal death, and extended perinatal death for each organisation. In order to avoid the effect of any local policy decisions regarding the classification of live and stillbirth at the extremes of viability, particular emphasis is given to the extended perinatal mortality rate and each organisation has been colour coded based on their stabilised & adjusted extended perinatal mortality rate in an identical manner to the maps.

Figure 2: Example of the presentation of the mortality rates in this report



Organisation	Total births [§]	Rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [‡]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Dorset	7,377	2.58	3.61 (2.87 to 4.80)	0.95	1.50 (1.09 to 2.20)	3.52	5.09 (4.06 to 6.39)	●
Northern, Eastern and West Devon	9,067	4.52	4.57 (3.71 to 5.96)	1.55	1.71 (1.23 to 2.50)	6.07	6.29 (5.30 to 7.69)	●
South Devon and Torbay	2,721	*	4.09 (3.10 to 5.51)	*	1.57 (1.07 to 2.47)	4.41	5.63 (4.47 to 7.31)	●

2.9 Suppression of rates calculated when there are few deaths

In order to avoid disclosure of information which could potentially identify individuals, crude mortality rates based on a very small number of deaths have not been included, in line with guidance from ONS [1] and the Government Statistical Service (GSS) [2]. Suppressed mortality rates are shown as a white dot ○ on the maps and in the tables where appropriate.

References

1. Office for National Statistics. Disclosure control guidance for birth and death statistics. Available online at: <http://www.ons.gov.uk/ons/guide-method/best-practice/disclosure-control-policy-for-birth-and-death-statistics/index.html>. ONS, 2007-2013.
2. Government Statistical Service. GSS/GSR Disclosure Control Guidance for Tables Produced from Administrative Sources. Available online at: <http://www.ons.gov.uk/ons/guide-method/best-practice/disclosure-control-policy-for-tables/index.html>. ONS, 2014.



3. Perinatal death in 2014 in the UK

The data in this chapter relates to the information available for the UK about the rates of stillbirth, neonatal death, and extended perinatal death (stillbirth and neonatal deaths combined) for births that occurred in 2014 at 24⁺⁰ weeks gestational age or later (excluding terminations of pregnancy).

Two perinatal mortality surveillance reports were produced for births in 2013:

1. In June 2015 data for the various commissioning and administrative organisations was published, together with the service delivery organisations based on the place of birth reported by the ODN for England, Health Board for Scotland and Wales, and Health and Social Care Trust for Northern Ireland [1].
2. In December 2015 the equivalent data was made available in a supplementary report for individual Trusts in England, together with Health Boards in Scotland and Wales, and Health and Social Care Trusts in Northern Ireland [2].

For deaths arising from births in 2014 it has been possible to produce all of this information in a single report. Within this chapter we have included data for:

- the UK as a whole, the four countries of the UK and the Crown Dependencies;
- the various commissioning organisations across the UK based on the postcode of the mother's place of residence at time of delivery;
- the various Trusts and Health Boards across the UK who provide perinatal care; deaths have been allocated based on the Trust or Health Board in which the baby was born.

Additional analyses of the 2014 deaths relating to other organisational structures can be found in Appendix A3 of this report:

- Neonatal Networks based on the place of birth (Appendix A3.1);
- Local Authority based on the postcode of the mother's residence at time of delivery (Appendix A3.2).

3.1 Mortality rates for the UK as a whole, the four countries of the UK, and the Crown Dependencies.

The data shown in Table 1 and Table 2, below, is derived from a number of sources in addition to the information submitted via the MBRRACE-UK reporting system: ONS, the birth notification service known previously as NN4B, NRS, ISD, NISRA, Bailiwick of Guernsey (Health and Social Services Department), and the Bailiwick of Jersey (Health Intelligence Unit).

In the UK in 2014 the number of births at 24⁺⁰ weeks or greater gestational age (excluding terminations of pregnancy) was slightly more than in 2013: 782,311 births in 2014 compared with 781,932 in 2013. However, there was a small decrease in both the number of stillbirths (3,252 in 2014 compared with 3,286 in 2013) and neonatal deaths (1,381 in 2014 compared with 1,436 in 2013). This led to a

decrease in the reported mortality rates for 2014; the crude extended perinatal mortality rate was 5.92 per 1,000 total births (6.04 in 2013), comprising 4.16 stillbirths per 1,000 total births (4.20 in 2013) and 1.77 neonatal deaths per 1,000 live births (1.84 in 2013).

Table 1 shows the number of stillbirths, neonatal deaths and extended perinatal deaths for the UK and Crown Dependencies as a whole and separately for the four countries of the UK and the Crown Dependencies by country of residence. The associated mortality rates are shown in Table 2. The data for Scotland contained in these tables has not been affected by the loss of some data items as described in Chapter 2. Of note, the rate of intrapartum stillbirth in Wales in 2014 was significantly higher than that observed in England, Northern Ireland and the UK as a whole. In Northern Ireland the stillbirth rate decreased, having been above the UK average (4.33 per 1,000 total births) in 2013, to below the 2014 UK average (3.76 per 1,000 total births). However, the neonatal mortality rate for Northern Ireland was significantly higher than that observed in both England and the UK as a whole in 2014. It is important to note that stillbirth and neonatal mortality rates are affected by differences in the law in Northern Ireland relating to termination of pregnancy, with more babies with major congenital anomalies being carried into the later stages of pregnancy and resulting in early neonatal deaths (see Chapter 4). The number of babies born in the Crown Dependencies is too few to permit reliable comparison with the four countries of the UK.

Table 1: Number of births, stillbirths, neonatal deaths, and extended perinatal deaths by country of residence: United Kingdom and Crown Dependencies, for births in 2014

Number*	UK [^]	England	Scotland	Wales	Northern Ireland [°]	Crown Dependencies
Total births	782,311	665,022	56,622	33,751	24,498	2,418
Live births	779,059	662,233	56,413	33,592	24,406	2,415
Stillbirths	3,252	2,789	209	159	92	3
<i>Antepartum</i>	2,853	2,455	183	130	82	3
<i>Intrapartum</i>	275	230	17	23	5	0
<i>Unknown timing</i>	124	104	9	6	5	0
Neonatal deaths	1,381	1,144	105	56	73	3
<i>Early neonatal deaths</i>	956	778	76	44	55	3
<i>Late neonatal deaths</i>	425	366	29	12	18	0
Perinatal deaths	4,208	3,567	285	203	147	6
Extended perinatal deaths	4,633	3,933	314	215	165	6

* excluding terminations of pregnancy and births <24⁺⁰ weeks gestational age

° different laws exist in Northern Ireland for the termination of pregnancy

[^] including the Crown Dependencies

Data sources: MBRRACE-UK, ONS, NN4B, NRS, ISD, NIMATS, States of Guernsey, States of Jersey

Table 2: Stillbirth, neonatal, and extended perinatal mortality rates (95% confidence intervals (CIs)) by country of residence: United Kingdom and Crown Dependencies, for births in 2014

Rate per 1,000 births*	UK [^]	England	Scotland	Wales	Northern Ireland [°]	Crown Dependencies
Stillbirths[†]	4.16 (4.01 to 4.30)	4.19 (4.04 to 4.35)	3.69 (3.19 to 4.19)	4.71 (3.98 to 5.44)	3.76 (2.99 to 4.52)	1.24 (0.00 to 2.64)
<i>Antepartum[†]</i>	3.65 (3.51 to 3.78)	3.69 (3.55 to 3.84)	3.23 (2.76 to 3.70)	3.85 (3.19 to 4.51)	3.35 (2.62 to 4.07)	1.24 (0.00 to 2.64)
<i>Intrapartum[†]</i>	0.35 (0.31 to 0.39)	0.35 (0.30 to 0.39)	0.30 (0.16 to 0.44)	0.68 (0.40 to 0.96)	0.20 (0.03 to 0.38)	0 (0.00 to 1.24)
<i>Unknown timing[†]</i>	0.16 (0.13 to 0.19)	0.16 (0.13 to 0.19)	0.16 (0.06 to 0.26)	0.18 (0.04 to 0.32)	0.20 (0.03 to 0.38)	0 (0.00 to 1.24)
Neonatal deaths[‡]	1.77 (1.68 to 1.87)	1.73 (1.63 to 1.83)	1.86 (1.51 to 2.22)	1.67 (1.23 to 2.10)	2.99 (2.31 to 3.68)	1.24 (0.00 to 2.65)
<i>Early neonatal deaths[‡]</i>	1.23 (1.15 to 1.30)	1.17 (1.09 to 1.26)	1.35 (1.04 to 1.65)	1.31 (0.92 to 1.70)	2.25 (1.66 to 2.85)	1.24 (0.00 to 2.65)
<i>Late neonatal deaths[‡]</i>	0.55 (0.49 to 0.60)	0.55 (0.50 to 0.61)	0.51 (0.33 to 0.70)	0.36 (0.16 to 0.56)	0.74 (0.40 to 1.08)	0 (0.00 to 1.24)
Perinatal deaths[†]	5.38 (5.22 to 5.54)	5.36 (5.19 to 5.54)	5.03 (4.45 to 5.62)	6.01 (5.19 to 6.84)	6.00 (5.03 to 6.97)	2.48 (0.50 to 4.46)
Extended perinatal deaths[†]	5.92 (5.75 to 6.09)	5.91 (5.73 to 6.10)	5.55 (4.93 to 6.16)	6.37 (5.52 to 7.22)	6.74 (5.71 to 7.76)	2.48 (0.50 to 4.46)

[†] per 1,000 total births

[‡] per 1,000 live births

* excluding terminations of pregnancy and births <24⁺⁰ weeks gestational age

[°] different laws exist in Northern Ireland for the termination of pregnancy

[^] including the Crown Dependencies

Data sources: MBRRACE-UK, NN4B, ONS, NRS, ISD, NIMATS, States of Guernsey, States of Jersey

Table 3 and Table 4 set out the various categories of stillbirth and neonatal death based on the whole UK data but subdivided by gestational age at birth. This data clearly illustrates the marked impact of preterm birth in relation to both stillbirth and neonatal death rates in the UK. Preterm birth is a particular problem for the UK. Government initiatives to reduce stillbirth rates, if they are to succeed, will almost certainly need to focus on ways of reducing the number of preterm births.

Table 3: Number of births, stillbirths, neonatal deaths, and extended perinatal deaths by gestational age at birth: United Kingdom and Crown Dependencies, for births in 2014

Number*	UK [^]	Gestational age at birth (weeks)				
		24 ⁺⁰ -27 ⁺⁶	28 ⁺⁰ -31 ⁺⁶	32 ⁺⁰ -36 ⁺⁶	37 ⁺⁰ -41 ⁺⁶	≥42 ⁺⁰
Total births	782,773	3,192	6,469	49,385	701,852	21,875
Live births	779,548	2,470	5,932	48,583	700,709	21,854
Stillbirths	3,225	722	537	802	1,143	21
<i>Antepartum</i>	2,831	590	490	740	995	16
<i>Intrapartum</i>	274	96	35	36	103	4
<i>Unknown timing</i>	120	36	12	26	45	1
Neonatal deaths	1,374	384	182	305	493	10
<i>Early neonatal deaths</i>	955	264	135	225	322	9
<i>Late neonatal deaths</i>	419	120	47	80	171	1
Perinatal deaths	4,180	986	672	1,027	1,465	30
Extended perinatal deaths	4,599	1,106	719	1,107	1,636	31

* excluding terminations of pregnancy, births <24⁺⁰ weeks gestational age and deaths with unknown gestation

[^] including the Crown Dependencies

Data sources: MBRRACE-UK, ONS, NN4B, NRS, ISD, NIMATS, States of Guernsey, States of Jersey

Table 4: Stillbirth, neonatal, and extended perinatal mortality rates (95% CIs) by gestational age at birth: United Kingdom and Crown Dependencies, for births in 2014

Rate per 1,000 births*	UK [^]	Gestational age at birth (weeks)				
		24 ⁺⁰ -27 ⁺⁶	28 ⁺⁰ -31 ⁺⁶	32 ⁺⁰ -36 ⁺⁶	37 ⁺⁰ -41 ⁺⁶	≥42 ⁺⁰
Stillbirths[†]	4.12 (3.98 to 4.26)	226.19 (211.68 to 240.70)	83.01 (76.29 to 89.73)	16.24 (15.12 to 17.35)	1.63 (1.53 to 1.72)	0.96 (0.55 to 1.37)
<i>Antepartum[†]</i>	3.62 (3.48 to 3.75)	184.84 (171.37 to 198.30)	75.75 (69.30 to 82.19)	14.98 (13.91 to 16.06)	1.42 (1.33 to 1.51)	0.73 (0.37 to 1.09)
<i>Intrapartum[†]</i>	0.35 (0.31 to 0.39)	30.08 (24.15 to 36.00)	5.41 (3.62 to 7.20)	0.73 (0.49 to 0.97)	0.15 (0.12 to 0.18)	0.18 (0.00 to 0.36)
<i>Unknown timing[†]</i>	0.15 (0.13 to 0.18)	11.28 (7.61 to 14.94)	1.86 (0.81 to 2.90)	0.53 (0.32 to 0.73)	0.06 (0.05 to 0.08)	0.05 (0.00 to 0.14)
Neonatal deaths[‡]	1.76 (1.67 to 1.86)	155.47 (141.18 to 169.76)	30.68 (26.29 to 35.07)	6.28 (5.58 to 6.98)	0.70 (0.64 to 0.77)	0.46 (0.17 to 0.74)
<i>Early neonatal deaths[‡]</i>	1.23 (1.15 to 1.30)	106.88 (94.70 to 119.07)	22.76 (18.96 to 26.55)	4.63 (4.03 to 5.23)	0.46 (0.41 to 0.51)	0.41 (0.14 to 0.68)
<i>Late neonatal deaths[‡]</i>	0.54 (0.49 to 0.59)	48.58 (40.10 to 57.06)	7.92 (5.67 to 10.18)	1.65 (1.29 to 2.01)	0.24 (0.21 to 0.28)	0.05 (0.00 to 0.14)
Perinatal deaths[†]	5.34 (5.18 to 5.50)	308.90 (292.87 to 324.93)	103.88 (96.44 to 111.32)	20.80 (19.54 to 22.05)	2.09 (1.98 to 2.19)	1.37 (0.88 to 1.86)
Extended perinatal deaths[†]	5.88 (5.71 to 6.04)	346.49 (329.98 to 363.00)	111.15 (103.49 to 118.80)	22.42 (21.11 to 23.72)	2.33 (2.22 to 2.44)	1.42 (0.92 to 1.92)

[†] per 1,000 total births

[‡] per 1,000 live births

* excluding terminations of pregnancy, births <24⁺⁰ weeks gestational age and deaths with unknown gestation

[^] including the Crown Dependencies

Data sources: MBRRACE-UK, NN4B, ONS, NRS, ISD, NIMATS, States of Guernsey, States of Jersey

3.2 Mortality rates by NHS organisation responsible for population based care commissioning

As set out in Section 2.6, an important aim of this report is to present data that has been adjusted to take account of fundamental differences between the parts of the country being compared, e.g. very deprived versus very affluent areas, or services being compared, e.g. organisations treating women identified as low risk versus those providing high risk care.

The geographical distribution of stillbirth, neonatal, and extended perinatal mortality rates by CCG (England), Health Board (Scotland and Wales), Health and Social Care Trust (Northern Ireland), and Crown Dependency are presented in a series of maps (Figure 3 to Figure 8). A pair of maps is presented for each mortality outcome: one presents the crude rate and the other the stabilised & adjusted rate. The colour coding for each organisation represents the extent to which it is above or below the UK average mortality rate based on the approach described in Section 2.8.

The maps are followed by Table 5 which gives the numeric values of the crude and the stabilised & adjusted rates for each of the relevant organisations.

The process of stabilisation and adjustment has a major effect in terms of smoothing apparently extreme (high or very low) crude mortality rates by taking into account known influences on stillbirth and neonatal mortality. Commissioning organisations will need to work with their relevant care providers to try to understand more fully the underlying reasons for their mortality rates in the context of their data quality, population characteristics and quality of care provision.

There are also some organisations where mortality rates increase as a result of the stabilisation and adjustment. While some of these will be organisations with low crude mortality rates just by chance, some will be organisations where rates are relatively low but where the characteristics of their population are such that rates should be even lower, e.g. they serve a low risk population.

Figure 3: Crude stillbirth rates by Clinical Commissioning Group (England), Health Board (Scotland and Wales), Local Commissioning Group (Northern Ireland), and Crown Dependency based on postcode of mother's residence at time of delivery: United Kingdom and Crown Dependencies, for births in 2014

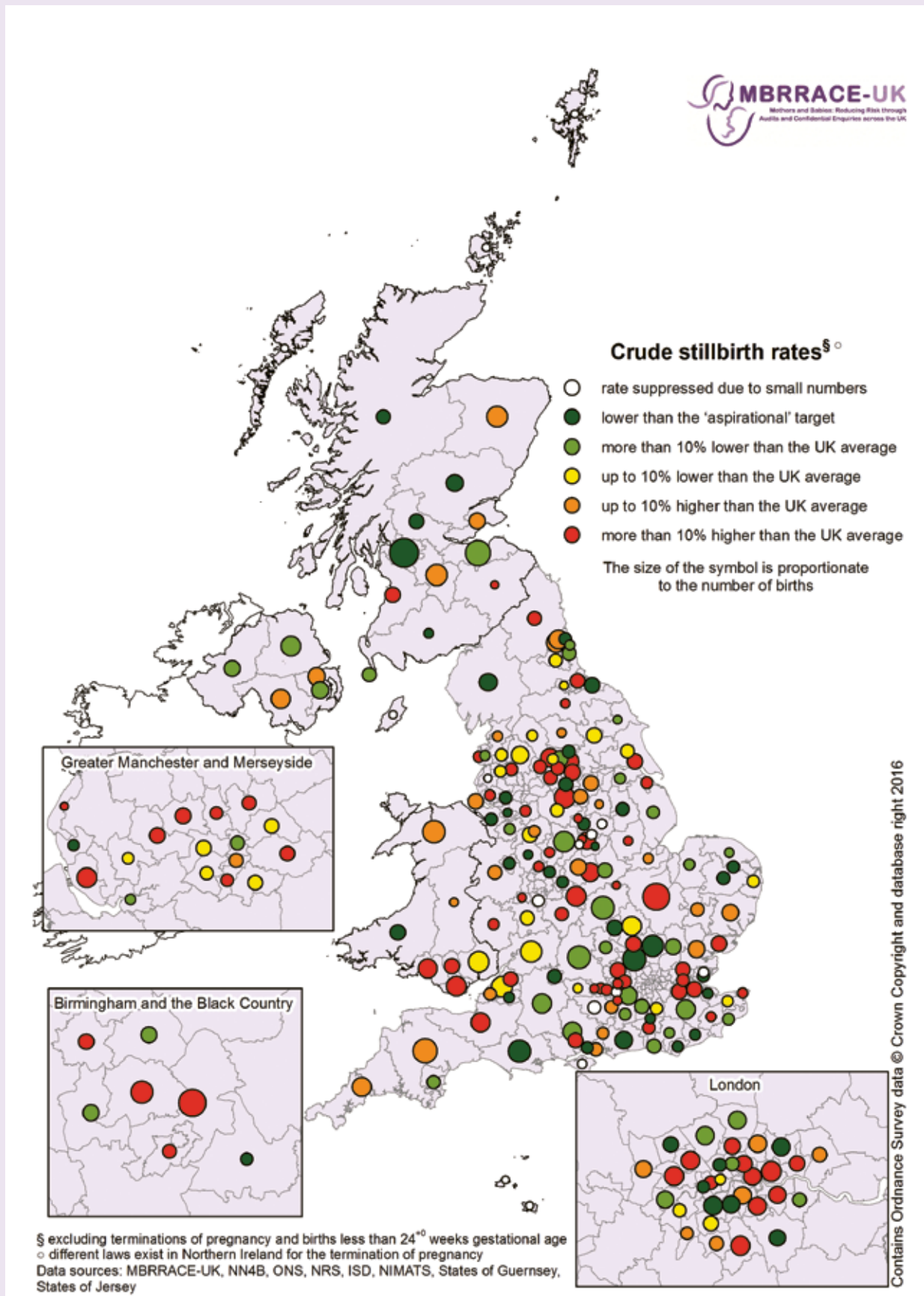


Figure 4: Stabilised & adjusted stillbirth rates by Clinical Commissioning Group (England), Health Board (Scotland and Wales), Local Commissioning Group (Northern Ireland), and Crown Dependency based on postcode of mother's residence at time of delivery: United Kingdom and Crown Dependencies, for births in 2014

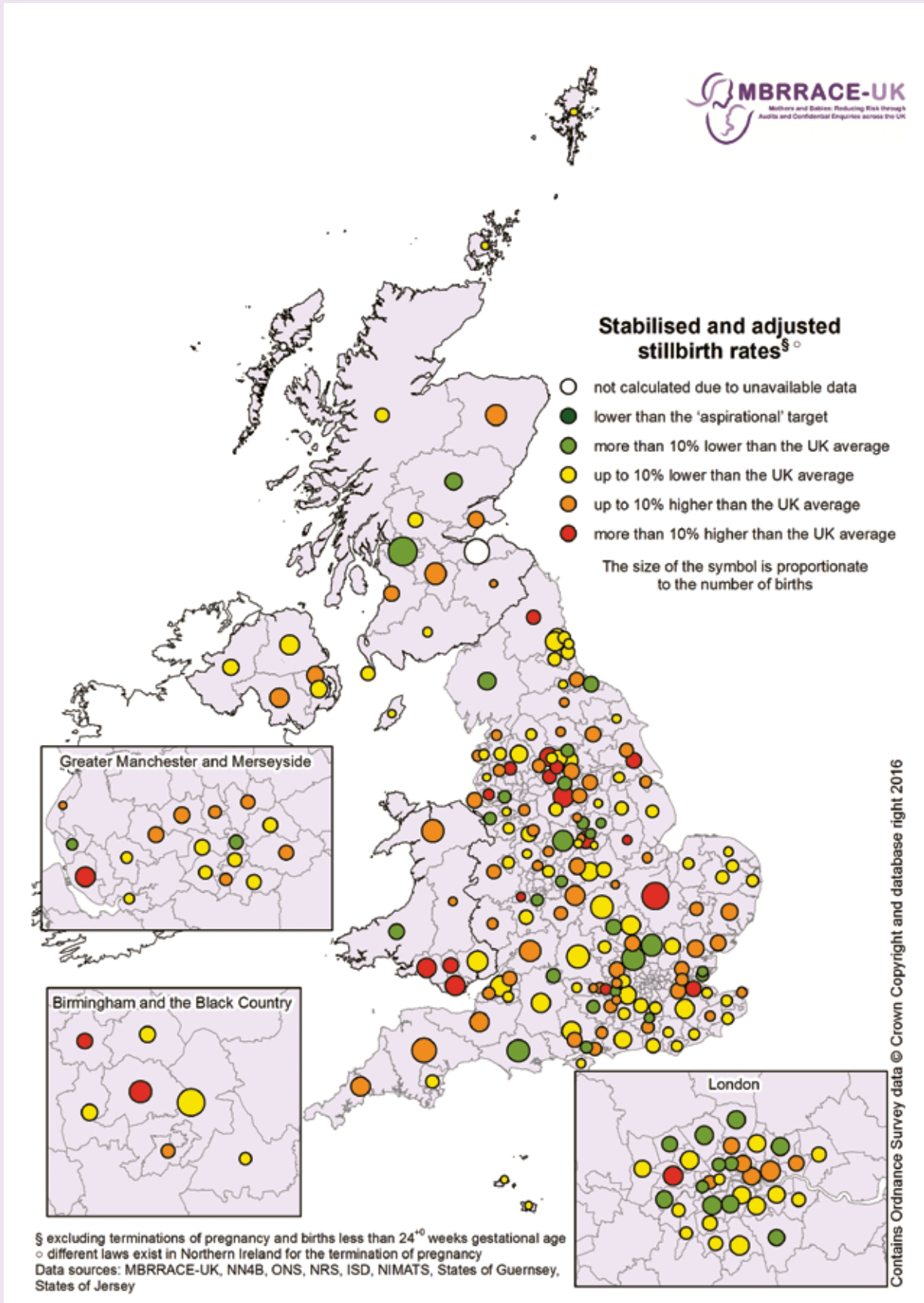


Figure 5: Crude neonatal mortality rates by Clinical Commissioning Group (England), Health Board (Scotland and Wales), Local Commissioning Group (Northern Ireland), and Crown Dependency based on postcode of mother's residence: United Kingdom and Crown Dependencies, for births in 2014

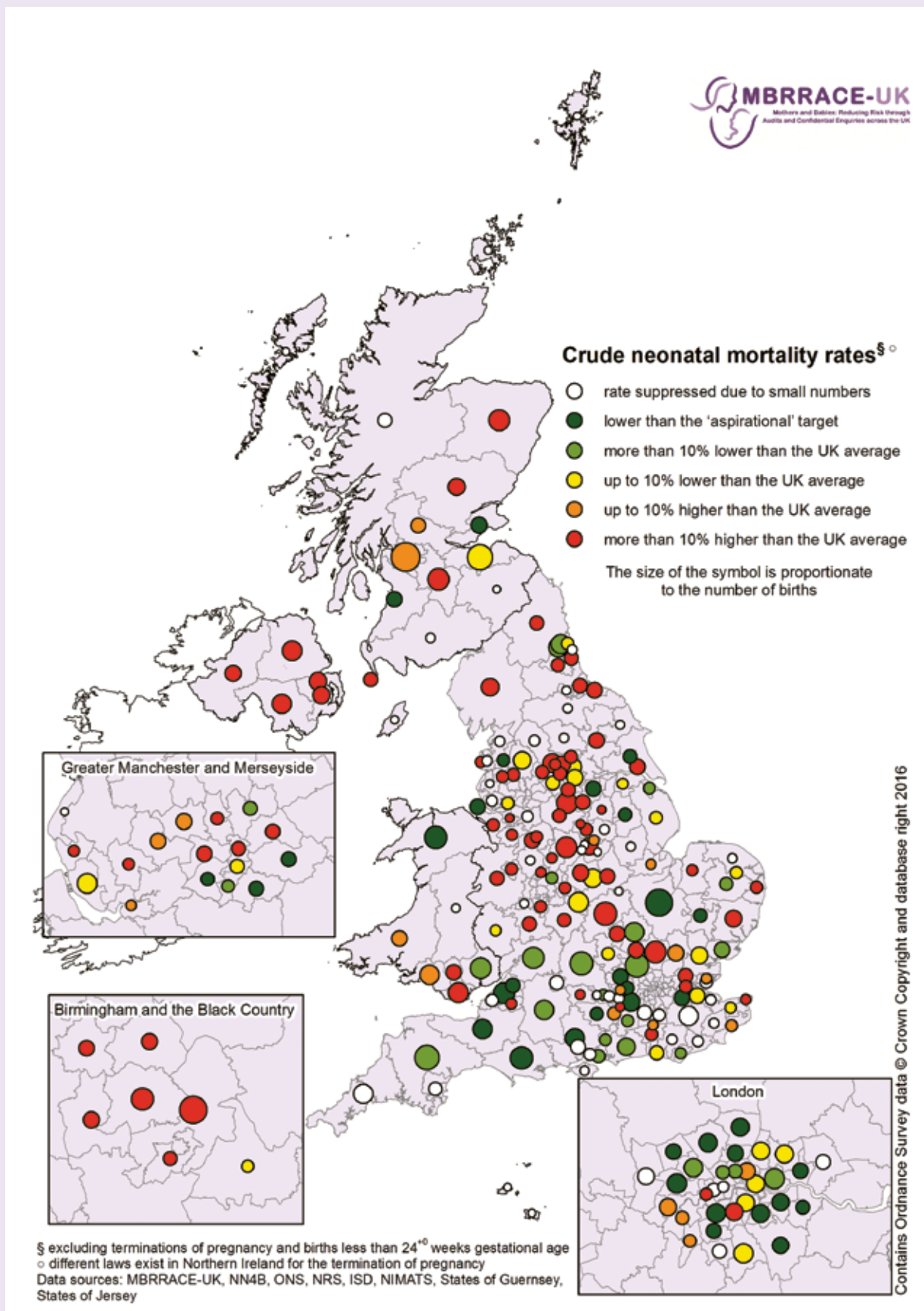


Figure 6: Stabilised & adjusted neonatal mortality rates by Clinical Commissioning Group (England), Health Board (Scotland and Wales), Local Commissioning Group (Northern Ireland), and Crown Dependency based on postcode of mother's residence: United Kingdom and Crown Dependencies, for births in 2014

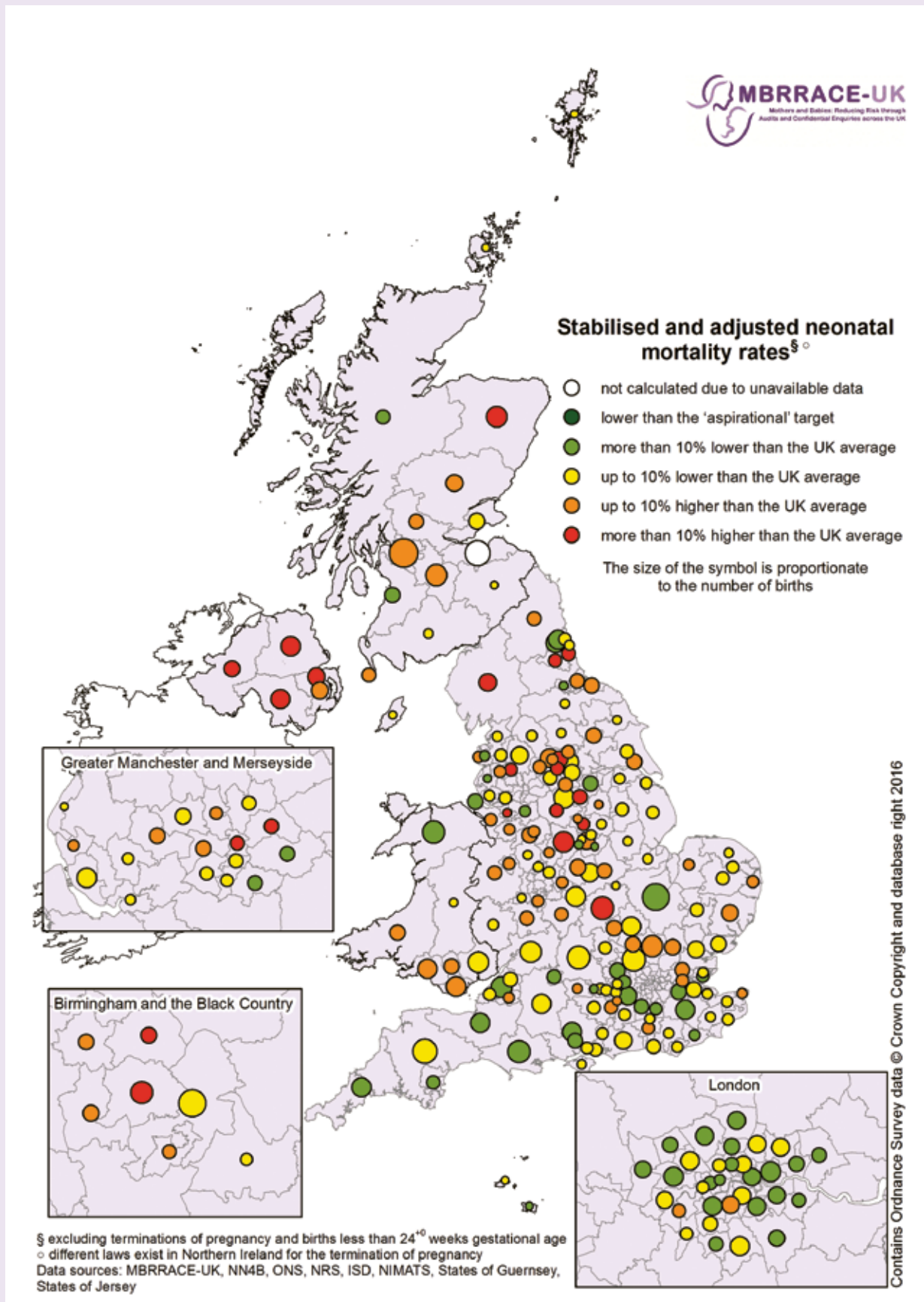


Figure 7: Crude extended perinatal mortality rates by Clinical Commissioning Group (England), Health Board (Scotland and Wales), Local Commissioning Group (Northern Ireland), and Crown Dependency based on postcode of mother's residence: United Kingdom and Crown Dependencies, for births in 2014

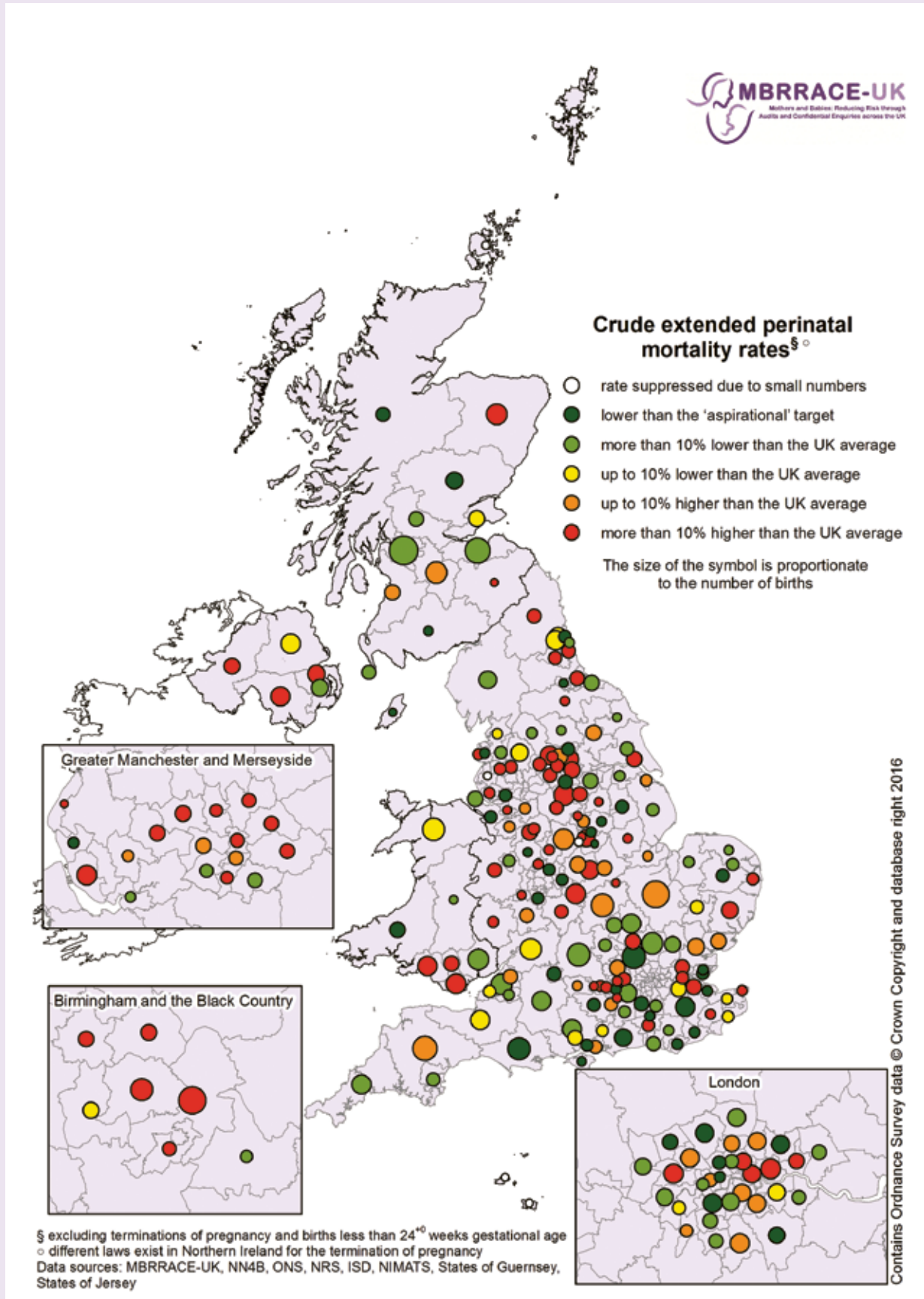


Figure 8: Stabilised & adjusted extended perinatal mortality rates by Clinical Commissioning Group (England), Health Board (Scotland and Wales), Local Commissioning Group (Northern Ireland), and Crown Dependency based on postcode of mother's residence: United Kingdom and Crown Dependencies, for births in 2014

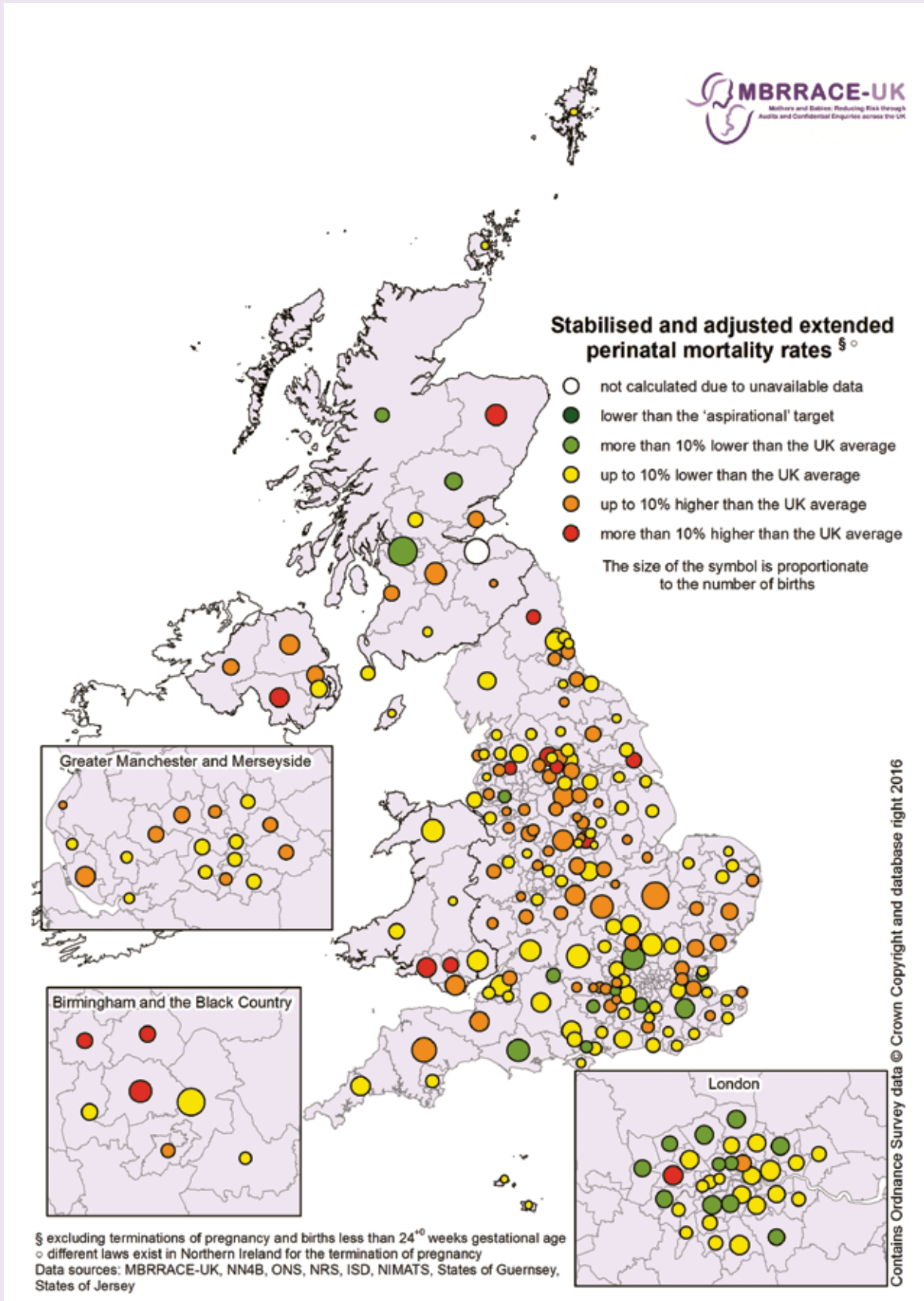


Table 5: Crude and stabilised & adjusted stillbirth, neonatal, and extended perinatal mortality rates by Clinical Commissioning Group (England), Health Board (Scotland and Wales), Local Commissioning Group (Northern Ireland), and Crown Dependency based on postcode of mother's residence at time of delivery: United Kingdom and Crown Dependencies, for births in 2014

Organisation	Total births [§]	Rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [‡]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
ENGLAND								
Airedale, Wharfedale and Craven	1,690	*	4.11 (3.08 to 5.41)	*	1.67 (1.17 to 2.65)	5.33	5.78 (4.57 to 7.42)	●
Ashford	1,486	*	4.31 (3.31 to 5.92)	*	1.69 (1.18 to 2.59)	6.73	6.03 (4.73 to 7.87)	●
Aylesbury Vale	2,369	3.38	3.96 (3.05 to 5.35)	1.69	1.73 (1.23 to 2.58)	5.07	5.72 (4.56 to 7.31)	●
Barking and Dagenham	3,593	5.84	4.23 (3.37 to 5.66)	1.12	1.53 (1.03 to 2.26)	6.96	5.72 (4.57 to 7.25)	●
Barnet	5,268	3.04	3.64 (2.83 to 4.85)	0.76	1.46 (0.98 to 2.23)	3.80	5.06 (4.06 to 6.68)	●
Barnsley	2,796	1.79	3.62 (2.68 to 4.89)	2.15	1.81 (1.27 to 2.80)	3.93	5.46 (4.27 to 7.02)	●
Basildon and Brentwood	3,317	5.13	4.41 (3.44 to 5.96)	2.42	1.88 (1.32 to 2.91)	7.54	6.35 (5.17 to 8.16)	●
Bassetlaw	1,194	4.19	4.16 (3.11 to 5.86)	3.36	1.89 (1.29 to 3.01)	7.54	6.13 (4.81 to 7.97)	●
Bath and North East Somerset	1,732	2.31	3.89 (2.84 to 5.31)	2.89	1.89 (1.34 to 2.86)	5.20	5.86 (4.52 to 7.61)	●
Bedfordshire	5,414	3.88	4.11 (3.23 to 5.36)	1.48	1.69 (1.23 to 2.48)	5.36	5.81 (4.70 to 7.23)	●
Bexley	3,052	3.60	3.88 (3.04 to 5.18)	0.99	1.57 (1.08 to 2.39)	4.59	5.44 (4.35 to 6.96)	●
Birmingham CrossCity	11,177	4.74	4.05 (3.34 to 5.11)	2.07	1.73 (1.32 to 2.41)	6.80	5.79 (4.93 to 7.04)	●
Birmingham South and Central	2,962	6.41	4.49 (3.46 to 6.00)	3.06	1.91 (1.39 to 2.98)	9.45	6.47 (5.21 to 8.23)	●
Blackburn with Darwen	2,229	8.97	4.92 (3.66 to 6.93)	3.62	2.01 (1.38 to 3.19)	12.56	7.03 (5.49 to 9.41)	●
Blackpool	1,834	6.00	4.42 (3.34 to 5.99)	3.29	1.93 (1.36 to 3.11)	9.27	6.45 (5.04 to 8.52)	●
Bolton	3,788	5.81	4.48 (3.51 to 5.94)	1.86	1.72 (1.22 to 2.56)	7.66	6.22 (5.03 to 7.90)	●
Bracknell and Ascot	1,649	*	3.71 (2.65 to 5.02)	*	1.62 (1.10 to 2.59)	1.82	5.32 (4.15 to 6.85)	●
Bradford City	1,744	4.01	3.89 (2.94 to 5.28)	3.45	1.87 (1.27 to 2.79)	7.45	5.82 (4.64 to 7.56)	●
Bradford Districts	5,109	6.46	4.70 (3.72 to 6.23)	2.36	1.85 (1.36 to 2.64)	8.81	6.60 (5.42 to 8.26)	●

Organisation	Total births [§]	Rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Brent	5,108	4.89	3.98 (3.15 to 5.23)	1.57	1.64 (1.15 to 2.40)	6.46	5.62 (4.62 to 7.04)	●
Brighton and Hove	2,990	3.01	3.83 (2.87 to 5.20)	1.68	1.71 (1.24 to 2.57)	4.68	5.56 (4.42 to 7.25)	●
Bristol	6,467	4.02	4.03 (3.17 to 5.25)	1.09	1.50 (1.07 to 2.21)	5.10	5.49 (4.51 to 6.94)	●
Bromley	4,105	2.92	3.73 (2.92 to 5.01)	0.73	1.49 (1.01 to 2.30)	3.65	5.18 (4.10 to 6.49)	●
Bury	2,343	5.98	4.50 (3.41 to 6.07)	2.15	1.81 (1.26 to 2.67)	8.11	6.36 (5.20 to 8.17)	●
Calderdale	2,548	5.10	4.33 (3.29 to 5.84)	2.37	1.83 (1.28 to 2.82)	7.46	6.22 (4.86 to 8.21)	●
Cambridgeshire and Peterborough	10,786	4.73	4.62 (3.71 to 5.82)	1.21	1.55 (1.15 to 2.19)	5.93	6.14 (5.14 to 7.57)	●
Camden	2,710	2.21	3.59 (2.73 to 4.86)	1.48	1.63 (1.15 to 2.54)	3.69	5.22 (4.02 to 6.77)	●
Cannock Chase	1,504	5.32	4.34 (3.36 to 5.91)	2.01	1.77 (1.21 to 2.84)	7.31	6.16 (4.88 to 8.17)	●
Canterbury and Coastal	1,795	3.90	4.12 (3.05 to 5.59)	1.68	1.73 (1.18 to 2.66)	5.57	5.88 (4.67 to 7.67)	●
Castle Point and Rochford	1,657	*	3.74 (2.83 to 5.23)	*	1.75 (1.22 to 2.75)	3.02	5.52 (4.37 to 7.19)	●
Central London (Westminster)	1,821	*	3.99 (2.97 to 5.42)	*	1.49 (0.99 to 2.33)	3.84	5.43 (4.28 to 7.07)	●
Central Manchester	2,900	4.48	3.93 (3.02 to 5.39)	1.73	1.64 (1.19 to 2.42)	6.21	5.56 (4.53 to 7.07)	●
Chiltern	3,676	4.90	4.30 (3.35 to 5.77)	1.09	1.60 (1.12 to 2.52)	5.98	5.89 (4.70 to 7.51)	●
Chorley and South Ribble	1,969	4.06	4.18 (3.20 to 5.77)	3.06	1.94 (1.31 to 3.01)	7.11	6.21 (4.89 to 8.02)	●
City and Hackney	4,476	6.26	4.49 (3.52 to 5.95)	1.80	1.66 (1.20 to 2.40)	8.04	6.14 (4.98 to 7.74)	●
Coastal West Sussex	4,794	2.71	3.79 (2.92 to 5.04)	1.46	1.71 (1.21 to 2.57)	4.17	5.51 (4.41 to 7.07)	●
Corby	920	*	4.35 (3.25 to 6.16)	*	1.76 (1.20 to 2.71)	8.70	6.15 (4.79 to 8.07)	●
Coventry and Rugby	5,859	5.12	4.39 (3.52 to 5.71)	1.72	1.70 (1.25 to 2.48)	6.83	6.09 (5.02 to 7.44)	●
Crawley	1,621	1.85	3.75 (2.77 to 5.33)	1.85	1.75 (1.18 to 2.67)	3.70	5.53 (4.33 to 7.23)	●
Croydon	5,678	4.76	3.99 (3.18 to 5.20)	1.77	1.68 (1.17 to 2.40)	6.52	5.67 (4.69 to 7.11)	●
Cumbria	4,818	2.08	3.57 (2.69 to 4.73)	2.91	2.12 (1.47 to 3.30)	4.98	5.76 (4.71 to 7.22)	●
Darlington	1,229	*	4.12 (3.09 to 5.67)	*	1.58 (1.05 to 2.39)	4.07	5.67 (4.38 to 7.35)	●

Organisation	Total births [§]	Rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Dartford, Gravesham and Swanley	3,477	4.60	4.22 (3.25 to 5.68)	1.16	1.61 (1.11 to 2.38)	5.75	5.82 (4.75 to 7.55)	●
Doncaster	3,574	4.48	4.24 (3.38 to 5.72)	0.84	1.54 (1.07 to 2.28)	5.32	5.75 (4.56 to 7.40)	●
Dorset	7,377	2.58	3.61 (2.87 to 4.80)	0.95	1.50 (1.09 to 2.20)	3.52	5.09 (4.06 to 6.39)	●
Dudley	3,773	3.45	3.92 (2.99 to 5.30)	2.39	1.87 (1.30 to 2.92)	5.83	5.84 (4.75 to 7.37)	●
Durham Dales, Easington and Sedgfield	2,866	3.14	3.91 (2.99 to 5.25)	2.10	1.79 (1.24 to 2.72)	5.23	5.74 (4.50 to 7.30)	●
Ealing	5,532	8.32	5.28 (4.15 to 7.02)	0.91	1.44 (0.99 to 2.12)	9.22	6.62 (5.40 to 8.21)	●
East Lancashire	4,723	4.02	4.04 (3.18 to 5.37)	1.70	1.72 (1.24 to 2.55)	5.72	5.78 (4.65 to 7.16)	●
East Leicestershire and Rutland	3,276	3.66	4.08 (3.14 to 5.52)	2.45	1.93 (1.32 to 3.03)	6.11	6.08 (4.94 to 7.85)	●
East Riding of Yorkshire	2,837	3.88	4.17 (3.16 to 5.59)	1.06	1.63 (1.13 to 2.51)	4.93	5.79 (4.60 to 7.40)	●
East Staffordshire	1,513	4.63	4.20 (3.25 to 5.57)	2.66	1.84 (1.25 to 2.91)	7.27	6.10 (4.84 to 7.95)	●
East Surrey	2,272	*	4.13 (3.26 to 5.60)	*	1.55 (1.05 to 2.37)	4.40	5.66 (4.53 to 7.46)	●
East and North Hertfordshire	6,734	2.82	3.67 (2.86 to 4.84)	2.08	1.90 (1.40 to 2.89)	4.90	5.60 (4.59 to 6.95)	●
Eastbourne, Hailsham and Seaford	1,877	2.66	3.91 (2.93 to 5.32)	1.60	1.72 (1.20 to 2.66)	4.26	5.66 (4.41 to 7.35)	●
Eastern Cheshire	1,908	*	4.50 (3.37 to 6.23)	*	1.59 (1.05 to 2.40)	6.29	6.06 (4.79 to 7.83)	●
Enfield	4,851	3.50	3.67 (2.86 to 4.90)	0.83	1.44 (0.98 to 2.17)	4.33	5.06 (3.94 to 6.37)	●
Erewash	1,147	*	3.87 (2.91 to 5.18)	*	1.59 (1.04 to 2.47)	*	5.44 (4.19 to 7.18)	●
Fareham and Gosport	1,976	*	3.73 (2.69 to 5.02)	*	1.65 (1.10 to 2.37)	2.53	5.38 (4.07 to 6.94)	●
Fylde & Wyre	1,460	*	4.06 (3.07 to 5.42)	*	1.56 (1.03 to 2.40)	3.42	5.60 (4.35 to 7.32)	●
Gloucestershire	6,653	3.91	4.21 (3.30 to 5.46)	1.51	1.70 (1.25 to 2.45)	5.41	5.92 (4.82 to 7.41)	●
Great Yarmouth and Waveney	2,275	3.96	4.09 (3.13 to 5.60)	2.65	1.87 (1.30 to 2.98)	6.59	6.03 (4.80 to 7.67)	●
Greater Huddersfield	2,857	6.65	4.69 (3.57 to 6.25)	1.76	1.72 (1.21 to 2.54)	8.40	6.43 (5.21 to 8.49)	●

Organisation	Total births [§]	Rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Greater Preston	2,457	4.07	4.09 (3.11 to 5.44)	1.23	1.65 (1.15 to 2.51)	5.29	5.74 (4.59 to 7.35)	●
Greenwich	4,394	4.78	4.03 (3.21 to 5.34)	1.14	1.52 (1.07 to 2.27)	5.92	5.52 (4.52 to 6.93)	●
Guildford and Waverley	2,111	3.32	4.03 (3.16 to 5.41)	1.43	1.70 (1.16 to 2.49)	4.74	5.74 (4.48 to 7.42)	●
Halton	1,561	3.20	3.99 (2.93 to 5.50)	1.93	1.75 (1.22 to 2.79)	5.12	5.77 (4.54 to 7.53)	●
Hambleton, Richmondshire and Whitby	1,381	*	4.50 (3.34 to 6.34)	*	1.71 (1.17 to 2.58)	7.97	6.23 (4.84 to 8.02)	●
Hammersmith and Fulham	2,457	2.44	3.67 (2.72 to 5.07)	2.04	1.73 (1.20 to 2.61)	4.48	5.42 (4.26 to 7.00)	●
Hardwick	1,164	6.87	4.46 (3.37 to 6.07)	2.60	1.81 (1.25 to 2.81)	9.45	6.33 (4.96 to 8.31)	●
Haringey	4,029	5.21	4.23 (3.32 to 5.53)	1.25	1.56 (1.09 to 2.32)	6.45	5.77 (4.75 to 7.11)	●
Harrogate and Rural District	1,431	*	4.18 (3.19 to 5.80)	*	1.64 (1.16 to 2.49)	4.89	5.82 (4.62 to 7.37)	●
Harrow	3,546	2.82	3.49 (2.66 to 4.77)	1.13	1.58 (1.11 to 2.31)	3.95	5.04 (4.00 to 6.54)	●
Hartlepool and Stockton-on-Tees	3,395	5.60	4.54 (3.56 to 6.33)	2.37	1.85 (1.29 to 2.80)	7.95	6.45 (5.14 to 8.37)	●
Hastings and Rother	1,793	*	3.83 (2.83 to 5.13)	*	1.59 (1.10 to 2.39)	2.79	5.40 (4.17 to 7.08)	●
Havering	3,166	*	4.16 (3.18 to 5.68)	*	1.53 (1.03 to 2.40)	5.05	5.65 (4.55 to 7.13)	●
Herefordshire	1,737	5.76	4.46 (3.34 to 5.99)	1.74	1.75 (1.18 to 2.68)	7.48	6.24 (4.96 to 8.10)	●
Herts Valleys	7,607	2.37	3.39 (2.63 to 4.52)	1.45	1.66 (1.23 to 2.37)	3.81	5.04 (4.06 to 6.39)	●
Heywood, Middleton and Rochdale	2,854	5.26	4.26 (3.29 to 5.67)	1.41	1.63 (1.12 to 2.49)	6.66	5.88 (4.77 to 7.43)	●
High Weald Lewes Havens	1,493	*	4.07 (3.13 to 5.54)	*	1.70 (1.14 to 2.58)	4.69	5.79 (4.55 to 7.43)	●
Hillingdon	4,454	*	3.96 (3.16 to 5.18)	*	1.38 (0.93 to 2.12)	4.94	5.27 (4.27 to 6.74)	●
Horsham and Mid Sussex	2,332	5.15	4.45 (3.38 to 6.16)	2.16	1.82 (1.27 to 2.90)	7.29	6.33 (4.97 to 8.41)	●
Hounslow	4,254	3.06	3.53 (2.63 to 4.65)	1.89	1.73 (1.26 to 2.53)	4.94	5.26 (4.23 to 6.61)	●
Hull	3,565	7.57	5.13 (3.90 to 7.00)	2.54	1.88 (1.30 to 2.73)	10.10	7.07 (5.49 to 9.33)	●
Ipswich and East Suffolk	4,173	4.55	4.39 (3.42 to 5.76)	2.17	1.89 (1.33 to 2.90)	6.71	6.35 (5.16 to 8.11)	●

Organisation	Total births [§]	Rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Isle of Wight	1,317	*	3.82 (2.86 to 5.26)	*	1.72 (1.13 to 2.52)	3.04	5.56 (4.27 to 7.36)	●
Islington	2,891	3.11	3.68 (2.77 to 4.94)	1.39	1.58 (1.12 to 2.31)	4.50	5.25 (4.14 to 6.63)	●
Kernow	5,510	*	4.31 (3.40 to 5.73)	*	1.38 (0.92 to 2.11)	4.54	5.59 (4.54 to 7.09)	●
Kingston	2,255	4.43	4.12 (3.17 to 5.54)	1.78	1.75 (1.22 to 2.63)	6.21	5.90 (4.78 to 7.71)	●
Knowsley	1,904	*	4.60 (3.49 to 6.29)	*	1.63 (1.07 to 2.46)	7.88	6.21 (4.96 to 7.85)	●
Lambeth	4,560	2.63	3.40 (2.59 to 4.63)	2.20	1.79 (1.24 to 2.66)	4.82	5.19 (4.13 to 6.65)	●
Lancashire North	1,649	*	4.19 (3.17 to 5.72)	*	1.68 (1.19 to 2.63)	5.46	5.89 (4.65 to 7.59)	●
Leeds North	2,472	1.62	3.59 (2.69 to 4.83)	2.43	1.85 (1.34 to 2.94)	4.05	5.47 (4.34 to 7.04)	●
Leeds South and East	4,063	4.92	4.12 (3.27 to 5.43)	1.73	1.62 (1.15 to 2.37)	6.65	5.73 (4.61 to 7.11)	●
Leeds West	3,979	3.27	3.88 (3.01 to 5.18)	3.03	2.07 (1.48 to 3.20)	6.28	6.03 (4.84 to 7.55)	●
Leicester City	5,288	4.92	3.99 (3.11 to 5.27)	1.71	1.66 (1.20 to 2.39)	6.62	5.65 (4.64 to 7.02)	●
Lewisham	4,798	5.21	4.14 (3.28 to 5.30)	1.05	1.49 (1.03 to 2.25)	6.25	5.59 (4.57 to 6.85)	●
Lincolnshire East	2,296	3.05	3.96 (2.97 to 5.43)	1.75	1.76 (1.24 to 2.74)	4.79	5.75 (4.52 to 7.49)	●
Lincolnshire West	2,639	2.65	3.86 (2.89 to 5.21)	1.14	1.64 (1.07 to 2.50)	3.79	5.50 (4.33 to 6.99)	●
Liverpool	5,882	5.61	4.68 (3.73 to 6.26)	1.71	1.67 (1.23 to 2.48)	7.31	6.35 (5.28 to 7.94)	●
Luton	3,503	5.99	4.31 (3.39 to 5.73)	2.30	1.81 (1.31 to 2.71)	8.28	6.17 (5.06 to 7.66)	●
Mansfield and Ashfield	2,365	2.11	3.75 (2.81 to 5.14)	4.24	2.18 (1.46 to 3.62)	6.34	6.03 (4.82 to 7.76)	●
Medway	3,551	6.20	4.73 (3.60 to 6.39)	1.70	1.72 (1.23 to 2.57)	7.89	6.46 (5.18 to 8.45)	●
Merton	3,287	3.95	3.98 (3.09 to 5.28)	1.22	1.63 (1.13 to 2.40)	5.17	5.61 (4.50 to 7.07)	●
Mid Essex	4,154	4.57	4.42 (3.46 to 5.84)	1.69	1.76 (1.24 to 2.62)	6.26	6.21 (4.98 to 8.07)	●
Milton Keynes	3,726	2.95	3.69 (2.80 to 4.95)	2.42	1.89 (1.36 to 2.81)	5.37	5.61 (4.51 to 7.04)	●
Nene	7,742	3.36	3.85 (3.04 to 5.08)	2.72	2.18 (1.55 to 3.21)	6.07	6.09 (5.03 to 7.55)	●
Newark & Sherwood	1,246	*	3.75 (2.76 to 5.24)	*	1.72 (1.18 to 2.70)	2.41	5.49 (4.33 to 7.00)	●

Organisation	Total births [§]	Rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Newbury and District	1,314	3.81	4.10 (3.12 to 5.65)	2.29	1.79 (1.24 to 2.68)	6.09	5.94 (4.71 to 7.78)	●
Newcastle Gateshead	5,584	4.30	4.14 (3.19 to 5.33)	1.44	1.61 (1.17 to 2.30)	5.73	5.74 (4.67 to 7.17)	●
Newham	6,074	6.26	4.40 (3.57 to 5.56)	1.33	1.51 (1.04 to 2.20)	7.57	5.88 (4.83 to 7.31)	●
North & West Reading	1,211	*	4.50 (3.42 to 6.09)	*	1.58 (1.06 to 2.47)	7.43	6.05 (4.61 to 7.97)	●
North Derbyshire	2,564	3.90	4.15 (3.18 to 5.56)	3.13	2.01 (1.41 to 3.10)	7.02	6.25 (4.91 to 8.14)	●
North Durham	2,524	3.96	4.16 (3.13 to 5.60)	3.18	2.02 (1.42 to 3.13)	7.13	6.28 (4.89 to 8.34)	●
North East Essex	3,612	4.71	4.33 (3.49 to 5.86)	1.39	1.66 (1.17 to 2.49)	6.09	5.99 (4.81 to 7.54)	●
North East Hampshire and Farnham	2,597	4.24	4.18 (3.15 to 5.65)	1.93	1.79 (1.19 to 2.70)	6.16	6.02 (4.81 to 7.69)	●
North East Lincolnshire	1,952	4.61	4.20 (3.17 to 5.69)	1.54	1.70 (1.17 to 2.69)	6.15	5.93 (4.64 to 7.54)	●
North Hampshire	2,558	*	3.49 (2.62 to 4.89)	*	1.66 (1.16 to 2.56)	1.95	5.14 (3.96 to 6.68)	●
North Kirklees	2,661	7.14	4.61 (3.48 to 6.30)	3.03	1.96 (1.36 to 2.99)	10.15	6.66 (5.32 to 8.69)	●
North Lincolnshire	1,740	3.45	4.05 (3.08 to 5.55)	1.73	1.75 (1.17 to 2.80)	5.17	5.83 (4.52 to 7.48)	●
North Manchester	2,822	3.54	3.76 (2.91 to 5.08)	3.56	1.98 (1.40 to 3.12)	7.09	5.80 (4.73 to 7.41)	●
North Norfolk	1,340	*	4.12 (3.04 to 5.56)	*	1.73 (1.19 to 2.62)	5.22	5.88 (4.71 to 7.64)	●
North Somerset	2,205	*	4.28 (3.23 to 5.80)	*	1.62 (1.11 to 2.45)	5.44	5.90 (4.70 to 7.50)	●
North Staffordshire	2,094	4.30	4.23 (3.17 to 5.78)	2.40	1.85 (1.25 to 2.97)	6.69	6.15 (4.89 to 7.94)	●
North Tyneside	2,294	2.18	3.79 (2.83 to 5.04)	1.75	1.74 (1.19 to 2.66)	3.92	5.55 (4.34 to 7.45)	●
North West Surrey	4,506	3.77	4.04 (3.23 to 5.28)	1.11	1.60 (1.10 to 2.34)	4.88	5.63 (4.46 to 7.11)	●
Northern, Eastern and West Devon	9,067	4.52	4.57 (3.71 to 5.96)	1.55	1.71 (1.23 to 2.50)	6.07	6.29 (5.30 to 7.69)	●
Northumberland	2,768	6.14	4.68 (3.56 to 6.32)	2.18	1.82 (1.24 to 2.74)	8.31	6.55 (5.25 to 8.54)	●
Norwich	2,281	2.63	3.83 (2.90 to 5.13)	1.76	1.73 (1.17 to 2.63)	4.38	5.58 (4.51 to 7.36)	●
Nottingham City	4,262	7.04	4.80 (3.73 to 6.39)	2.84	1.93 (1.42 to 2.89)	9.85	6.80 (5.36 to 8.65)	●

Organisation	Total births [§]	Rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Nottingham North and East	1,627	*	3.64 (2.69 to 5.11)	*	1.75 (1.21 to 2.72)	2.46	5.41 (4.11 to 7.07)	●
Nottingham West	1,212	*	4.23 (3.15 to 5.94)	*	1.72 (1.17 to 2.69)	6.60	5.98 (4.80 to 7.81)	●
Oldham	3,291	3.95	3.95 (3.09 to 5.22)	3.66	2.09 (1.45 to 3.29)	7.60	6.13 (4.97 to 7.90)	●
Oxfordshire	7,638	3.40	3.92 (3.10 to 5.09)	1.31	1.62 (1.17 to 2.35)	4.71	5.53 (4.54 to 6.86)	●
Portsmouth	2,697	4.45	4.19 (3.25 to 5.65)	1.49	1.69 (1.16 to 2.63)	5.93	5.89 (4.64 to 7.53)	●
Redbridge	4,697	2.55	3.30 (2.47 to 4.43)	1.71	1.66 (1.19 to 2.43)	4.26	4.95 (3.93 to 6.25)	●
Redditch and Bromsgrove	2,014	*	3.61 (2.63 to 5.00)	*	1.85 (1.28 to 2.97)	3.48	5.50 (4.25 to 7.13)	●
Richmond	2,598	3.85	4.11 (3.10 to 5.70)	1.93	1.78 (1.25 to 2.76)	5.77	5.93 (4.73 to 7.55)	●
Rotherham	3,105	4.51	4.22 (3.29 to 5.66)	2.91	1.97 (1.33 to 2.96)	7.41	6.28 (4.88 to 8.06)	●
Rushcliffe	1,041	*	4.02 (3.01 to 5.57)	*	1.61 (1.09 to 2.45)	2.88	5.61 (4.34 to 7.09)	●
Salford	3,526	3.97	4.00 (3.09 to 5.32)	2.28	1.81 (1.27 to 2.84)	6.24	5.86 (4.75 to 7.48)	●
Sandwell and West Birmingham	7,571	6.34	4.67 (3.74 to 6.01)	3.32	2.21 (1.53 to 3.25)	9.64	6.96 (5.73 to 8.61)	●
Scarborough and Ryedale	1,132	*	4.07 (3.03 to 5.68)	*	1.74 (1.21 to 2.74)	5.30	5.85 (4.52 to 7.77)	●
Sheffield	6,612	5.44	4.59 (3.67 to 6.01)	1.98	1.75 (1.33 to 2.56)	7.41	6.35 (5.25 to 7.97)	●
Shropshire	2,848	4.21	4.26 (3.24 to 5.95)	2.47	1.91 (1.39 to 2.92)	6.67	6.25 (4.95 to 8.02)	●
Slough	2,605	5.37	4.10 (3.17 to 5.50)	1.16	1.61 (1.09 to 2.46)	6.53	5.70 (4.56 to 7.30)	●
Solihull	2,261	2.65	3.83 (2.88 to 5.17)	1.77	1.74 (1.21 to 2.64)	4.42	5.60 (4.42 to 7.23)	●
Somerset	5,620	4.63	4.53 (3.55 to 6.01)	0.89	1.52 (1.07 to 2.23)	5.52	6.00 (4.96 to 7.51)	●
South Cheshire	1,861	3.76	4.11 (3.07 to 5.72)	2.70	1.88 (1.29 to 3.02)	6.45	6.06 (4.75 to 7.67)	●
South Devon and Torbay	2,721	*	4.09 (3.10 to 5.51)	*	1.57 (1.07 to 2.47)	4.41	5.63 (4.47 to 7.31)	●
South East Staffordshire and Seisdon	2,185	2.75	3.92 (3.02 to 5.36)	1.38	1.69 (1.18 to 2.58)	4.12	5.63 (4.46 to 7.22)	●
South Eastern Hampshire	2,105	4.28	4.19 (3.19 to 5.72)	1.43	1.69 (1.14 to 2.60)	5.70	5.90 (4.64 to 7.51)	●
South Gloucestershire	3,155	4.75	4.40 (3.36 to 5.99)	1.27	1.67 (1.14 to 2.51)	6.02	6.07 (4.88 to 7.89)	●

Organisation	Total births [§]	Rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
South Kent Coast	2,155	3.71	4.06 (3.10 to 5.46)	1.86	1.75 (1.19 to 2.59)	5.57	5.84 (4.66 to 7.61)	●
South Lincolnshire	1,558	4.49	4.24 (3.22 to 5.72)	1.93	1.77 (1.23 to 2.71)	6.42	6.05 (4.67 to 7.79)	●
South Manchester	2,267	5.29	4.30 (3.37 to 5.93)	1.33	1.65 (1.13 to 2.50)	6.62	5.95 (4.75 to 7.76)	●
South Norfolk	2,565	2.34	3.84 (2.89 to 5.17)	1.56	1.74 (1.22 to 2.69)	3.90	5.60 (4.26 to 7.20)	●
South Reading	1,901	5.79	4.27 (3.27 to 5.69)	1.59	1.71 (1.15 to 2.64)	7.36	6.00 (4.70 to 7.81)	●
South Sefton	1,777	1.69	3.76 (2.84 to 5.09)	2.25	1.80 (1.23 to 2.67)	3.94	5.59 (4.38 to 7.31)	●
South Tees	3,436	2.91	3.74 (2.95 to 4.98)	2.34	1.81 (1.28 to 2.67)	5.24	5.60 (4.50 to 7.07)	●
South Tyneside	1,598	*	4.05 (3.06 to 5.43)	*	1.66 (1.15 to 2.59)	5.01	5.72 (4.56 to 7.51)	●
South Warwickshire	2,554	5.48	4.50 (3.39 to 6.19)	2.76	1.92 (1.33 to 2.97)	8.22	6.51 (5.14 to 8.55)	●
South West Lincolnshire	1,290	*	4.64 (3.44 to 6.43)	*	1.73 (1.17 to 2.75)	9.30	6.39 (5.11 to 8.60)	●
South Worcestershire	2,842	3.87	4.13 (3.17 to 5.51)	2.12	1.82 (1.31 to 2.70)	5.98	6.00 (4.79 to 7.72)	●
Southampton	3,326	*	4.37 (3.38 to 5.87)	*	1.50 (1.00 to 2.33)	5.71	5.82 (4.71 to 7.42)	●
Southend	2,218	*	3.76 (2.78 to 5.03)	*	1.54 (1.02 to 2.34)	2.71	5.27 (3.98 to 6.82)	●
Southern Derbyshire	6,203	3.06	3.70 (2.94 to 4.82)	3.40	2.33 (1.61 to 3.45)	6.45	6.11 (5.03 to 7.56)	●
Southport and Formby	1,014	*	4.44 (3.23 to 6.19)	*	1.68 (1.12 to 2.58)	7.89	6.13 (4.77 to 8.07)	●
Southwark	4,698	4.26	3.80 (2.94 to 5.00)	1.71	1.65 (1.19 to 2.39)	5.96	5.45 (4.38 to 6.90)	●
St Helens	1,979	4.04	4.12 (3.11 to 5.50)	2.03	1.77 (1.25 to 2.71)	6.06	5.92 (4.72 to 7.71)	●
Stafford and Surrounds	1,354	*	3.91 (2.95 to 5.34)	*	1.64 (1.08 to 2.52)	2.95	5.56 (4.33 to 7.13)	●
Stockport	3,394	3.83	4.10 (3.15 to 5.35)	0.89	1.57 (1.05 to 2.35)	4.71	5.65 (4.51 to 7.12)	●
Stoke on Trent	3,701	4.05	4.04 (3.10 to 5.39)	2.71	1.94 (1.38 to 2.99)	6.75	6.04 (4.84 to 7.69)	●
Sunderland	2,896	3.45	3.97 (3.05 to 5.34)	3.12	2.01 (1.37 to 3.13)	6.56	6.07 (4.92 to 7.80)	●
Surrey Downs	3,115	*	3.97 (3.08 to 5.32)	*	1.42 (0.94 to 2.23)	3.21	5.32 (4.15 to 6.90)	●
Surrey Heath	1,055	6.64	4.41 (3.28 to 6.16)	3.82	1.91 (1.27 to 2.95)	10.43	6.42 (4.99 to 8.72)	●

Organisation	Total births [§]	Rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Sutton	2,764	*	4.13 (3.13 to 5.69)	*	1.56 (1.04 to 2.44)	5.07	5.67 (4.59 to 7.05)	●
Swale	1,466	*	3.93 (3.00 to 5.53)	*	1.62 (1.12 to 2.49)	3.41	5.55 (4.49 to 7.11)	●
Swindon	3,020	*	3.62 (2.71 to 4.85)	*	1.54 (1.05 to 2.37)	2.65	5.14 (3.95 to 6.75)	●
Tameside and Glossop	3,337	5.69	4.57 (3.53 to 6.31)	0.90	1.57 (1.07 to 2.39)	6.59	6.10 (4.86 to 7.67)	●
Telford and Wrekin	2,045	2.93	3.88 (2.97 to 5.19)	2.45	1.83 (1.26 to 2.87)	5.38	5.76 (4.59 to 7.49)	●
Thanet	1,593	5.65	4.34 (3.21 to 6.02)	2.53	1.81 (1.22 to 2.91)	8.16	6.20 (4.88 to 8.12)	●
Thurrock	2,369	5.49	4.37 (3.28 to 5.98)	2.12	1.79 (1.22 to 2.75)	7.60	6.21 (4.86 to 7.91)	●
Tower Hamlets	4,651	5.81	4.25 (3.32 to 5.57)	1.73	1.53 (1.10 to 2.23)	7.53	5.73 (4.79 to 7.04)	●
Trafford	2,712	4.06	4.11 (3.15 to 5.51)	1.11	1.63 (1.15 to 2.41)	5.16	5.73 (4.42 to 7.40)	●
Vale Royal	1,106	2.71	4.00 (2.98 to 5.51)	5.44	2.07 (1.32 to 3.42)	8.14	6.18 (4.90 to 8.17)	●
Vale of York	3,482	4.02	4.22 (3.28 to 5.69)	2.02	1.83 (1.31 to 2.88)	6.03	6.10 (4.93 to 7.73)	●
Wakefield	3,996	5.01	4.45 (3.51 to 5.91)	1.76	1.75 (1.24 to 2.62)	6.76	6.23 (4.99 to 7.97)	●
Walsall	3,760	3.46	3.81 (2.98 to 5.08)	5.34	2.63 (1.73 to 4.53)	8.78	6.54 (5.31 to 8.38)	●
Waltham Forest	4,642	4.52	3.96 (3.11 to 5.07)	1.73	1.68 (1.19 to 2.52)	6.25	5.64 (4.63 to 7.09)	●
Wandsworth	5,122	2.54	3.52 (2.66 to 4.72)	0.98	1.50 (1.02 to 2.17)	3.51	4.99 (3.91 to 6.44)	●
Warrington	2,348	1.28	3.62 (2.72 to 4.88)	1.71	1.74 (1.21 to 2.56)	2.98	5.38 (4.14 to 7.11)	●
Warwickshire North	2,099	1.43	3.67 (2.74 to 5.01)	2.39	1.84 (1.29 to 2.79)	3.81	5.55 (4.39 to 7.12)	●
West Cheshire	2,434	1.64	3.67 (2.80 to 4.97)	2.47	1.87 (1.31 to 2.86)	4.11	5.59 (4.40 to 7.10)	●
West Essex	3,775	3.44	4.01 (3.21 to 5.34)	1.86	1.79 (1.26 to 2.68)	5.30	5.84 (4.68 to 7.44)	●
West Hampshire	5,679	3.52	4.09 (3.19 to 5.38)	0.88	1.53 (1.07 to 2.23)	4.40	5.58 (4.45 to 6.96)	●
West Kent	5,403	*	3.97 (3.07 to 5.18)	*	1.38 (0.91 to 2.06)	3.70	5.26 (4.22 to 6.71)	●
West Lancashire	1,011	*	3.93 (2.91 to 5.39)	*	1.61 (1.06 to 2.50)	*	5.53 (4.33 to 7.34)	●
West Leicestershire	3,879	4.38	4.31 (3.31 to 5.87)	2.07	1.86 (1.32 to 2.69)	6.44	6.22 (5.00 to 7.95)	●

Organisation	Total births [§]	Rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
West London	2,653	*	4.34 (3.34 to 5.96)	*	1.51 (1.04 to 2.29)	6.41	5.80 (4.72 to 7.45)	●
West Norfolk	1,868	3.21	4.02 (3.03 to 5.61)	2.15	1.80 (1.27 to 2.83)	5.35	5.87 (4.65 to 7.70)	●
West Suffolk	2,636	4.55	4.32 (3.20 to 5.88)	1.14	1.65 (1.13 to 2.52)	5.69	5.97 (4.83 to 7.72)	●
Wigan Borough	3,672	4.90	4.44 (3.45 to 5.99)	1.92	1.80 (1.30 to 2.68)	6.81	6.28 (5.06 to 7.99)	●
Wiltshire	5,312	3.01	3.84 (3.04 to 5.03)	1.51	1.70 (1.24 to 2.55)	4.52	5.55 (4.40 to 7.00)	●
Windsor, Ascot and Maidenhead	1,640	4.88	4.22 (3.20 to 5.87)	1.84	1.75 (1.21 to 2.75)	6.71	6.01 (4.80 to 7.93)	●
Wirral	3,553	4.22	4.20 (3.22 to 5.64)	0.85	1.55 (1.03 to 2.32)	5.07	5.72 (4.63 to 7.26)	●
Wokingham	1,822	*	4.67 (3.49 to 6.52)	*	1.66 (1.13 to 2.55)	8.23	6.32 (4.93 to 8.05)	●
Wolverhampton	3,506	7.13	4.75 (3.73 to 6.39)	2.30	1.80 (1.35 to 2.74)	9.41	6.59 (5.33 to 8.43)	●
Wyre Forest	1,052	*	4.61 (3.49 to 6.49)	*	1.74 (1.22 to 2.66)	10.46	6.38 (5.01 to 8.36)	●
SCOTLAND								
Ayrshire & Arran	3,598	5.28	4.53 (3.44 to 6.27)	1.12	1.60 (1.13 to 2.35)	6.39	6.11 (4.84 to 7.67)	●
Borders	997	*	4.35 (3.33 to 6.10)	*	1.76 (1.18 to 2.81)	8.02	6.16 (4.73 to 8.09)	●
Dumfries & Galloway	1,272	*	3.93 (2.98 to 5.41)	*	1.72 (1.20 to 2.73)	3.93	5.69 (4.41 to 7.39)	●
Fife	3,893	4.37	4.31 (3.40 to 5.71)	1.29	1.65 (1.17 to 2.43)	5.65	5.95 (4.70 to 7.55)	●
Forth Valley	3,093	2.91	3.91 (2.95 to 5.30)	1.95	1.79 (1.30 to 2.72)	4.85	5.74 (4.62 to 7.53)	●
Grampian	6,339	4.26	4.39 (3.47 to 5.77)	2.85	2.22 (1.55 to 3.35)	7.10	6.72 (5.45 to 8.48)	●
Greater Glasgow & Clyde	12,764	2.90	3.54 (2.85 to 4.55)	1.89	1.82 (1.42 to 2.50)	4.78	5.38 (4.41 to 6.56)	●
Highland	3,015	*	3.95 (3.04 to 5.34)	*	1.49 (0.97 to 2.20)	3.32	5.39 (4.26 to 7.02)	●
Lanarkshire	7,096	4.37	4.47 (3.49 to 5.68)	1.98	1.89 (1.38 to 2.78)	6.34	6.42 (5.30 to 7.99)	●
Lothian	9,636	3.42	Δ	1.77	Δ	5.19	Δ	○
Orkney	180	*	4.13 (3.09 to 5.69)	*	1.70 (1.11 to 2.69)	*	5.86 (4.47 to 7.82)	●
Shetland	264	*	4.10 (3.00 to 5.72)	*	1.69 (1.12 to 2.67)	*	5.82 (4.54 to 7.76)	●
Tayside	4,192	1.67	3.48 (2.57 to 4.72)	2.15	1.87 (1.32 to 2.85)	3.82	5.38 (4.31 to 6.83)	●
Western Isles	214	*	Δ	*	Δ	*	Δ	○

Organisation	Total births [§]	Rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
WALES								
Abertawe Bro Morgannwg University	5,530	6.15	5.05 (3.87 to 6.66)	1.82	1.78 (1.26 to 2.57)	7.96	6.85 (5.52 to 8.83)	●
Aneurin Bevan	6,590	3.79	4.05 (3.24 to 5.27)	1.52	1.66 (1.21 to 2.38)	5.31	5.72 (4.72 to 7.04)	●
Betsi Cadwaladr University	7,397	4.46	4.45 (3.56 to 5.77)	0.95	1.49 (1.02 to 2.18)	5.41	5.88 (4.83 to 7.27)	●
Cardiff and Vale University	5,913	5.41	4.61 (3.59 to 5.99)	2.04	1.79 (1.30 to 2.61)	7.44	6.44 (5.32 to 8.03)	●
Cwm Taf	3,509	6.27	4.80 (3.74 to 6.90)	2.58	1.93 (1.40 to 2.99)	8.83	6.81 (5.49 to 8.93)	●
Hywel Dda	3,658	2.19	3.68 (2.77 to 5.15)	1.92	1.80 (1.28 to 2.67)	4.10	5.51 (4.42 to 7.00)	●
Powys Teaching	1,154	*	4.19 (3.03 to 5.82)	*	1.67 (1.11 to 2.59)	5.20	5.87 (4.49 to 7.52)	●
NORTHERN IRELAND[°]								
Belfast [°]	4,728	4.44	4.24 (3.33 to 5.59)	3.19	2.13 (1.49 to 3.41)	7.61	6.49 (5.19 to 8.30)	●
Northern [°]	5,873	3.06	3.89 (3.00 to 5.23)	2.39	2.02 (1.46 to 3.00)	5.45	5.97 (4.88 to 7.57)	●
South Eastern [°]	4,327	3.00	3.89 (2.99 to 5.15)	2.32	1.92 (1.37 to 2.96)	5.32	5.87 (4.78 to 7.37)	●
Southern [°]	5,519	4.35	4.39 (3.44 to 5.72)	2.73	2.12 (1.46 to 3.20)	7.07	6.61 (5.40 to 8.39)	●
Western [°]	4,042	3.71	4.06 (3.18 to 5.36)	2.98	2.07 (1.46 to 3.21)	6.68	6.23 (5.08 to 7.90)	●
CROWN DEPENDENCIES								
Bailiwick of Guernsey	616	*	3.97 (2.94 to 5.47)	*	1.72 (1.18 to 2.70)	*	5.72 (4.51 to 7.51)	●
Bailiwick of Jersey	812	*	3.87 (2.84 to 5.33)	*	1.76 (1.21 to 2.81)	3.69	5.67 (4.30 to 7.34)	●
Isle of Man	986	*	3.85 (2.77 to 5.34)	*	1.61 (1.08 to 2.44)	*	5.44 (4.23 to 7.08)	●

[†] per 1,000 total births

[‡] per 1,000 live births

[§] excluding terminations of pregnancy and births <24⁺⁰ weeks gestational age

[°] different laws exist in Northern Ireland for the termination of pregnancy

^Δ stabilised & adjusted rate not calculated due to unavailability of some individual level data

* entry suppressed because of small number of deaths

[#] colours represent variation from UK average extended perinatal mortality rate

Data sources: MBRRACE-UK, NN4B, ONS, NRS, ISD, NIMATS, States of Guernsey, States of Jersey

3.3 Mortality rates for individual Trusts and Health Boards

This section of the report summarises the stillbirth, neonatal death, and extended perinatal mortality rates for 2014 for individual Trusts and Health Boards. Babies have been allocated based on the Trust or Health Board in which they were born irrespective of where they died.

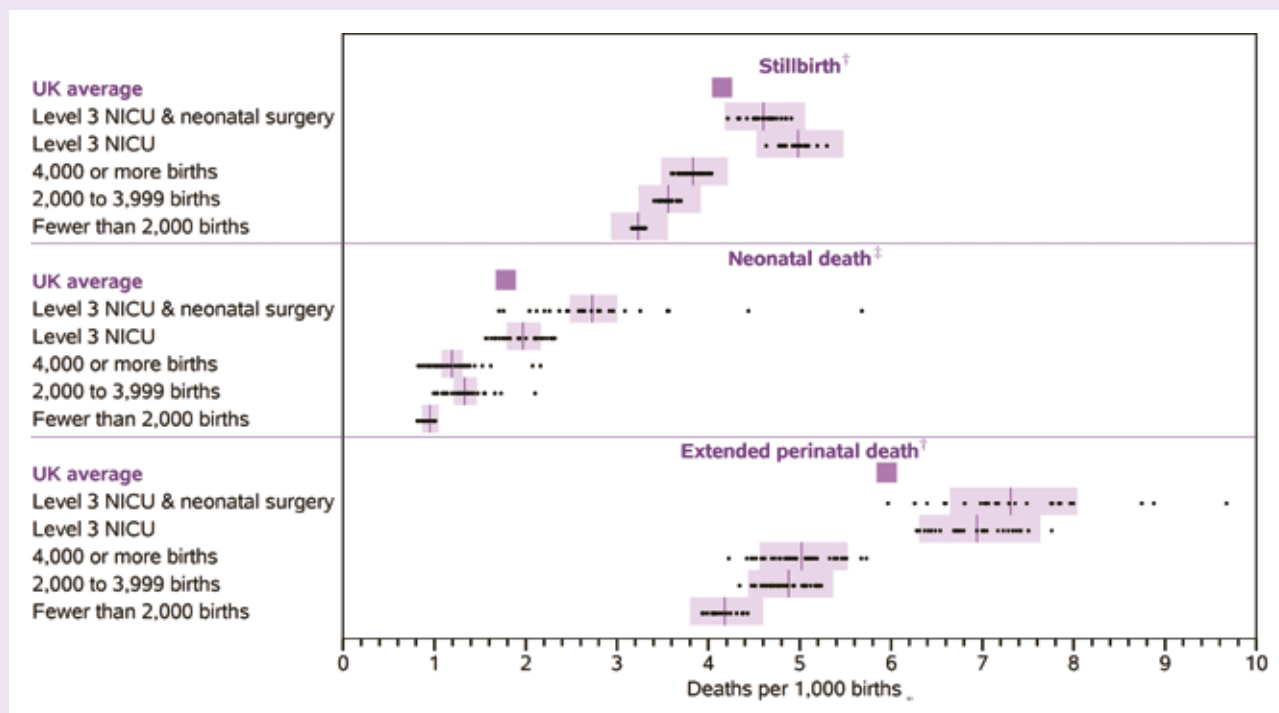
Three mortality outcomes are reported for each organisation: stillbirth, neonatal death, and extended perinatal death. These mortality rates are presented in two different ways: as a 'crude' mortality rate and as a 'stabilised & adjusted' mortality rate (see Section 2.7).

In addition, to account for the wide variation in case-mix, Trusts and Health Boards have been classified hierarchically into five mutually exclusive comparator groups, based on their level of service provision:

1. Level 3 NICU and Neonatal Surgery.
2. Level 3 NICU.
3. 4,000 or more births per annum at 22 weeks or later.
4. 2,000-3,999 births per annum at 22 weeks or later.
5. Under 2,000 births per annum at 22 weeks or later.

Figure 9 demonstrates the extent to which this classification reflects the risk profiles of the different types of unit. The average mortality rate for each comparator group is shown as a vertical purple line, with a shaded box representing $\pm 10\%$ from the average.

Figure 9: Stabilised & adjusted mortality rates by NHS Trust (England), Health Board (Scotland and Wales), Health and Social Care Trust (Northern Ireland), and Crown Dependency based on place of birth: United Kingdom and Crown Dependencies, for births in 2014



[†] per 1,000 total births

[‡] per 1,000 live births

[§] excluding terminations of pregnancy and births <24⁺⁰ weeks gestational age

Data sources: MBRRACE-UK, NN4B, ONS, NRS, ISD, NIMATS, States of Guernsey, States of Jersey

Note: different laws exist in Northern Ireland for the termination of pregnancy

The crude and the stabilised & adjusted stillbirth, neonatal mortality and extended perinatal mortality rates for UK Trusts and Health Boards are presented in Figure 10, 11, 12, 13, 14 and 15 and Tables 6, 7, 8, 9 and 10. Each of the tables contains data for a single comparator group. The average mortality rate used in each of the five tables is that of the relevant comparator group; for example, the reported mortality rates for Trusts and Health Boards with neonatal surgical provision and Level 3 NICUs have been compared to the average mortality rate derived from all of the Trusts and Health Boards providing this level of care. It is important to note that this is in contrast to the stabilised & adjusted data presented in the rest of the report relating to commissioning organisations, local authorities and Neonatal Networks, where the comparison is in relation to the UK average for 2014.



Figure 10: Crude stillbirth mortality rates by NHS Trust (England), Health Board (Scotland and Wales), Health and Social Care Trust (Northern Ireland), and Crown Dependency based on place of birth: United Kingdom and Crown Dependencies, for births in 2014

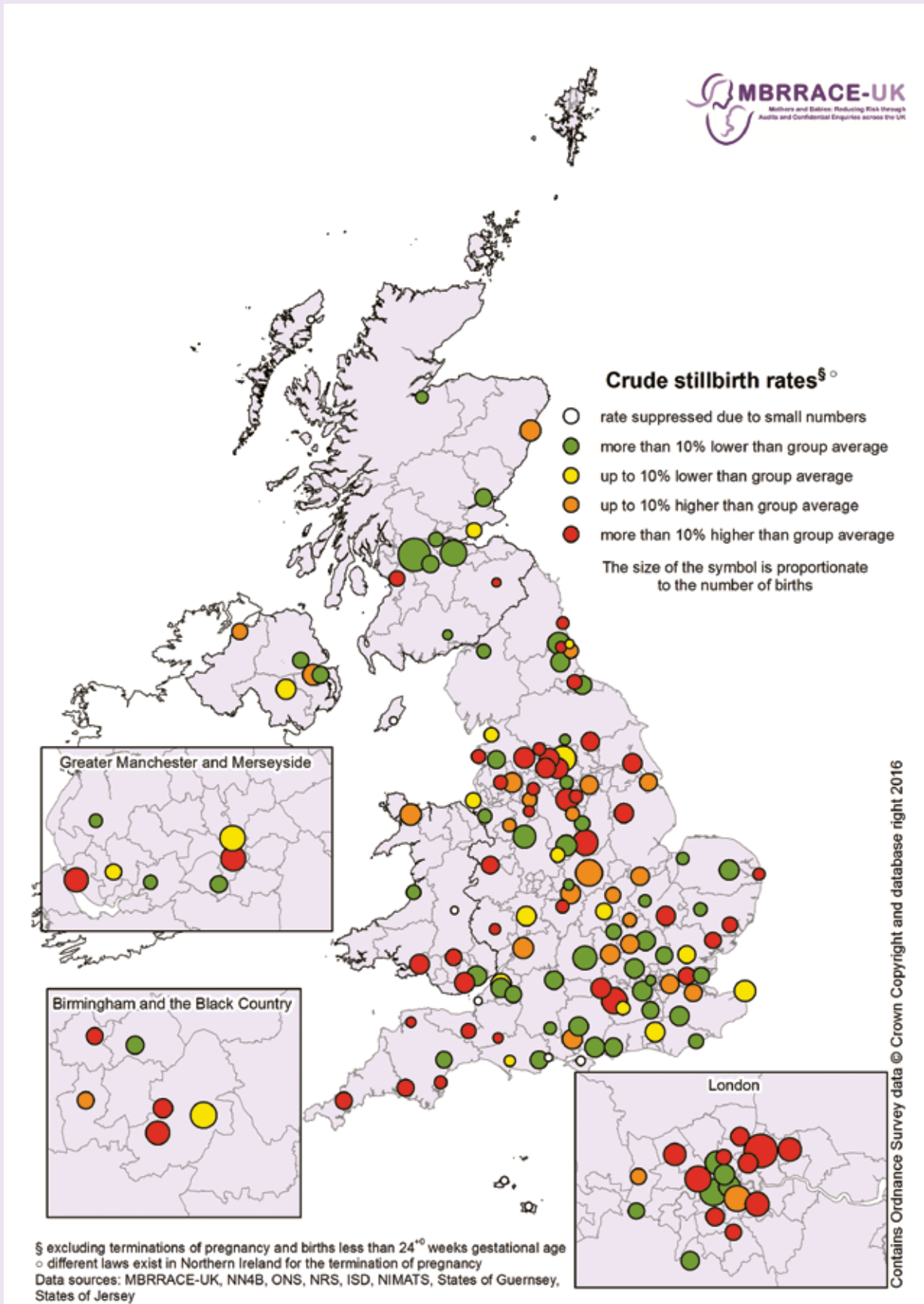


Figure 11: Stabilised & adjusted stillbirth mortality rates by NHS Trust (England), Health Board (Scotland and Wales), Health and Social Care Trust (Northern Ireland), and Crown Dependency based on place of birth: United Kingdom and Crown Dependencies, for births in 2014

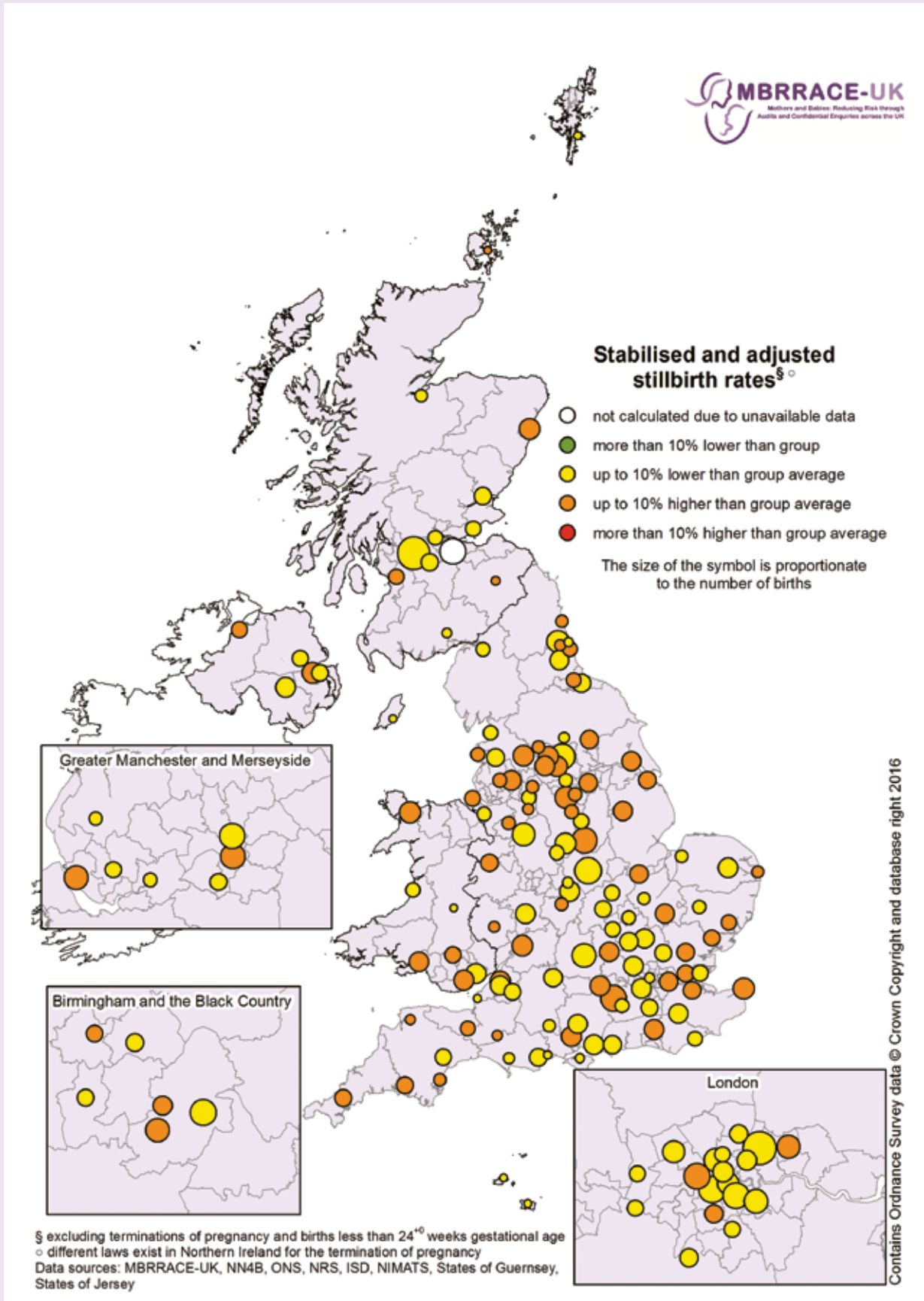


Figure 12: Crude neonatal mortality rates by NHS Trust (England), Health Board (Scotland and Wales), Health and Social Care Trust (Northern Ireland), and Crown Dependency based on place of birth: United Kingdom and Crown Dependencies, for births in 2014

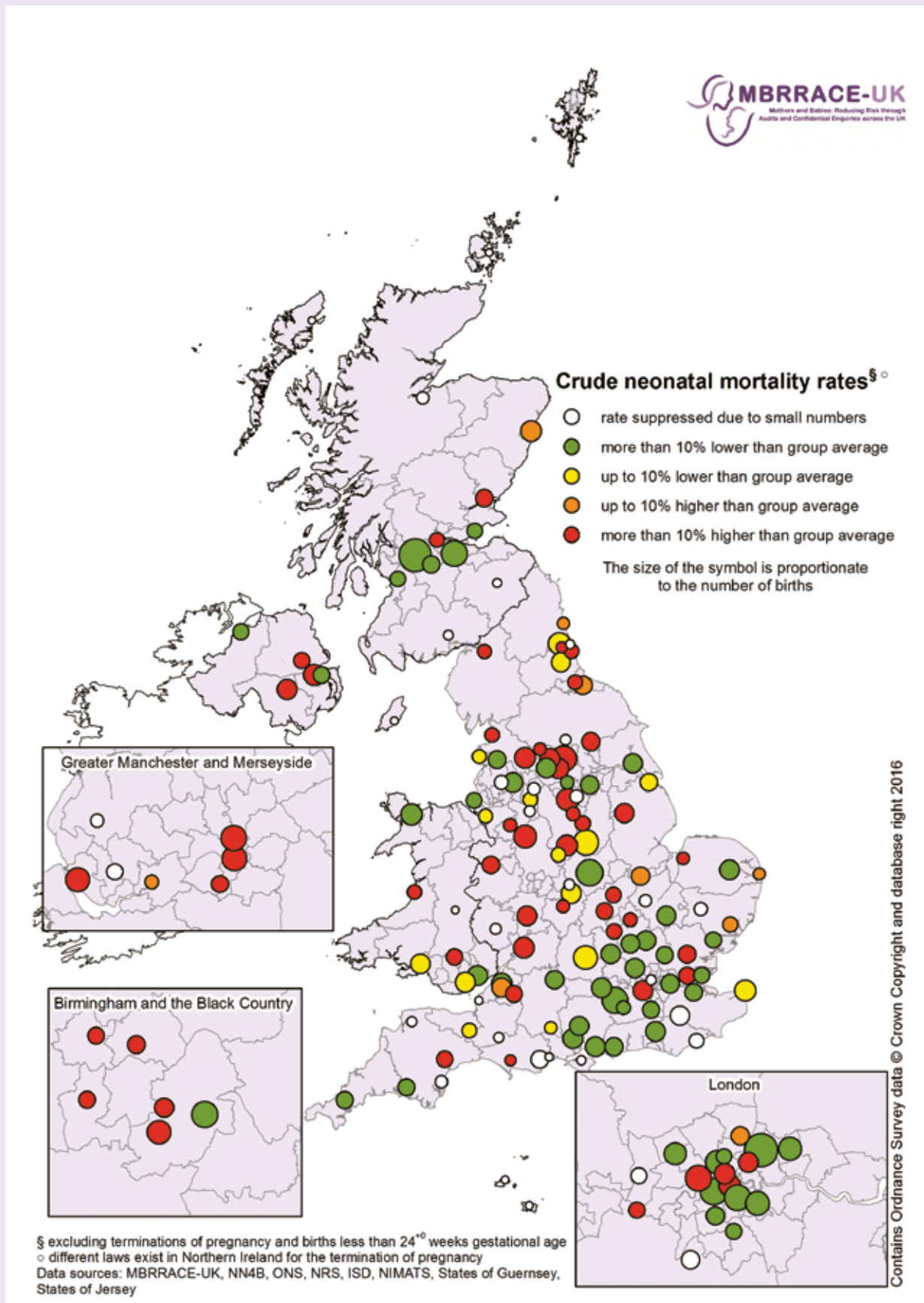


Figure 13: Stabilised & adjusted neonatal mortality rates by NHS Trust (England), Health Board (Scotland and Wales), Health and Social Care Trust (Northern Ireland), and Crown Dependency based on place of birth: United Kingdom and Crown Dependencies, for births in 2014

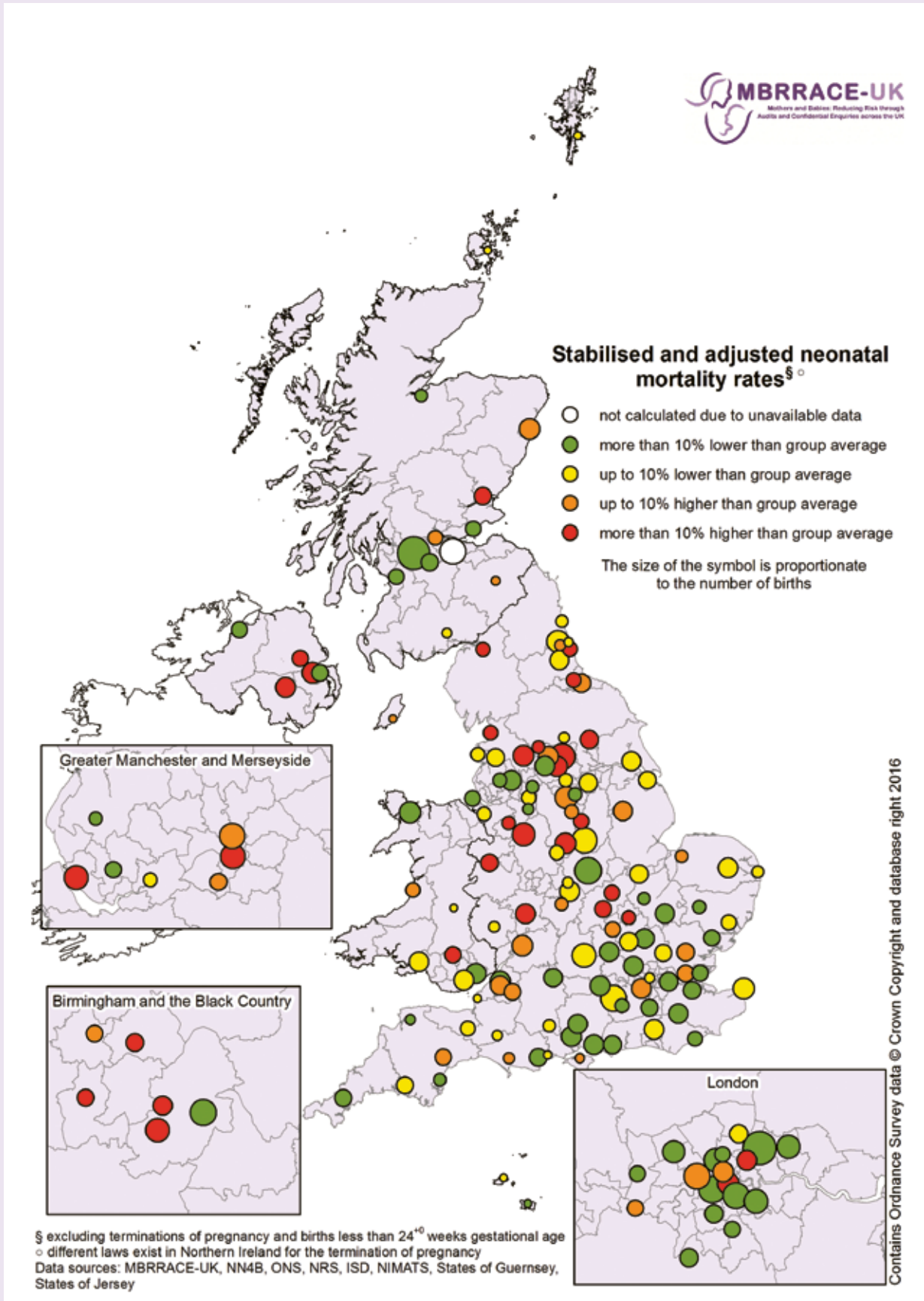


Figure 14: Crude extended perinatal mortality rates by NHS Trust (England), Health Board (Scotland and Wales), Health and Social Care Trust (Northern Ireland), and Crown Dependency based on place of birth: United Kingdom and Crown Dependencies, for births in 2014

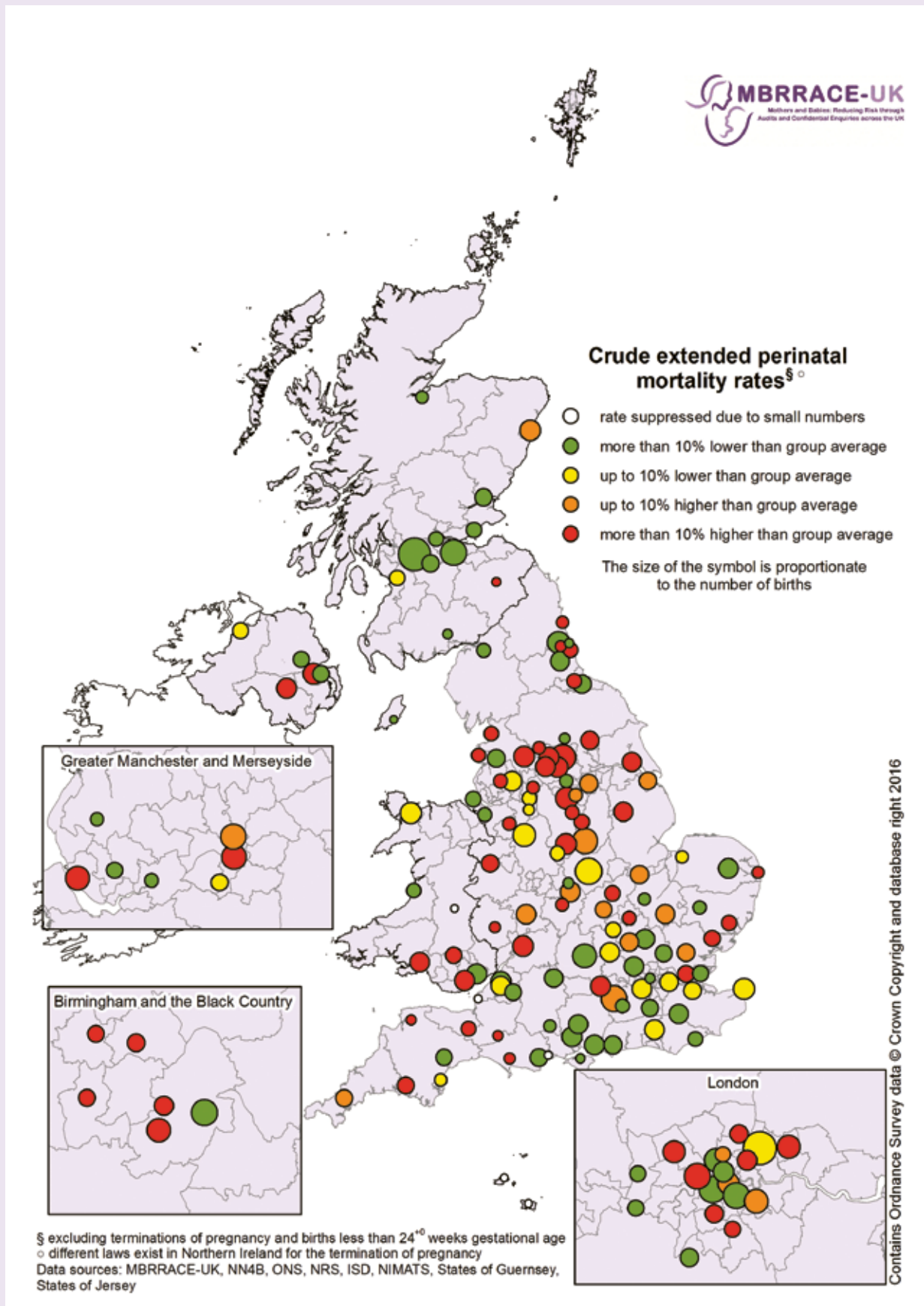


Figure 15: Stabilised & adjusted extended perinatal mortality rates by NHS Trust (England), Health Board (Scotland and Wales), Health and Social Care Trust (Northern Ireland), and Crown Dependency based on place of birth: United Kingdom and Crown Dependencies, for births in 2014

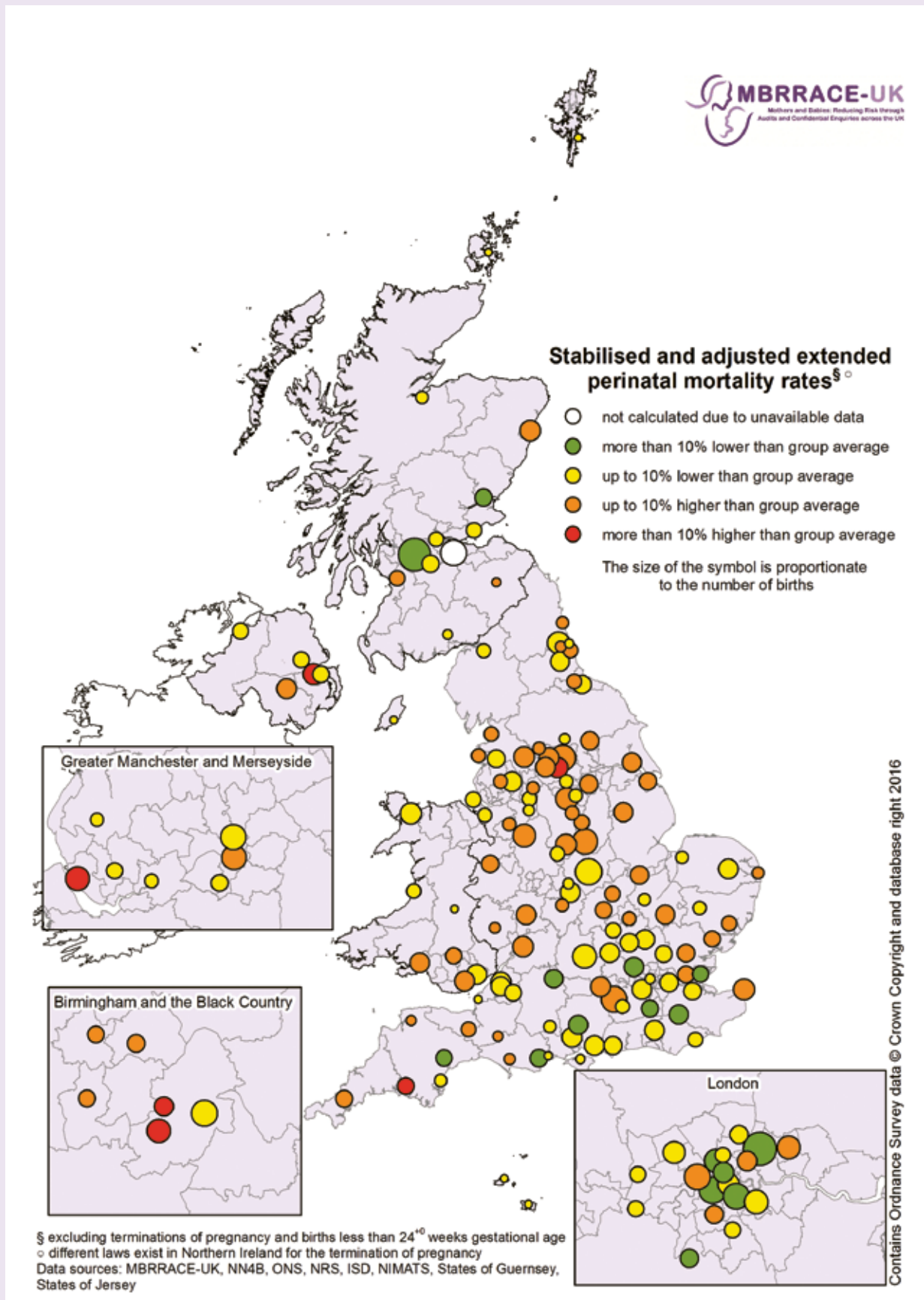


Table 6: Crude and stabilised & adjusted stillbirth, neonatal, and extended perinatal mortality rates by NHS Trust (England), Health Board (Scotland and Wales), Health and Social Care Trust (Northern Ireland), and Crown Dependency based on place of birth: United Kingdom and Crown Dependencies, for births in 2014. FOR TRUSTS AND HEALTH BOARDS WITH NEONATAL SURGICAL PROVISION AND A LEVEL 3 NICU

Organisation	Total births [§]	Rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Average for comparator group			4.60		2.73		7.31	
Barts Health NHS Trust	16,417	5.30	4.49 (3.86 to 5.35)	1.65	1.71 (1.24 to 2.52)	6.94	6.26 (5.19 to 7.56)	●
Belfast Health and Social Care Trust ^o	6,269	4.94	4.69 (3.96 to 5.58)	6.89	5.68 (3.99 to 9.04)	11.80	9.67 (7.73 to 12.40)	●
Birmingham Women's NHS Foundation Trust	8,180	5.75	4.75 (4.02 to 5.68)	5.53	4.44 (3.19 to 6.69)	11.25	8.88 (7.18 to 10.84)	●
Brighton and Sussex University Hospitals NHS Trust	5,816	4.30	4.61 (3.93 to 5.47)	2.42	2.58 (1.79 to 4.04)	6.71	7.29 (5.91 to 8.83)	●
Cambridge University Hospitals NHS Foundation Trust	5,656	5.83	4.85 (3.97 to 5.93)	1.78	2.26 (1.50 to 3.48)	7.60	7.76 (6.29 to 9.67)	●
Cardiff and Vale University Health Board	5,839	6.17	4.85 (4.15 to 6.06)	2.58	2.62 (1.78 to 4.19)	8.73	8.00 (6.41 to 9.82)	●
Central Manchester University Hospitals NHS Foundation Trust	8,907	5.39	4.64 (3.99 to 5.51)	3.50	3.09 (2.24 to 4.63)	8.87	7.75 (6.48 to 9.66)	●
Chelsea and Westminster Hospital NHS Foundation Trust	10,548	3.70	4.33 (3.43 to 5.28)	1.33	1.76 (1.20 to 2.71)	5.02	5.97 (4.78 to 7.38)	●
Guy's and St Thomas' NHS Foundation Trust	6,801	3.68	4.32 (3.45 to 5.24)	3.84	3.25 (2.27 to 5.04)	7.50	6.98 (5.63 to 8.55)	●
Hull and East Yorkshire Hospitals NHS Trust	5,450	5.69	4.80 (3.99 to 5.86)	2.40	2.58 (1.70 to 4.00)	8.07	7.85 (6.26 to 9.49)	●
King's College Hospital NHS Foundation Trust	9,831	4.68	4.51 (3.79 to 5.24)	1.74	2.05 (1.41 to 3.10)	6.41	6.60 (5.49 to 8.06)	●

Organisation	Total births [§]	Rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Liverpool Women's NHS Foundation Trust	8,410	5.95	4.90 (3.99 to 6.12)	3.95	3.55 (2.48 to 5.31)	9.87	8.75 (7.10 to 10.94)	●
NHS Grampian	6,395	4.69	4.71 (3.99 to 5.62)	2.83	2.92 (1.99 to 4.64)	7.51	7.84 (6.27 to 9.71)	●
NHS Greater Glasgow and Clyde	15,702	3.38	4.34 (3.53 to 5.21)	2.24	2.45 (1.82 to 3.50)	5.60	6.58 (5.42 to 7.85)	●
NHS Lothian	9,744	3.59	Δ	1.75	Δ	5.34	Δ	○
Norfolk and Norwich University Hospitals NHS Foundation Trust	5,798	2.93	4.42 (3.62 to 5.40)	2.42	2.64 (1.85 to 4.17)	5.35	6.81 (5.46 to 8.45)	●
Nottingham University Hospitals NHS Trust	9,657	5.07	4.68 (4.01 to 5.54)	2.60	2.62 (1.89 to 3.97)	7.66	7.49 (6.14 to 9.05)	●
Oxford University Hospitals NHS Trust	8,531	3.87	4.53 (3.80 to 5.34)	2.59	2.72 (1.91 to 4.12)	6.45	7.18 (5.84 to 8.81)	●
Sheffield Teaching Hospitals NHS Foundation Trust	7,202	5.69	4.75 (4.04 to 5.72)	3.21	2.96 (2.08 to 4.50)	8.89	7.97 (6.59 to 9.83)	●
St George's University Hospitals NHS Foundation Trust	5,083	5.71	4.67 (4.00 to 5.52)	2.37	2.46 (1.66 to 3.88)	8.07	7.36 (5.92 to 8.97)	●
The Leeds Teaching Hospitals NHS Trust	9,870	4.26	4.50 (3.83 to 5.24)	3.97	3.57 (2.54 to 5.15)	8.21	7.77 (6.38 to 9.32)	●
The Newcastle upon Tyne Hospitals NHS Foundation Trust	7,567	3.96	4.52 (3.72 to 5.32)	2.52	2.59 (1.81 to 3.97)	6.48	7.07 (5.83 to 8.66)	●
University College London Hospitals NHS Foundation Trust	6,548	2.60	4.21 (3.24 to 5.28)	3.22	2.79 (1.94 to 4.22)	5.80	6.40 (5.20 to 7.99)	●
University Hospital Southampton NHS Foundation Trust	5,843	4.79	4.68 (3.96 to 5.46)	1.55	2.12 (1.41 to 3.38)	6.33	7.15 (5.77 to 8.78)	●
University Hospitals of Bristol NHS Foundation Trust	5,330	4.13	4.55 (3.82 to 5.32)	2.83	2.82 (1.83 to 4.43)	6.94	7.29 (5.87 to 8.90)	●

Organisation	Total births [§]	Rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [‡]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
University Hospitals of Leicester NHS Trust	10,479	4.87	4.59 (3.89 to 5.42)	2.21	2.37 (1.71 to 3.53)	7.06	7.04 (5.81 to 8.50)	●
Wirral University Teaching Hospital NHS Foundation Trust	3,509	4.27	4.60 (3.87 to 5.48)	1.43	2.20 (1.39 to 3.64)	5.70	7.02 (5.64 to 8.84)	●

[†] per 1,000 total births

[‡] per 1,000 live births

[§] excluding terminations of pregnancy and births <24⁺⁰ weeks gestational age

[○] different laws exist in Northern Ireland for the termination of pregnancy

[△] stabilised & adjusted rate not calculated due to unavailability of some individual level data

[#] colours represent variation from comparator group average extended perinatal mortality rate

Data sources: MBRRACE-UK, NN4B, ONS, NRS, ISD, NIMATS, States of Guernsey, States of Jersey

Table 7: Crude and stabilised & adjusted stillbirth, neonatal, and extended perinatal mortality rates by NHS Trust (England), Health Board (Scotland and Wales), Health and Social Care Trust (Northern Ireland), and Crown Dependency based on place of birth: United Kingdom and Crown Dependencies, for births in 2014. FOR TRUSTS AND HEALTH BOARDS WITH A LEVEL 3 NICU

Organisation	Total births [§]	Mortality rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [‡]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Average for comparator group			4.98		1.97		6.94	
Abertawe Bro Morgannwg University Health Board	5,818	6.02	5.19 (4.29 to 6.48)	1.90	1.94 (1.33 to 3.17)	7.91	7.50 (5.97 to 9.45)	●
Aneurin Bevan Health Board	5,968	3.69	4.81 (4.03 to 5.61)	1.51	1.75 (1.17 to 2.84)	5.19	6.37 (5.16 to 7.82)	●
Ashford and St Peter's Hospitals NHS Foundation Trust	4,039	3.22	4.79 (3.95 to 5.62)	2.24	2.10 (1.41 to 3.53)	5.45	6.54 (5.21 to 8.28)	●
Bolton NHS Foundation Trust	5,826	5.32	5.01 (4.28 to 5.91)	1.21	1.57 (1.03 to 2.64)	6.52	6.71 (5.45 to 8.47)	●
Bradford Teaching Hospitals NHS Foundation Trust	5,879	6.63	5.08 (4.31 to 6.05)	2.57	2.11 (1.46 to 3.33)	9.19	7.33 (6.06 to 9.22)	●
City Hospitals Sunderland NHS Foundation Trust	3,082	5.19	5.00 (4.22 to 6.01)	2.94	2.29 (1.50 to 3.91)	8.11	7.28 (5.84 to 9.31)	●

Organisation	Total births [§]	Mortality rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
East Kent Hospitals University NHS Foundation Trust	7,011	4.85	5.01 (4.26 to 5.99)	1.86	1.93 (1.30 to 3.07)	6.70	7.02 (5.63 to 8.60)	●
East Lancashire Hospitals NHS Trust	6,518	5.52	5.01 (4.17 to 5.98)	2.47	2.19 (1.49 to 3.48)	7.98	7.23 (5.98 to 8.98)	●
Heart of England NHS Foundation Trust	9,982	4.71	4.81 (4.04 to 5.67)	1.51	1.62 (1.08 to 2.62)	6.21	6.31 (5.24 to 7.76)	●
Homerton University Hospital NHS Foundation Trust	5,846	5.99	4.96 (4.22 to 5.92)	2.93	2.30 (1.58 to 3.83)	8.89	7.17 (5.89 to 8.81)	●
Imperial College Healthcare NHS Trust	10,001	6.20	5.09 (4.38 to 5.98)	2.52	2.16 (1.50 to 3.45)	8.70	7.37 (6.11 to 9.11)	●
Lancashire Teaching Hospitals NHS Foundation Trust	4,533	3.75	4.85 (3.99 to 5.70)	1.55	1.79 (1.14 to 2.99)	5.29	6.49 (5.13 to 8.13)	●
Luton and Dunstable Hospital NHS Foundation Trust	5,185	5.40	4.94 (4.17 to 5.87)	1.75	1.82 (1.24 to 3.02)	7.14	6.76 (5.49 to 8.48)	●
Medway NHS Foundation Trust	4,747	5.48	5.06 (4.29 to 6.08)	1.27	1.66 (1.07 to 2.84)	6.74	6.94 (5.62 to 8.73)	●
NHS Ayrshire and Arran	3,574	5.60	5.07 (4.25 to 6.19)	1.13	1.66 (1.07 to 2.81)	6.72	7.00 (5.64 to 8.80)	●
NHS Fife	3,514	4.55	4.97 (4.22 to 5.94)	1.14	1.67 (1.00 to 2.95)	5.69	6.73 (5.33 to 8.43)	●
NHS Lanarkshire	4,802	4.37	4.97 (4.18 to 5.88)	1.25	1.71 (1.07 to 2.79)	5.62	6.76 (5.42 to 8.46)	●
NHS Tayside	4,539	1.76	4.63 (3.57 to 5.79)	2.65	2.32 (1.47 to 3.70)	4.41	6.28 (4.90 to 7.76)	●
North Bristol NHS Trust	6,261	4.79	5.00 (4.28 to 6.01)	1.12	1.57 (0.96 to 2.56)	5.91	6.69 (5.42 to 8.43)	●
North Tees and Hartlepool NHS Foundation Trust	3,111	5.79	5.05 (4.33 to 6.01)	2.91	2.27 (1.46 to 3.92)	8.68	7.42 (5.91 to 9.36)	●
Plymouth Hospitals NHS Trust	4,315	7.18	5.30 (4.37 to 6.74)	1.63	1.83 (1.19 to 3.06)	8.81	7.76 (6.06 to 9.79)	●
Portsmouth Hospitals NHS Trust	5,850	3.76	4.83 (3.99 to 5.75)	1.54	1.77 (1.15 to 2.84)	5.30	6.44 (5.04 to 8.01)	●
South Tees Hospitals NHS Foundation Trust	5,243	3.62	4.77 (3.83 to 5.72)	2.11	2.00 (1.33 to 3.25)	5.72	6.41 (5.27 to 8.06)	●

Organisation	Total births [§]	Mortality rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
The Pennine Acute Hospitals NHS Trust	9,617	4.68	4.81 (4.03 to 5.66)	2.40	2.13 (1.49 to 3.40)	7.07	6.73 (5.51 to 8.26)	●
The Royal Wolverhampton Hospitals NHS Trust	4,150	6.51	5.10 (4.35 to 6.11)	2.43	2.10 (1.38 to 3.54)	8.92	7.41 (5.96 to 9.18)	●
University Hospitals Coventry and Warwickshire NHS Trust	6,157	5.03	4.92 (4.13 to 5.87)	1.96	1.92 (1.29 to 3.10)	6.98	6.80 (5.63 to 8.53)	●
University Hospitals of North Midlands NHS Trust	7,642	4.45	4.92 (4.11 to 5.81)	2.37	2.23 (1.49 to 3.57)	6.80	7.05 (5.84 to 8.73)	●

[†] per 1,000 total births

[‡] per 1,000 live births

[§] excluding terminations of pregnancy and births <24⁺⁰ weeks gestational age

[○] different laws exist in Northern Ireland for the termination of pregnancy

[#] colours represent variation from comparator group average extended perinatal mortality rate

Data sources: MBRRACE-UK, NN4B, ONS, NRS, ISD, NIMATS, States of Guernsey, States of Jersey

Table 8: Crude and stabilised & adjusted stillbirth, neonatal, and extended perinatal mortality rates by NHS Trust (England), Health Board (Scotland and Wales), Health and Social Care Trust (Northern Ireland), and Crown Dependency based on place of birth: United Kingdom and Crown Dependencies, for births in 2014. FOR TRUSTS AND HEALTH BOARDS WITH 4,000 OR MORE BIRTHS $\geq 22^{+0}$ WEEKS GESTATIONAL AGE PER ANNUM

Organisation	Total births [§]	Mortality rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Average for comparator group			3.83		1.19		5.02	
Barking, Havering and Redbridge University Hospitals NHS Trust	7,793	5.13	3.91 (3.31 to 4.70)	1.03	1.06 (0.67 to 1.82)	6.16	5.12 (4.23 to 6.41)	●
Basildon and Thurrock University Hospitals NHS Foundation Trust	4,321	5.55	3.98 (3.33 to 4.92)	1.40	1.22 (0.76 to 2.13)	6.94	5.50 (4.38 to 6.96)	●
Betsi Cadwaladr University Health Board	6,944	4.03	3.89 (3.27 to 4.66)	0.58	0.94 (0.59 to 1.63)	4.61	4.95 (4.03 to 6.18)	●
Buckinghamshire Healthcare NHS Trust	5,386	4.08	3.84 (3.34 to 4.59)	0.56	0.96 (0.62 to 1.67)	4.64	4.88 (4.03 to 6.17)	●
Calderdale and Huddersfield NHS Foundation Trust	5,778	5.71	4.02 (3.33 to 5.09)	0.87	1.03 (0.65 to 1.82)	6.58	5.41 (4.47 to 6.79)	●
County Durham and Darlington NHS Foundation Trust	5,358	2.99	3.74 (3.16 to 4.42)	1.12	1.15 (0.74 to 1.94)	4.11	4.78 (3.88 to 6.15)	●
Cwm Taf Health Board	4,034	5.21	3.95 (3.29 to 4.81)	1.74	1.32 (0.88 to 2.27)	6.94	5.51 (4.44 to 7.26)	●
Dartford and Gravesham NHS Trust	5,016	4.19	3.83 (3.19 to 4.58)	0.80	1.03 (0.64 to 1.82)	4.98	4.87 (3.91 to 6.15)	●
Derby Teaching Hospitals NHS Foundation Trust	6,270	2.87	3.69 (2.98 to 4.35)	3.36	2.16 (1.33 to 3.69)	6.22	5.41 (4.40 to 6.88)	●
Doncaster and Bassetlaw Hospitals NHS Foundation Trust	5,104	4.11	3.86 (3.26 to 4.67)	0.98	1.10 (0.72 to 1.95)	5.09	5.06 (4.17 to 6.39)	●
East and North Hertfordshire NHS Trust	5,449	2.57	3.69 (3.07 to 4.40)	0.92	1.08 (0.71 to 1.86)	3.49	4.58 (3.70 to 5.81)	●

Organisation	Total births [§]	Mortality rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Epsom and St Helier University Hospitals NHS Trust	4,924	*	3.70 (3.04 to 4.36)	*	0.92 (0.58 to 1.63)	3.25	4.49 (3.59 to 5.75)	●
Frimley Health NHS Foundation Trust	9,804	4.39	3.89 (3.36 to 4.61)	1.02	1.09 (0.74 to 1.72)	5.41	5.10 (4.26 to 6.16)	●
Gloucestershire Hospitals NHS Foundation Trust	6,223	4.18	3.90 (3.32 to 4.64)	1.45	1.29 (0.83 to 2.21)	5.62	5.33 (4.35 to 6.72)	●
Great Western Hospitals NHS Foundation Trust	4,973	2.21	3.66 (2.97 to 4.36)	0.81	1.05 (0.65 to 1.79)	3.02	4.48 (3.53 to 5.68)	●
Hampshire Hospitals NHS Foundation Trust	5,578	2.33	3.67 (3.05 to 4.39)	0.72	1.01 (0.67 to 1.73)	3.05	4.48 (3.49 to 5.62)	●
Kingston Hospital NHS Trust	5,828	3.43	3.77 (3.18 to 4.45)	1.38	1.24 (0.82 to 2.10)	4.80	4.94 (4.04 to 6.08)	●
Lewisham and Greenwich NHS Trust	8,257	4.48	3.78 (3.17 to 4.49)	0.97	1.02 (0.67 to 1.72)	5.45	4.79 (3.94 to 5.87)	●
London North West Healthcare NHS Trust	7,392	5.14	3.83 (3.28 to 4.51)	0.41	0.82 (0.52 to 1.44)	5.55	4.73 (3.91 to 5.82)	●
Maidstone and Tunbridge Wells NHS Trust	5,590	*	3.74 (3.11 to 4.31)	*	0.84 (0.53 to 1.46)	3.04	4.47 (3.49 to 5.69)	●
Mid Essex Hospital Services NHS Trust	4,746	3.79	3.85 (3.22 to 4.58)	1.48	1.28 (0.82 to 2.20)	5.27	5.18 (4.22 to 6.49)	●
North Middlesex University Hospital NHS Trust	4,934	4.46	3.78 (3.23 to 4.40)	1.22	1.13 (0.72 to 1.84)	5.67	4.84 (3.96 to 6.05)	●
Northampton General Hospital NHS Trust	4,376	3.66	3.80 (3.21 to 4.48)	1.83	1.37 (0.87 to 2.30)	5.48	5.11 (4.16 to 6.45)	●
Northern Health and Social Care Trust [°]	4,040	2.23	3.71 (3.01 to 4.42)	1.98	1.44 (0.90 to 2.46)	4.21	4.90 (3.89 to 6.32)	●
Northern Lincolnshire and Goole Hospitals NHS Foundation Trust	4,561	3.95	3.85 (3.27 to 4.66)	1.10	1.15 (0.72 to 2.12)	5.04	5.07 (4.14 to 6.40)	●
Peterborough and Stamford Hospitals NHS Foundation Trust	4,886	4.09	3.84 (3.27 to 4.61)	1.23	1.18 (0.75 to 2.17)	5.32	5.09 (4.14 to 6.53)	●

Organisation	Total births [§]	Mortality rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Poole Hospital NHS Foundation Trust	4,536	*	3.68 (3.01 to 4.35)	*	0.95 (0.60 to 1.70)	2.65	4.42 (3.54 to 5.69)	●
Royal Berkshire NHS Foundation Trust	5,790	5.70	4.03 (3.38 to 5.17)	0.69	0.99 (0.63 to 1.76)	6.39	5.39 (4.45 to 6.83)	●
Royal Cornwall Hospitals NHS Trust	4,171	4.56	3.91 (3.35 to 4.78)	0.72	1.04 (0.65 to 1.87)	5.27	5.14 (4.14 to 6.57)	●
Royal Devon and Exeter NHS Foundation Trust	4,034	1.24	3.62 (2.87 to 4.33)	1.49	1.26 (0.78 to 2.18)	2.73	4.52 (3.62 to 5.75)	●
Royal Free London NHS Foundation Trust	8,087	2.84	3.60 (2.98 to 4.37)	0.50	0.87 (0.55 to 1.46)	3.34	4.22 (3.33 to 5.39)	●
Royal United Hospital Bath NHS Foundation Trust	4,320	2.78	3.74 (3.14 to 4.38)	1.62	1.31 (0.82 to 2.28)	4.40	4.91 (4.04 to 6.28)	●
Sandwell and West Birmingham Hospitals NHS Trust	5,577	6.10	3.98 (3.43 to 4.89)	2.35	1.52 (0.98 to 2.68)	8.43	5.73 (4.64 to 7.29)	●
South Eastern Health and Social Care Trust [°]	4,381	3.42	3.81 (3.22 to 4.53)	0.69	1.03 (0.64 to 1.81)	4.11	4.85 (3.91 to 5.98)	●
Southern Health and Social Care Trust [°]	5,910	3.55	3.82 (3.26 to 4.61)	2.21	1.62 (1.03 to 2.65)	5.75	5.38 (4.40 to 6.75)	●
Surrey and Sussex Healthcare NHS Trust	4,467	2.46	3.69 (3.05 to 4.41)	0.67	1.01 (0.67 to 1.76)	3.13	4.52 (3.62 to 5.78)	●
The Dudley Group NHS Foundation Trust	4,378	3.88	3.81 (3.12 to 4.57)	1.83	1.35 (0.87 to 2.44)	5.71	5.15 (4.18 to 6.55)	●
The Hillingdon Hospitals NHS Foundation Trust	4,020	*	3.76 (3.13 to 4.43)	*	0.89 (0.55 to 1.57)	4.23	4.60 (3.65 to 5.83)	●
The Mid Yorkshire Hospitals NHS Trust	6,302	5.40	4.00 (3.31 to 4.96)	1.75	1.39 (0.89 to 2.41)	7.14	5.67 (4.56 to 7.19)	●
The Princess Alexandra Hospital NHS Trust	4,241	2.59	3.73 (3.09 to 4.44)	0.95	1.10 (0.71 to 1.95)	3.54	4.69 (3.67 to 5.96)	●

Organisation	Total births [§]	Mortality rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [‡]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
The Shrewsbury and Telford Hospital NHS Trust	4,687	4.48	3.90 (3.31 to 4.73)	1.71	1.34 (0.90 to 2.34)	6.19	5.39 (4.36 to 6.95)	●
United Lincolnshire Hospitals NHS Trust	5,658	4.42	3.93 (3.33 to 4.81)	1.42	1.28 (0.87 to 2.21)	5.83	5.39 (4.39 to 6.82)	●
University Hospital of South Manchester NHS Foundation Trust	4,249	3.29	3.78 (3.14 to 4.58)	1.42	1.24 (0.81 to 2.16)	4.71	4.96 (3.94 to 6.28)	●
Walsall Healthcare NHS Trust	4,630	3.46	3.74 (3.12 to 4.46)	3.68	2.08 (1.24 to 3.86)	7.13	5.47 (4.45 to 6.95)	●
West Hertfordshire Hospitals NHS Trust	5,645	2.83	3.69 (3.10 to 4.33)	0.71	1.00 (0.62 to 1.70)	3.54	4.52 (3.62 to 5.67)	●
Western Health and Social Care Trust [°]	4,047	3.95	3.84 (3.23 to 4.67)	0.74	1.04 (0.65 to 1.84)	4.69	4.96 (3.93 to 6.24)	●
Western Sussex Hospitals NHS Foundation Trust	5,049	2.77	3.74 (3.08 to 4.42)	0.60	0.99 (0.63 to 1.73)	3.37	4.62 (3.67 to 5.91)	●
Worcestershire Acute Hospitals NHS Trust	5,749	3.65	3.82 (3.25 to 4.50)	1.75	1.39 (0.90 to 2.40)	5.39	5.19 (4.17 to 6.54)	●
York Teaching Hospital NHS Foundation Trust	5,007	4.59	3.94 (3.38 to 4.89)	1.61	1.32 (0.83 to 2.29)	6.19	5.46 (4.35 to 7.06)	●

[†] per 1,000 total births

[‡] per 1,000 live births

[§] excluding terminations of pregnancy and births <24⁺⁰ weeks gestational age

[°] different laws exist in Northern Ireland for the termination of pregnancy

* entry suppressed because of small number of deaths

[#] colours represent variation from comparator group average extended perinatal mortality rate

Data sources: MBRRACE-UK, NN4B, ONS, NRS, ISD, NIMATS, States of Guernsey, States of Jersey

Table 9: Crude and stabilised & adjusted stillbirth, neonatal, and extended perinatal mortality rates by NHS Trust (England), Health Board (Scotland and Wales), Health and Social Care Trust (Northern Ireland), and Crown Dependency based on place of birth: United Kingdom and Crown Dependencies, for births in 2014. FOR TRUSTS AND HEALTH BOARDS WITH 2,000 TO 3,999 BIRTHS ≥22⁺⁰ WEEKS GESTATIONAL AGE PER ANNUM

Organisation	Total births [§]	Mortality rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Average for comparator group			3.56		1.33		4.88	
Airedale NHS Foundation Trust	2,231	4.93	3.61 (2.98 to 4.27)	2.25	1.48 (0.89 to 2.61)	7.17	5.20 (4.02 to 6.83)	●
Barnsley Hospital NHS Foundation Trust	2,734	1.83	3.44 (2.80 to 4.09)	1.10	1.23 (0.74 to 2.30)	2.93	4.51 (3.51 to 5.76)	●
Bedford Hospital NHS Trust	2,992	3.68	3.54 (2.95 to 4.28)	2.35	1.55 (0.95 to 2.98)	6.02	5.04 (4.05 to 6.45)	●
Blackpool Teaching Hospitals NHS Foundation Trust	3,068	5.22	3.65 (3.02 to 4.55)	1.31	1.28 (0.78 to 2.21)	6.52	5.19 (4.15 to 6.74)	●
Burton Hospitals NHS Foundation Trust	3,279	3.35	3.53 (2.92 to 4.24)	1.22	1.26 (0.77 to 2.16)	4.57	4.80 (3.82 to 6.19)	●
Chesterfield Royal Hospital NHS Foundation Trust	2,851	3.86	3.57 (2.92 to 4.39)	1.76	1.40 (0.87 to 2.54)	5.61	5.03 (4.02 to 6.42)	●
Colchester Hospital University NHS Foundation Trust	3,840	4.95	3.66 (3.10 to 4.54)	0.79	1.13 (0.67 to 1.94)	5.73	5.06 (4.03 to 6.67)	●
Countess of Chester Hospital NHS Foundation Trust	3,026	2.31	3.47 (2.81 to 4.16)	1.32	1.28 (0.80 to 2.33)	3.64	4.63 (3.60 to 5.89)	●
Croydon Health Services NHS Trust	3,747	4.80	3.55 (3.01 to 4.32)	0.80	1.09 (0.65 to 1.96)	5.60	4.72 (3.80 to 5.88)	●
East Sussex Healthcare NHS Trust	3,320	*	3.46 (2.82 to 4.13)	*	1.10 (0.65 to 1.94)	3.01	4.47 (3.46 to 5.75)	●
Hinchingbrooke Health Care NHS Trust	2,286	*	3.53 (2.87 to 4.24)	*	1.04 (0.60 to 1.93)	3.06	4.60 (3.56 to 5.98)	●
Hywel Dda Health Board	3,231	2.17	3.46 (2.85 to 4.11)	1.55	1.37 (0.82 to 2.46)	3.71	4.67 (3.72 to 6.01)	●

Organisation	Total births [§]	Mortality rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
James Paget University Hospitals NHS Foundation Trust	2,173	4.14	3.57 (2.97 to 4.35)	1.39	1.28 (0.77 to 2.31)	5.52	4.93 (3.93 to 6.31)	●
Kettering General Hospital NHS Foundation Trust	3,493	3.72	3.56 (2.97 to 4.27)	2.59	1.66 (1.05 to 3.01)	6.30	5.17 (4.17 to 6.59)	●
Mid Cheshire Hospitals NHS Foundation Trust	2,694	3.71	3.56 (2.98 to 4.21)	2.98	1.73 (1.02 to 3.18)	6.68	5.22 (4.11 to 6.73)	●
Milton Keynes Hospital NHS Foundation Trust	3,655	3.01	3.46 (2.83 to 4.09)	1.65	1.37 (0.86 to 2.44)	4.65	4.69 (3.73 to 6.06)	●
NHS Forth Valley	3,289	2.74	3.50 (2.89 to 4.19)	1.52	1.35 (0.83 to 2.54)	4.26	4.76 (3.84 to 6.06)	●
NHS Highland	2,399	*	3.52 (2.89 to 4.20)	*	1.10 (0.67 to 1.97)	3.33	4.64 (3.64 to 5.98)	●
North Cumbria University Hospitals NHS Trust	3,073	1.95	3.45 (2.83 to 4.10)	2.28	1.55 (0.96 to 2.82)	4.23	4.76 (3.77 to 6.10)	●
Northumbria Healthcare NHS Foundation Trust	2,209	4.07	3.57 (3.01 to 4.22)	1.36	1.29 (0.80 to 2.22)	5.43	4.94 (3.94 to 6.41)	●
Royal Surrey County Hospital NHS Foundation Trust	3,067	3.26	3.53 (2.92 to 4.30)	0.98	1.20 (0.75 to 2.20)	4.24	4.75 (3.77 to 6.03)	●
Salisbury NHS Foundation Trust	2,334	2.57	3.50 (2.82 to 4.22)	1.29	1.27 (0.76 to 2.34)	3.86	4.69 (3.73 to 5.92)	●
Sherwood Forest Hospitals NHS Foundation Trust	3,456	2.60	3.48 (2.81 to 4.07)	3.77	2.10 (1.24 to 3.70)	6.37	5.20 (4.17 to 6.62)	●
South Warwickshire NHS Foundation Trust	2,551	4.31	3.59 (2.96 to 4.33)	1.97	1.43 (0.88 to 2.52)	6.27	5.12 (4.02 to 6.58)	●
Southend University Hospital NHS Foundation Trust	3,807	1.84	3.41 (2.68 to 4.17)	0.79	1.13 (0.70 to 2.01)	2.63	4.34 (3.28 to 5.62)	●
Southport and Ormskirk Hospital NHS Trust	2,622	*	3.48 (2.81 to 4.24)	*	1.09 (0.64 to 2.03)	2.67	4.51 (3.47 to 5.84)	●
St Helens and Knowsley Teaching Hospitals NHS Trust	3,776	*	3.53 (2.94 to 4.34)	*	0.99 (0.62 to 1.85)	3.71	4.58 (3.60 to 5.78)	●

Organisation	Total births [§]	Mortality rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Stockport NHS Foundation Trust	3,278	3.66	3.55 (2.97 to 4.38)	1.22	1.26 (0.77 to 2.42)	4.88	4.87 (3.83 to 6.27)	●
Tameside Hospital NHS Foundation Trust	2,417	*	3.70 (3.12 to 4.67)	*	1.02 (0.57 to 1.85)	6.62	5.12 (4.07 to 6.67)	●
Taunton and Somerset NHS Foundation Trust	3,245	5.24	3.67 (3.07 to 4.59)	1.24	1.26 (0.77 to 2.29)	6.47	5.24 (4.15 to 6.83)	●
The Ipswich Hospital NHS Trust	3,615	4.15	3.60 (3.02 to 4.36)	1.39	1.31 (0.80 to 2.25)	5.53	5.05 (4.05 to 6.46)	●
The Queen Elizabeth Hospital King's Lynn NHS Foundation Trust	2,317	3.02	3.52 (2.88 to 4.19)	1.73	1.37 (0.84 to 2.60)	4.75	4.85 (3.78 to 6.19)	●
The Rotherham NHS Foundation Trust	2,724	*	3.58 (3.02 to 4.32)	*	1.14 (0.67 to 2.07)	5.14	4.85 (3.83 to 6.34)	●
Torbay and South Devon NHS Foundation Trust	2,374	*	3.58 (2.96 to 4.34)	*	1.11 (0.65 to 2.02)	4.63	4.83 (3.82 to 6.22)	●
University Hospitals of Morecambe Bay NHS Foundation Trust	3,215	3.42	3.55 (2.93 to 4.34)	2.18	1.54 (0.95 to 2.85)	5.60	5.06 (4.04 to 6.39)	●
Warrington and Halton Hospitals NHS Foundation Trust	2,979	3.02	3.52 (2.90 to 4.21)	1.35	1.30 (0.82 to 2.36)	4.36	4.78 (3.84 to 6.08)	●
West Suffolk NHS Foundation Trust	2,529	*	3.54 (2.93 to 4.22)	*	1.10 (0.65 to 1.98)	3.56	4.68 (3.66 to 5.96)	●
Whittington Health	3,605	4.16	3.52 (2.96 to 4.19)	1.11	1.19 (0.78 to 2.12)	5.27	4.72 (3.80 to 6.09)	●
Wrightington, Wigan and Leigh NHS Foundation Trust	2,858	*	3.65 (3.06 to 4.42)	*	1.14 (0.69 to 2.11)	5.95	5.08 (4.01 to 6.56)	●

[†] per 1,000 total births

[‡] per 1,000 live births

[§] excluding terminations of pregnancy and births <24⁺⁰ weeks gestational age

[°] different laws exist in Northern Ireland for the termination of pregnancy

* entry suppressed because of small number of deaths

[#] colours represent variation from comparator group average extended perinatal mortality rate

Data sources: MBRRACE-UK, NN4B, ONS, NRS, ISD, NIMATS, States of Guernsey, States of Jersey

Table 10: Crude and stabilised & adjusted stillbirth, neonatal, and extended perinatal mortality rates by NHS Trust (England), Health Board (Scotland and Wales), Health and Social Care Trust (Northern Ireland), and Crown Dependency based on place of birth: United Kingdom and Crown Dependencies, for births in 2014. FOR TRUSTS AND HEALTH BOARDS WITH FEWER THAN 2,000 BIRTHS $\geq 22^{+0}$ WEEKS GESTATIONAL AGE PER ANNUM

Organisation	Total births [§]	Mortality rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Average for comparator group			3.23		0.95		4.18	
Dorset County Hospital NHS Foundation Trust	1,915	3.13	3.23 (2.35 to 4.14)	1.57	1.01 (0.51 to 2.15)	4.70	4.20 (3.10 to 5.89)	●
East Cheshire NHS Trust	1,737	*	3.26 (2.46 to 4.27)	*	0.81 (0.39 to 1.52)	4.03	4.12 (3.00 to 5.64)	●
Gateshead Health NHS Foundation Trust	1,795	5.01	3.28 (2.51 to 4.39)	1.68	1.01 (0.53 to 2.03)	6.69	4.38 (3.30 to 6.19)	●
George Eliot Hospital NHS Trust	1,906	*	3.16 (2.21 to 4.08)	*	0.93 (0.50 to 1.83)	2.62	3.95 (2.85 to 5.35)	●
Harrogate and District NHS Foundation Trust	1,870	*	3.21 (2.35 to 4.14)	*	0.87 (0.43 to 1.61)	3.21	4.04 (2.93 to 5.50)	●
Isle of Man Department of Health and Social Care	799	*	3.19 (2.30 to 4.13)	*	1.00 (0.55 to 1.99)	3.75	4.08 (2.98 to 5.54)	●
Isle of Wight NHS Trust	1,274	*	3.18 (2.25 to 4.14)	*	0.98 (0.52 to 1.95)	3.14	4.04 (2.92 to 5.46)	●
NHS Borders	1,111	*	3.30 (2.56 to 4.53)	*	0.99 (0.52 to 2.00)	8.10	4.43 (3.39 to 6.40)	●
NHS Dumfries and Galloway	1,272	*	3.20 (2.30 to 4.14)	*	0.90 (0.47 to 1.69)	3.14	4.04 (2.96 to 5.60)	●
NHS Orkney	135	*	3.24 (2.36 to 4.26)	*	0.91 (0.45 to 1.70)	*	4.16 (3.07 to 5.81)	●
NHS Shetland	153	*	3.22 (2.25 to 4.22)	*	0.91 (0.44 to 1.79)	*	4.09 (2.82 to 5.65)	●
NHS Western Isles	180	*	Δ	*	Δ	*	Δ	○
Northern Devon Healthcare NHS Trust	1,534	*	3.29 (2.52 to 4.41)	*	0.82 (0.39 to 1.65)	5.22	4.24 (3.18 to 6.02)	●
Powys Teaching Health Board	148	*	3.22 (2.26 to 4.16)	*	0.91 (0.46 to 1.74)	*	4.09 (2.99 to 5.61)	●
South Tyneside NHS Foundation Trust	1,342	*	3.21 (2.29 to 4.20)	*	0.89 (0.46 to 1.82)	3.73	4.06 (3.03 to 5.50)	●

Organisation	Total births [§]	Mortality rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
States of Guernsey Health and Social Services	616	*	3.21 (2.32 to 4.18)	*	0.95 (0.49 to 1.88)	*	4.09 (2.92 to 5.51)	●
States of Jersey Health and Social Services	976	*	3.18 (2.26 to 4.12)	*	0.85 (0.43 to 1.68)	*	3.93 (2.80 to 5.21)	●
The Portland (HCA Health Care)	1,652	*	3.17 (2.27 to 4.04)	*	0.94 (0.51 to 1.79)	3.03	3.99 (2.91 to 5.54)	●
The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	299	*	3.21 (2.25 to 4.25)	*	0.90 (0.45 to 1.74)	*	4.05 (2.93 to 5.57)	●
Weston Area Health NHS Trust	200	*	3.21 (2.32 to 4.15)	*	0.90 (0.48 to 1.76)	*	4.07 (2.95 to 5.49)	●
Wye Valley NHS Trust	1,733	*	3.28 (2.43 to 4.29)	*	0.95 (0.51 to 1.90)	5.77	4.31 (3.17 to 6.15)	●
Yeovil District Hospital NHS Foundation Trust	1,528	*	3.31 (2.51 to 4.51)	*	0.89 (0.46 to 1.75)	6.54	4.37 (3.30 to 6.09)	●

[†] per 1,000 total births

[‡] per 1,000 live births

[§] excluding terminations of pregnancy and births <24⁺⁰ weeks gestational age

[°] different laws exist in Northern Ireland for the termination of pregnancy

[△] stabilised & adjusted rate not calculated due to unavailability of some individual level data

* entry suppressed because of small number of deaths

[#] colours represent variation from comparator group average extended perinatal mortality rate

Data sources: MBRRACE-UK, NN4B, ONS, NRS, ISD, NIMATS, States of Guernsey, States of Jersey

3.4 How local organisations should respond to this information

This information is intended to give local teams an insight into clinical performance based not just on crude mortality rates but also having taken account of at least some important socio-demographic factors that influence pregnancy outcomes.

For any commissioning organisation, Trust or Health Board whose performance falls in the red band ● a more detailed local review of individual deaths is indicated to try and assess the deaths that were potentially avoidable or to investigate local factors that might explain the high rate. For example, data quality might not be sufficiently good to allow for the effect of the proportion of mothers who for legal, cultural or religious reasons choose to carry babies affected by severe congenital anomalies to term. Inevitably this will involve the co-operation of a range of clinical disciplines and, almost inevitably, a number of provider organisations in order to explore the whole

care pathway for all babies that were included as part of the analysis. In some cases this will be limited to a small number of units but in other parts of the UK it will involve multiple delivery sites. For those in the amber band ● similar reviews should be carried out. However, the decision to carry out more detailed local review should also reflect local aspiration in terms of performance when local socio-demographic factors have been taken into account, i.e. whether simply avoiding a rate 10% higher than the national average is good enough. For those who choose to wait for further data in order to gain a better perspective over time, encouraging local delivery sites to fully engage with MBRRACE-UK data collection will ensure that, going forward, estimates are more precise.

MBRRACE-UK Recommendation

All organisations identified as having a stabilised & adjusted extended perinatal mortality rate that falls in the red or amber band should conduct a local review. This should include data checking for case validation and data quality, followed by a full review of the care provision for all stillbirths and neonatal deaths in order to identify any local factors which might be responsible for their reported high stabilised & adjusted mortality rate. The review should also establish whether there are lessons to be learned to improve the quality of care provision within their organisation. Recommendations from the Kirkup report [3] indicate that rigorous clinical review should be carried out for all stillbirths and neonatal deaths and therefore such reviews should also be carried out for those who are in the yellow ● and green ● bands. Additional justification for this approach would be if the local aspiration is not simply to be average for the UK but to seek levels of clinical performance that compare with those achieved in other parts of the developed world, particularly the Nordic countries.

MBRRACE-UK Recommendation

All organisations, irrespective of their extended perinatal mortality rate, should investigate individual stillbirths and neonatal deaths using a standardised process and independent, multidisciplinary peer review as recommended in the Report of the Morecambe Bay Investigation [3]. The information within the MBRRACE-UK Perinatal Surveillance Reports (including the reports for individual Trusts and Health Boards) and recommendations from MBRRACE-UK Confidential Enquiries can facilitate this process [4, 5].

References

1. Manktelow BN, Smith LK, Evans TA, Hyman-Taylor P, Kurinczuk JJ, Field DJ, Smith PW, Draper ES, on behalf of the MBRRACE-UK Collaboration. *Perinatal Mortality Surveillance Report, UK Perinatal Deaths for Births from January to December 2013*. The Infant Mortality and Morbidity Studies, Department of Health Sciences, University of Leicester: Leicester, 2015.
2. Manktelow BN, Smith LK, Evans TA, Hyman-Taylor P, Kurinczuk JJ, Field DJ, Smith PW, Mielewczyk F, Draper ES, on behalf of the MBRRACE-UK Collaboration. *MBRRACE-UK Perinatal Mortality Surveillance Report, UK Perinatal Deaths for Births from January to December 2013 - Supplementary Report: UK Trusts and Health Boards*. The Infant Mortality and Morbidity Studies, Department of Health Sciences, University of Leicester: Leicester, 2015.

3. Kirkup B. *The Report of the Morecambe Bay Investigation: An independent investigation into the management, delivery and outcomes of care provided by the maternity and neonatal services at the University Hospitals of Morecambe Bay NHS Foundation Trust from January 2004 to June 2013 available online at: <https://www.gov.uk/government/publications>.*, 2015.
4. Draper ES, Kurinczuk JJ, Kenyon S, on behalf of MBRRACE-UK. *MBRRACE-UK 2015 Perinatal Confidential Enquiry: Term, singleton, normally-formed, antepartum stillbirth*. The Infant Mortality and Morbidity Studies, Department of Health Sciences, University of Leicester: Leicester, 2015.
5. Field DJ, Hyman-Taylor P, Bacon C, Draper ES, on behalf of MBRRACE-UK. *Perinatal confidential Enquiry - Congenital Diaphragmatic Hernia*. The Infant Mortality and Morbidity Studies Department of Health Sciences, University of Leicester: Leicester, 2014.



4. High risk births and their contribution towards the variations in mortality rates

MBRRACE-UK provides stabilised & adjusted rates of stillbirths, neonatal deaths, and extended perinatal mortality to facilitate direct comparisons between health care providers and between populations. In this report, all late fetal losses and deaths of babies born alive at less than 24 weeks gestational age have been excluded from the main analyses. However, deaths due to congenital anomalies have been included. This chapter discusses the rationale behind these decisions and the way in which future analyses will be developed and presented.

4.1 Mortality among babies born at less than 24 weeks gestational age

MBRRACE-UK aims to report all deaths from 22⁺⁰ weeks gestational age onwards as recommended by the World Health Organization (WHO) [1], which would allow direct comparisons to be made with other European countries and the mortality statistics reported by the Statistical Office of the European Union (EUROSTAT) [2]. However, unlike many other European countries which have statutory registration of all births from 22⁺⁰ weeks gestational age, in the UK statutory registration differs between live and stillbirths with no legal requirement to register late fetal losses (i.e. those without signs of life at birth) born before 24⁺⁰ weeks gestational age. The MBRRACE-UK data reporting includes fetal losses at 22⁺⁰ to 23⁺⁶ weeks gestational age in addition to all officially registered neonatal deaths and stillbirths in order to allow, ultimately, the presentation of data for all deaths from 22⁺⁰ weeks gestational age onwards.

As discussed in Chapter 2, there are no easily accessible routine data sources for late fetal losses delivered at 22⁺⁰ to 23⁺⁶ weeks gestational age and, therefore, unlike all other stillbirths and neonatal deaths, it is not possible to systematically ensure that all of these deaths have been reported to MBRRACE-UK. It is vital that all Trusts and Health Boards responsible for maternity services should have systematic processes in place to ensure that all births between 22⁺⁰ and 23⁺⁶ weeks gestational age who are not alive at delivery, or who do not survive the neonatal period, are reported.

MBRRACE-UK Recommendation

All organisations responsible for maternity services should have systematic processes in place in order to ensure that all births between 22⁺⁰ and 23⁺⁶ weeks gestational age who are not alive at delivery or who do not survive the neonatal period are reported to MBRRACE-UK.

For 2013, the first year of data collection for MBRRACE-UK, it was clear that not all Trusts and Health Boards had such processes in place. There was clear variation between organisations and an overall shortfall in reported deaths compared with that expected based on a recent comprehensive study of births at this gestational age [3]. It is evident that for births in 2014 there has been a significant improvement in the reporting of late fetal losses compared to the first year of data collection. For births in 2013, only 874 births at 22⁺⁰ to 23⁺⁶ weeks gestational age were reported compared to 1,477 total births at 24⁺⁰ to 25⁺⁶ weeks, while for 2014 there were 1,010 total births at 22⁺⁰ to 23⁺⁶ weeks gestational age,

compared to 1,411 total births at 24⁺⁰ to 25⁺⁶ weeks. Given that complete ascertainment/reporting cannot be confirmed at this stage, in this report, as in 2013, these babies are reported separately. We will continue to monitor the reporting of this group going forward.

In this report, by using the cut-off of 24⁺⁰ weeks gestational age, the number of neonatal deaths reported was reduced by 376 deaths which equates to a decrease in the overall neonatal and extended perinatal mortality rates of approximately 0.5 per 1,000 births. This must be borne in mind when interpreting the results presented in this report, compared with other national and international mortality rates.

In Table 11, the number of births, stillbirths, neonatal deaths, and extended perinatal deaths are shown together with the associated mortality rates for the UK and Crown Dependencies. In the UK in 2014 there were 1,010 births at 22⁺⁰ to 23⁺⁶ weeks gestational age (excluding terminations of pregnancy) of which 438 were born at 22⁺⁰ to 22⁺⁶ weeks gestational age and 572 at 23⁺⁰ to 23⁺⁶ weeks gestational age. All births where a birth weight was recorded (918 out of 1,010 births) were less than 1500g, with 47% of births having a recorded birth weight less than 500g.

Rates of mortality were extremely high for births at 22⁺⁰ to 23⁺⁶ weeks of gestational age with 499 late fetal losses (494.1 per 1,000 total births) and 376 neonatal deaths (735.8 per 1,000 live births) with the majority of neonatal deaths occurring within the first day of life (254 of the 376 deaths). Only 13.4% (approximately 1 in 7) of the total births survived the neonatal period.

Table 11: Stillbirth, neonatal, and extended perinatal mortality rates for births at 22⁺⁰ to 23⁺⁶ weeks gestational age: United Kingdom and Crown Dependencies for births in 2014

	Births at 22 ⁺⁰ -23 ⁺⁶ weeks gestational age	
	Number of births	Rate per 1000 births
Total births	1,010	
Live births	511	
Late fetal losses	499	494.1[†]
<i>Antepartum</i>	271	268.3 [†]
<i>Intrapartum</i>	162	160.4 [†]
<i>Unknown timing</i>	64	63.4 [†]
Neonatal deaths	376	735.8[‡]
<i>Early neonatal death</i>	335	655.6 [‡]
<i>Late neonatal death</i>	41	80.2 [‡]
Perinatal deaths	834	825.7[†]
Extended perinatal deaths	875	866.3[†]

[†] per 1,000 total births

[‡] per 1,000 live births

Data sources: MBRRACE-UK, ONS, NN4B, NRS, ISD, NIMATS, States of Guernsey, States of Jersey

4.2 Deaths due to congenital anomalies

The approach to the management of pregnancies affected by a congenital anomaly varies widely between care providers in the UK. The main factors influencing their management relate to differences in legislation or the cultural and religious differences of the populations served. In Northern Ireland termination of pregnancy is not legal in most circumstances and, therefore, the rates of perinatal death associated with congenital anomalies would be expected to be higher than in the rest of the UK where the law allows for the termination of a pregnancy in specific circumstances and particularly

in the presence of a congenital anomaly. Thus, this will have a major impact on overall mortality rates observed in Northern Ireland and may account for the high rate of neonatal mortality in 2014. Similarly, in areas where there is a high proportion of births from groups with religious and cultural sensitivities that discourage termination of pregnancy, higher rates of death associated with congenital anomalies would also be anticipated. This section focuses on those deaths ascribed to a congenital anomaly in order to investigate the impact of congenital anomalies on the overall variation in mortality rates.

The main reason that deaths due to congenital anomalies have not been excluded from the main analyses in this report is the potential inconsistencies in the coding of the cause of death by Trusts and Health Boards using the CODAC system of classification. Table 12 provides details of the stillbirths and neonatal deaths where the main cause of death was attributed to a congenital anomaly (CODAC level 1) showing CODAC level 2, which provides information about the system affected by the anomaly, and CODAC level 3, which provides information about the specific anomaly, for categories where the total number of deaths is greater than 10.

Table 12: Number of stillbirths and neonatal deaths where the primary cause of death was coded as congenital anomaly by CODAC level 1, 2 and 3: United Kingdom and Crown Dependencies, for births in 2014

CODAC cause of death	Stillbirths [§]		Neonatal deaths [§]	
	Number	(%)	Number	(%)
Unspecified	40	(19.1)	49	(12.7)
Central Nervous System	25	(12.0)	37	(9.6)
<i>Anencephaly</i>	13	(6.2)	19	(4.9)
Cardiovascular System	30	(14.4)	90	(23.3)
<i>Complex congenital heart disease</i>	20	(9.6)	75	(19.4)
Genitourinary	10	(4.8)	40	(10.4)
<i>Autosomal recessive polycystic kidney</i>	2	(1.0)	10	(2.6)
<i>Cystic renal dysplasia</i>	2	(1.0)	8	(2.1)
<i>Renal agenesis</i>	3	(1.4)	8	(2.1)
Skeletal	8	(3.8)	17	(4.4)
Respiratory and Diaphragm	10	(4.8)	87	(22.5)
<i>Pulmonary vascular anomalies</i>	1	(0.5)	18	(4.7)
<i>Diaphragmatic hernia</i>	4	(1.9)	42	(10.9)
Gastrointestinal	6	(2.9)	13	(3.4)
Trisomies	59	(28.2)	42	(10.9)
<i>Trisomy 18 (isolated or with other anomalies)</i>	26	(12.4)	21	(5.4)
<i>Trisomy 21 (isolated or with other anomalies)</i>	24	(11.5)	2	(0.5)
Aneuploidy	17	(8.1)	9	(2.3)
Amniotic Band	4	(1.9)	2	(0.5)
TOTAL	209	(100.0)	386	(100.0)

[§] excluding terminations of pregnancy and births <24⁺ weeks gestational age

Data sources: MBRRACE-UK

In 2014 the primary cause of death was ascribed to a congenital anomaly in 209 stillbirths and 386 neonatal deaths. This represents 6.4% of stillbirths, 27.5% of neonatal deaths, and 12.7% of extended perinatal deaths: an overall increase in extended perinatal deaths of 1.8% from 2013.

On the MBRRACE-UK reporting system reporters are asked to complete both a primary cause of death and up to two associated conditions. Review of the codes entered for the associated conditions has shown that congenital anomalies are included in the associated conditions for a further 66 stillbirths and 66 neonatal deaths. This represents an additional 2.0% of stillbirths (an overall rate of 8.4%) and an additional 4.9% of neonatal deaths (an overall rate of 32.8%). Including congenital anomalies coded within the associated conditions the percentage of extended perinatal deaths related to congenital anomalies is 15.6%. Table 13 includes the additional congenital anomalies coded as associated conditions to show the overall impact by anomaly group.

Table 13: Number of stillbirths and neonatal deaths where either the primary cause of death or any associated condition was coded as congenital anomaly by CODAC level 1, 2 and 3: United Kingdom and Crown Dependencies, for births in 2014

CODAC cause of death	Stillbirths [§]		Neonatal deaths [§]	
	Number	(%)	Number	(%)
Unspecified	45	(16.4)	53	(11.7)
Central Nervous System	29	(10.5)	43	(9.5)
<i>Anencephaly</i>	14	(5.1)	20	(4.4)
Cardiovascular System	37	(13.5)	109	(24.1)
<i>Complex congenital heart disease</i>	23	(8.4)	89	(19.6)
Genitourinary	17	(6.2)	53	(11.7)
<i>Autosomal recessive polycystic kidney</i>	5	(1.8)	13	(2.9)
<i>Cystic renal dysplasia</i>	3	(1.1)	9	(2.0)
<i>Renal agenesis</i>	4	(1.5)	10	(2.2)
Skeletal	15	(5.5)	20	(4.4)
Respiratory and Diaphragm	14	(5.1)	98	(21.7)
<i>Pulmonary vascular anomalies</i>	3	(1.1)	19	(4.2)
<i>Diaphragmatic hernia</i>	5	(1.8)	50	(11.0)
Gastrointestinal	18	(6.5)	15	(3.3)
Trisomies	74	(26.9)	47	(10.4)
<i>Trisomy 18 (isolated or with other anomalies)</i>	29	(10.5)	21	(4.6)
<i>Trisomy 21 (isolated or with other anomalies)</i>	35	(12.7)	5	(1.1)
Aneuploidy	21	(7.6)	12	(2.7)
Amniotic Band	5	(1.8)	2	(0.4)
TOTAL	275	(100.0)	452	(100.0)

[§] excluding terminations of pregnancy and births <24⁺⁰ weeks gestational age

Data sources: MBRRACE-UK

To be coded as a cause of death using the CODAC system of classification, conditions should have significant lethality (5% or more) and, where there are two equally significant conditions, the first to occur would be the one coded as the primary cause of death. In most situations where there is a major congenital anomaly this would therefore be coded as the primary cause of death. Most deaths where a congenital anomaly was included as an associated condition were classified as either 'fetal' or 'neonatal' within the main CODAC system. It is unclear whether this was an informed decision or simply represents a lack of experience or familiarity with the CODAC classification system. MBRRACE-UK has a working group to help develop training materials and advice for reporters on the use of the CODAC system as well as a frequently asked questions (FAQs) section on the website.

Table 14 illustrates the current problems with the primary cause of death coding for congenital anomalies and the reason why such cases have not, to date, been excluded from our analyses. The Table shows the proportion of deaths ascribed to congenital anomalies by the relevant comparator group for Trusts and Health Boards used to present the mortality rates in the earlier sections of the report. This shows that using the primary cause of death alone across four of the comparator groups there are some Trusts and Health Boards reporting no deaths due to congenital anomalies and, even in the Level 3 NICU and Neonatal Surgery group, at least one organisation has only 6.1% of their cases where the death was ascribed to a congenital anomaly. When congenital anomalies reported as associated conditions are added there were still organisations where no deaths were reported to be due to congenital anomalies across four of the comparator groups and in the Level 3 NICU and Neonatal Surgery group one organisation reported this combination for just 10% of their deaths whilst, at the other extreme, another reported congenital anomaly to be associated with 54.1% of their deaths. It is highly improbable that there were no deaths due to congenital anomalies for babies born in a Trust or Health Board with a level 3 NICU.

Table 14: Extended perinatal deaths with congenital anomaly as primary cause of death: United Kingdom and Crown Dependencies, for births in 2014

Comparator group for Trusts and Health Board of birth	Deaths with congenital anomaly as main cause of death [§]	(%)	Range: minimum to maximum
Level 3 NICU & neonatal surgery	301 / 1575	(19.1)	6.1% to 52.7%
Level 3 NICU	104 / 1063	(9.8)	0% to 25.0%
4,000 or more births	143 / 1318	(10.8)	0% to 50.0%
2,000 to 3,999 births	34 / 568	(6.0)	0% to 25.0%
Fewer than 2,000 births	8 / 101	(7.9)	0% to 25.0%
Overall	590 / 4625	(12.7)	0% to 52.7%

[§] excluding terminations of pregnancy and births <24⁺⁰ weeks gestational age

Data sources: MBRRACE-UK

Table 15: Extended perinatal deaths with congenital anomaly as primary or associated cause of death: United Kingdom and Crown Dependencies, for births in 2014

Comparator group for Trusts and Health Board of birth	Deaths with congenital anomaly as any cause of death [§]	(%)	Range: minimum to maximum
Level 3 NICU & neonatal surgery	361 / 1575	(22.9)	10.0% to 54.1%
Level 3 NICU	134 / 1063	(12.6)	0% to 25.6%
4,000 or more births	176 / 1318	(13.4)	0% to 55.9%
2,000 to 3,999 births	42 / 568	(7.4)	0% to 25.0%
Fewer than 2,000 births	11 / 101	(10.9)	0% to 33.3%
Overall	724 / 4625	(15.7)	0% to 54.1%

[§] excluding terminations of pregnancy and births <24⁺⁰ weeks gestational age

Data sources: MBRRACE-UK

The variation in the percentage of extended perinatal deaths by Trust or Health Board of birth due to a congenital anomaly using the primary cause of death from CODAC is shown in Figure 16. The highest percentages of deaths due to congenital anomaly (in excess of 30% - pink dots) are seen in Northern Ireland as expected (because of the different legal framework in relation to termination of pregnancy),

although other Trusts and Health Boards across the whole of the UK have percentages between 20.0% and 29.9%. In Figure 17, associated conditions indicating a death from a congenital anomaly have been added to the primary cause of the death; the highest rates of congenital anomalies of 30% or more are present in a small number of Trusts and Health Boards in Scotland and England as well as in Northern Ireland. However, wide variation in the reporting of congenital anomaly as the cause of death can still be seen, with many Trusts and Health Boards reporting this cause for less than 5% of their deaths. At present, it seems highly likely that the improbably low percentage of deaths ascribed to congenital anomalies in some Trusts and Health Boards is due to coding errors. Over time, with increasing expertise in the coding of the cause of death, we anticipate that coding will improve and our analyses of this information will be extended.



Figure 16: Percentage of extended perinatal deaths with the primary cause of death recorded as congenital anomaly by NHS Trust (England), Health Board (Scotland and Wales), Health and Social Care Trust (Northern Ireland), and Crown Dependency based on place of birth: United Kingdom and Crown Dependencies, for births in 2014

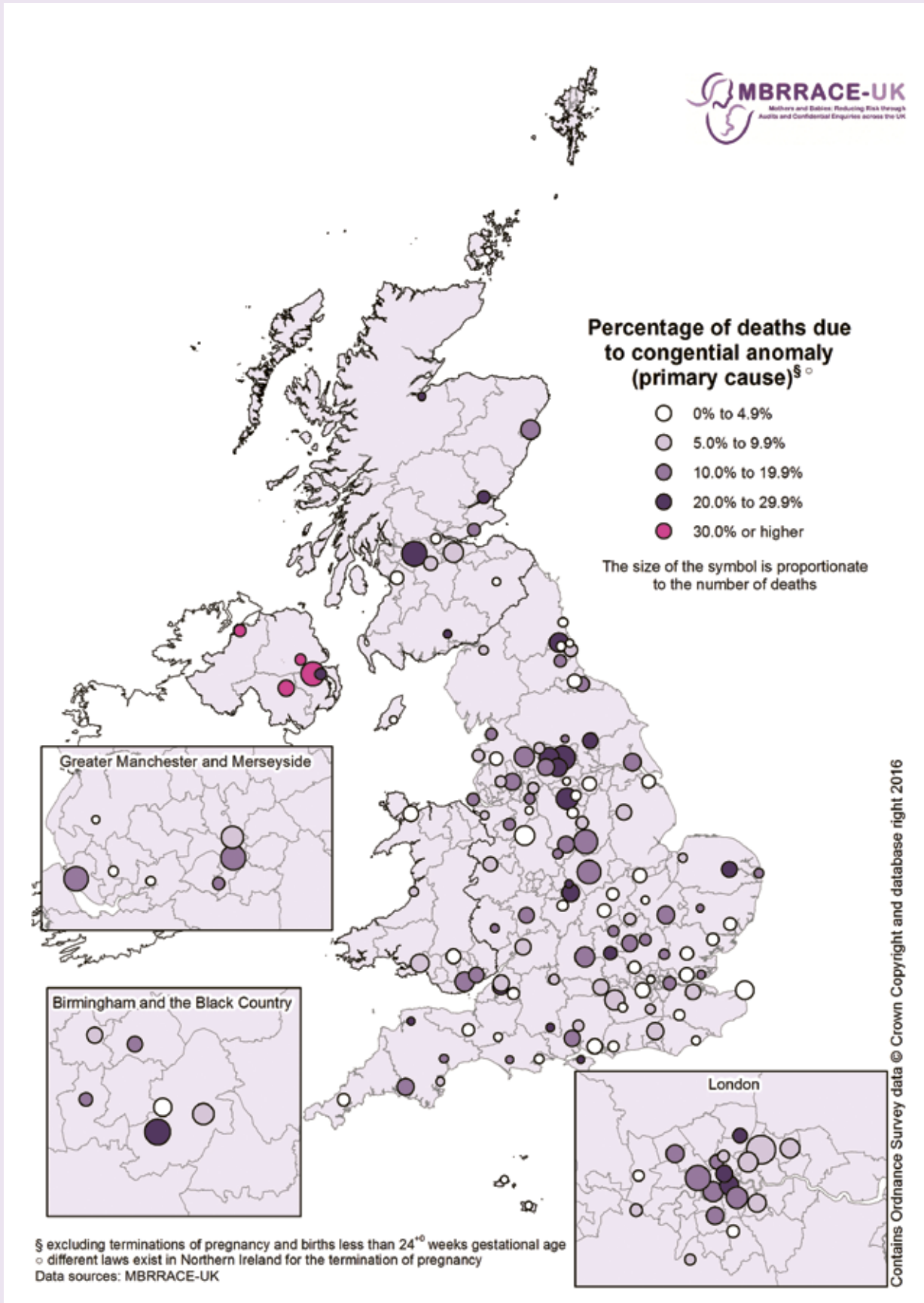
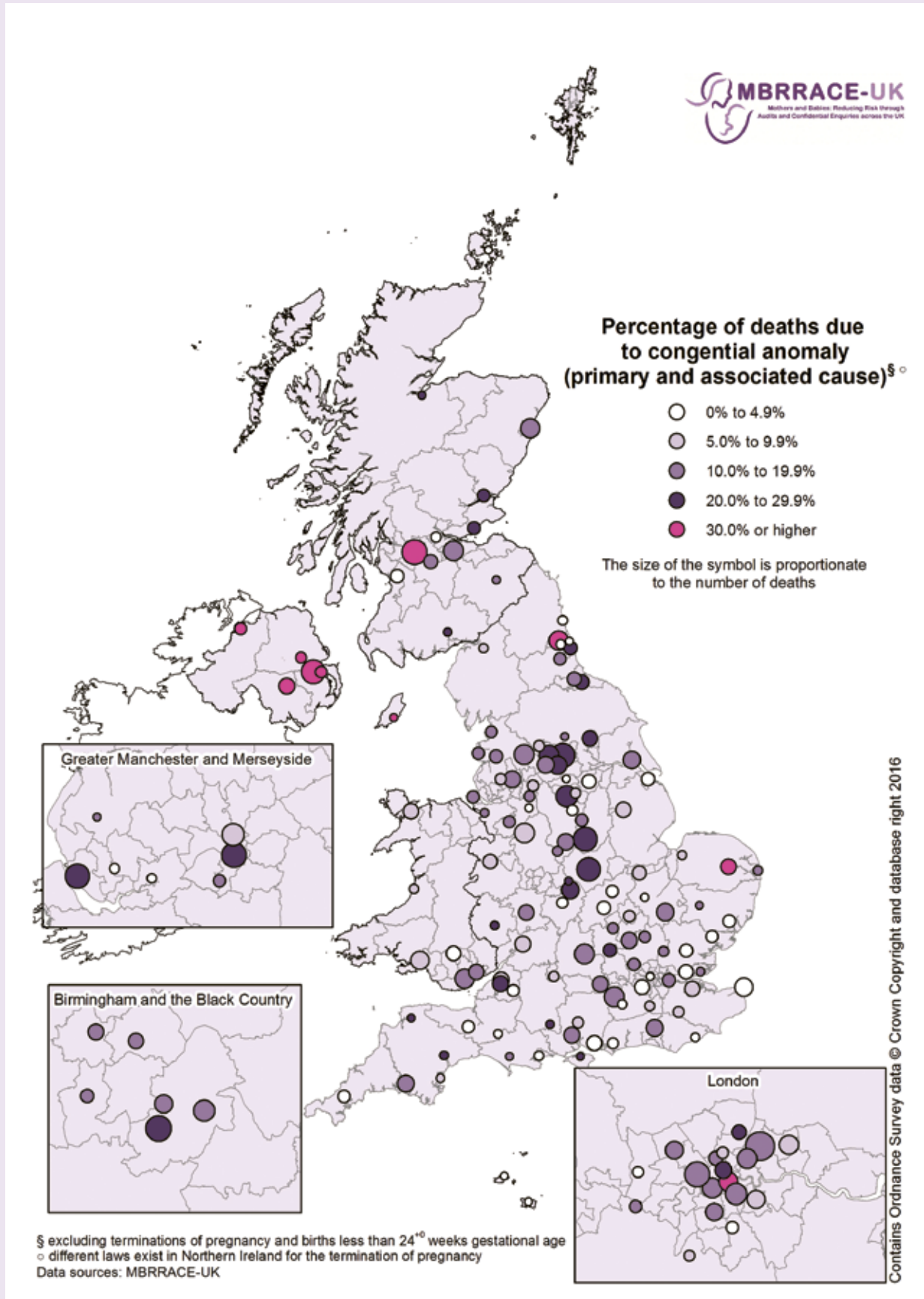


Figure 17: Percentage of extended perinatal deaths with the primary or associated cause of death recorded as congenital anomaly by NHS Trust (England), Health Board (Scotland and Wales), Health and Social Care Trust (Northern Ireland), and Crown Dependency based on place of birth: United Kingdom and Crown Dependencies, for births in 2014



References

1. World Health Organization. Maternal and perinatal health. Available online at: http://www.who.int/maternal_child_adolescent/topics/maternal/maternal_perinatal/en/. WHO: 2015.
2. Eurostat. Eurostat your key to European statistics. Available online at: <http://ec.europa.eu/eurostat>, Brussels: European Commission, 2016.
3. Costeloe KL, Hennessy EM, Haider S, Stacey F, Marlow N, Draper ES. Short term outcomes after extreme preterm birth in England: comparison of two birth cohorts in 1995 and 2006 (the EPICure studies). *BMJ* 2012; **345**: e7976.

5. Causes of death

Perinatal deaths reported to MBRRACE-UK are classified by cause of death using the CODAC classification system [1]. The CODAC system uses a three level hierarchical tree of coded causes of death, a full description of which can be found at the CODAC website <http://codac-classification.org/> The CODAC level 1 classification is presented in Table 16 for all stillbirths, neonatal deaths, and extended perinatal deaths for babies born at 24 weeks gestational age or later in 2014. One of the main uses of a system for the classification of death is to direct the targeting of interventions to reduce specific types of death. CODAC offers the potential to give insight into opportunities where the different clinical management of the mother or baby may have led to a different outcome.

For births in 2014 the percentage of stillbirths and neonatal deaths attributed to an intrapartum cause of death was 5.8% and 4.8% respectively. This is a reduction from 8.8% and 6.5% for births in 2013 which may, in part, reflect an overall improvement in perinatal care provision but could also be due to improvements in the expertise and quality of coding using the CODAC system. This important group of deaths will be reviewed as part of the next MBRRACE-UK perinatal confidential enquiry where these issues can be closely scrutinised.

Half of all stillbirths and just under a tenth of neonatal deaths were attributed to either the Unknown or Missing categories of the CODAC classification system. Whilst both figures show a small improvement over the 2013 data, more work is required to increase the coding expertise of reporters across the UK.

Table 16: Number of stillbirths, neonatal deaths, and extended perinatal deaths by CODAC level 1 cause of death: United Kingdom and Crown Dependencies, for births in 2014

CODAC cause of death: level 1	Stillbirths [§]		Neonatal deaths [§]		Extended perinatal deaths [§]	
	Number	(%)	Number	(%)	Number	(%)
Infection	100	(3.1)	101	(7.3)	201	(4.3)
Neonatal	47	(1.4)	610	(44.1)	657	(14.2)
Intrapartum	189	(5.8)	67	(4.8)	256	(5.5)
Congenital anomaly	209	(6.4)	386	(27.9)	595	(12.8)
Fetal	149	(4.6)	67	(4.8)	216	(4.7)
Cord	129	(4.0)	2	(0.1)	131	(2.8)
Placenta	712	(21.9)	24	(1.7)	736	(15.9)
Maternal	114	(3.5)	4	(0.3)	118	(2.5)
Unknown	1499	(46.0)	71	(5.1)	1570	(33.8)
Missing	110	(3.4)	52	(3.8)	162	(3.5)

[§] excluding terminations of pregnancy and births <24⁺⁰ weeks gestational age

Data sources: MBRRACE-UK

MBRRACE-UK provides additional guidance on the use of CODAC and has established a Classification of Death Interest Group and new FAQs have been added to the MBRRACE-UK online reporting system.

MBRRACE-UK Recommendation

All Trusts and Health Boards work closely with MBRRACE-UK to improve their coding of the cause of death, based on the CODAC classification system, in order to facilitate the appropriate targeting of interventions to reduce specific types of death.

Table 17: Number of neonatal deaths by CODAC level 1 and level 2 cause of death: United Kingdom and Crown Dependencies, for births in 2014

CODAC cause of death	Neonatal deaths [§]	
	Number	(%)
Infection	101	(7.3)
Neonatal	610	(44.1)
<i>Unspecified or other</i>	19	(1.4)
<i>Extreme prematurity</i>	176	(12.7)
<i>Neurological</i>	179	(12.9)
<i>Cardio-respiratory</i>	154	(11.1)
<i>Gastrointestinal</i>	55	(4.0)
<i>Multi-organ failure</i>	23	(1.7)
<i>Trauma or suffocation</i>	4	(0.3)
Intrapartum	67	(4.8)
Congenital anomaly	386	(27.9)
Fetal	67	(4.8)
Cord	2	(0.1)
Placenta	24	(1.7)
Maternal	4	(0.3)
Unknown	71	(5.1)
Missing	52	(3.8)

§ excluding terminations of pregnancy and births <24⁺⁰ weeks gestational age

Data sources: MBRRACE-UK

Although CODAC was developed for use primarily with stillbirth, the proportion of neonatal deaths attributed to an unknown or missing cause in 2014 was less than 10% (Table 16), substantially less than for stillbirths. Approximately 44% of the neonatal deaths in 2014 were attributed to a neonatal cause and in Table 17 level 2 of the CODAC tree is shown for these neonatal causes of death. All but 19 neonatal deaths were categorised to clearly defined CODAC level 2 categories. Work to compare CODAC coded deaths with those coded using the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10), available from routine mortality data sources, is still ongoing and facilitating the continued development of the MBRRACE-UK FAQs. This work will feed into international discussions and developments of the classification of stillbirths and neonatal deaths. Improving the accuracy and completeness of the MBRRACE-UK data collection (including the cause of death using the CODAC death classification system) and identifying the lessons learned in the future from the results of local multidisciplinary reviews, will potentially provide the additional information to develop our understanding of the factors which may influence UK mortality rates.

5.1 Post-mortem examination

Information about the offer of post-mortem and whether consent was obtained is collected by MBRRACE-UK and the data for 2014 births is presented in Table 18. Rates for consent to post-mortem for 2014 are very similar to those reported in 2013 with fewer than half of the parents of stillborn babies and only a quarter of the parents of neonates who died providing consent for full post-mortem. However, the offer of a post-mortem to parents was reported in over 95% of all stillbirths and slightly less than 80% of neonatal deaths; an overall figure of around 90% for extended perinatal deaths. Across the UK, Trusts and Health Boards showed a wide variation in the offer of a post-mortem for extended perinatal deaths (Figure 18): just under half of Trusts and Health Boards reporting that all deaths were offered a post-mortem, whereas in around a quarter of Trusts and Health Boards a post-mortem was offered for less than 90% of deaths.

The difference between the proportion of deaths where post-mortem was offered and the uptake of the offer by parents is a personal choice, unless a post mortem is requested by the coroner. However, the manner in which a post-mortem is offered has a direct effect on the uptake. Whilst a post-mortem following stillbirth may not provide a definitive diagnosis of the cause of death, the process can exclude some of the potential causes and provide valuable information for the counselling of parents for future pregnancies. Similarly, for neonatal deaths where the cause is felt to be known by the clinical team, a post-mortem may identify additional conditions or congenital anomalies that would contribute important information for parental counselling.

Placental histology is the single most important component of the investigation of stillbirths and in 2014 this was carried out for 2,837 out of 3,208 (88.4%) stillbirths. A key area for action from our recent confidential enquiry in term, singleton, normally formed antepartum stillbirths [2] was that placental histology should if possible be undertaken by a specialist pathologist unless there are specific contraindications.

MBRRACE-UK Recommendation

A post-mortem examination should be offered in all cases of stillbirth and neonatal death in order to identify the cause of death where possible, to exclude potential contributory factors and to improve the future pregnancy counselling of parents. For stillbirths, regardless of whether consent is provided for post-mortem examination, the placenta should always be submitted for histological examination, preferably by a specialist pathologist.

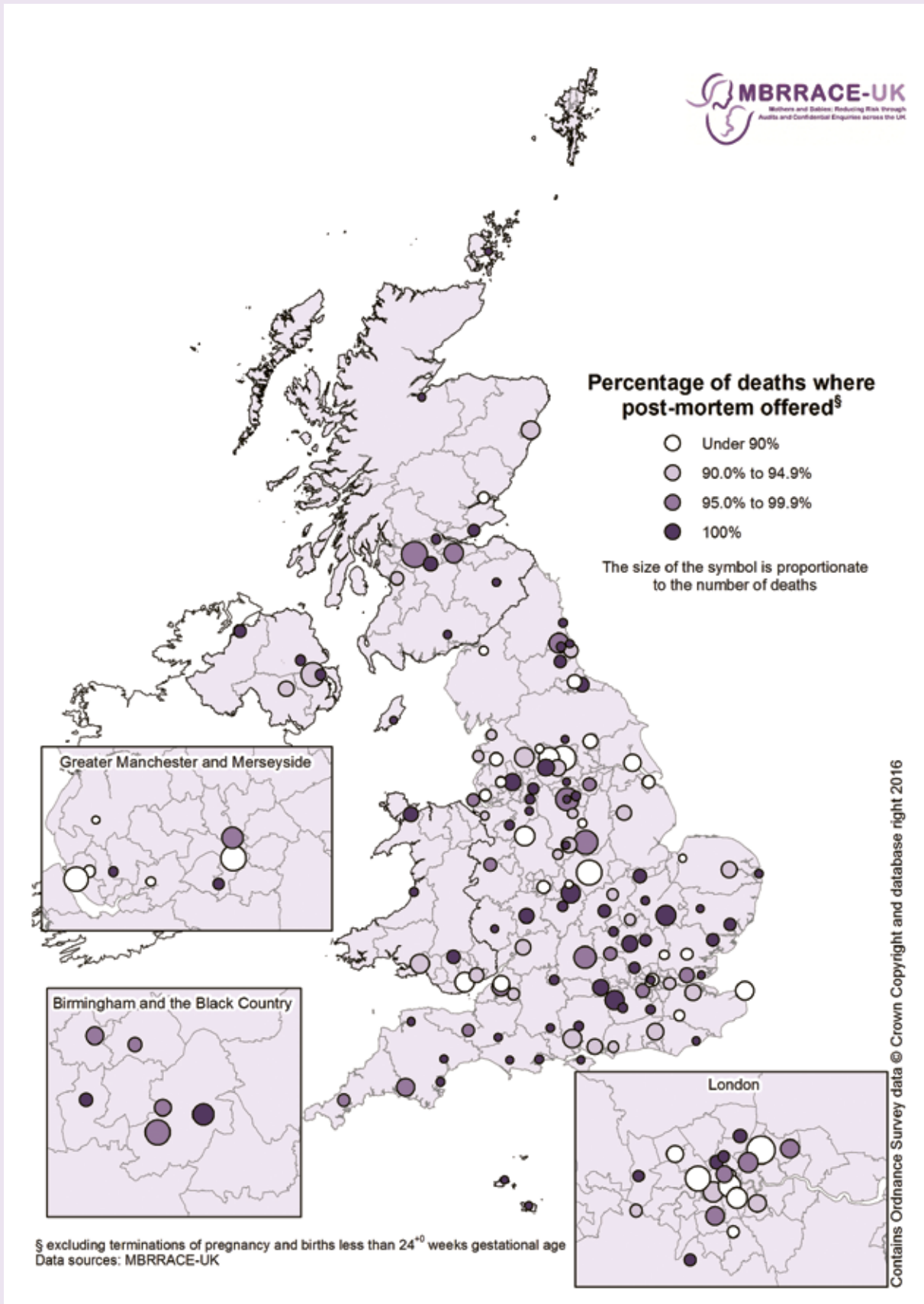
Table 18: Number of post-mortems offered and consented to by type of death (stillbirth, neonatal death, extended perinatal death): United Kingdom and Crown Dependencies, for births in 2014

Post-mortem status	Stillbirths [§]		Neonatal deaths [§]		Extended perinatal deaths [§]	
	Number	(%)	Number	(%)	Number	(%)
Not offered	50	(1.6)	137	(10.0)	187	(4.1)
Not known if offered	67	(2.1)	155	(11.3)	222	(4.8)
Offered but no consent	1503	(46.6)	628	(45.7)	2131	(46.3)
Offered but unknown consent	83	(2.6)	54	(3.9)	137	(3.0)
Offered and limited consent	120	(3.7)	28	(2.0)	148	(3.2)
Offered and full consent	1402	(43.5)	372	(27.1)	1774	(38.6)

[§] excluding terminations of pregnancy and births <24⁺⁰ weeks gestational age

Data sources: MBRRACE-UK

Figure 18: Percentage of extended perinatal deaths with offered post-mortem recorded by NHS Trust (England), Health Board (Scotland and Wales), Health and Social Care Trust (Northern Ireland), and Crown Dependency based on place of death: United Kingdom and Crown Dependencies, for births in 2014



References

1. Froen JF, Pinar H, Flenady V, Bahrin S, Charles A, Chauke L, Day K, Duke C, Facchinetti F, Fretts R, Gardener G, Gilshenan K, Gordijn S, Gordon A, Guyon G, Harrison C, Koshy R, Pattinson R, Petersson K, Russell L, Saastad E, Smith G, Torabi R. Causes of death and associated conditions (Codac) - a utilitarian approach to the classification of perinatal deaths. *BMC Pregnancy Childbirth* 2009; **9**: 22.
2. Draper ES, Kurinczuk JJ, Kenyon S, on behalf of MBRRACE-UK. *MBRRACE-UK 2015 Perinatal Confidential Enquiry: Term, singleton, normally-formed, antepartum stillbirth*. The Infant Mortality and Morbidity Studies, Department of Health Sciences, University of Leicester: Leicester, 2015.

6. Factors affecting perinatal mortality

Information concerning the main known maternal and baby risk factors for stillbirth, neonatal death, and extended perinatal mortality is reported through the MBRRACE-UK online reporting system. For risk factors where denominator data is available for all births, a crude population mortality rate is presented followed by an estimation of the size of the risk associated with the factor in the form of a ratio of mortality rates (tables 19, 20, 21 and 22 and figures 19, 20, 21, 22, 23 and 24). Some of these factors have been used in the stabilised & adjusted rates of stillbirth, neonatal mortality, and extended perinatal mortality rates presented in Chapter 3. For factors where there is no routine denominator data for all births, the prevalence of the factor in the stillbirths, neonatal deaths, and extended perinatal deaths is presented.

6.1 Mortality rates and ratios of mortality rates: mothers' characteristics

Findings from the 2014 data concerning maternal characteristics reflect those presented in the previous report. Increased rates of stillbirth, neonatal mortality, and extended perinatal mortality are seen in both the youngest (<20 years) and the oldest (>40 years) mothers and there is a direct relationship between higher deprivation (based on the mothers' postcodes at time of delivery, using the Children in Low-Income Families Local Measure [1]) and higher stillbirth and neonatal mortality rates (Table 19).

Table 19: Stillbirth, neonatal, and extended perinatal mortality rates by mother's age and socio-economic deprivation quintile of residence: United Kingdom and Crown Dependencies, for births in 2014

Mother's characteristic	Number (%) [§]						Rate per 1,000 births [§]		
	Total births		Stillbirths		Neonatal deaths		Stillbirths [†]	Neonatal deaths [‡]	Extended perinatal deaths [†]
Mother's age (years)									
<20	29,356	(3.8)	150	(4.6)	68	(4.9)	5.11	2.33	7.43
20-24	126,206	(16.1)	590	(18.1)	229	(16.5)	4.67	1.82	6.49
25-29	218,805	(28.0)	833	(25.6)	352	(25.4)	3.81	1.61	5.42
30-34	240,408	(30.7)	934	(28.7)	405	(29.3)	3.89	1.69	5.57
35-39	128,693	(16.4)	550	(16.9)	249	(18.0)	4.27	1.94	6.21
≥40	31,944	(4.1)	201	(6.2)	78	(5.6)	6.29	2.46	8.73
Not known	7,269	(0.9)	0	(0.0)	3	(0.2)	0	0.41	0.41
Socio-economic deprivation quintile*									
1- Least deprived	152,136	(19.4)	491	(15.1)	225	(16.3)	3.23	1.48	4.71
2	156,019	(19.9)	596	(18.3)	223	(16.1)	3.82	1.43	5.25
3	152,972	(19.5)	666	(20.4)	260	(18.8)	4.35	1.71	6.05
4	154,251	(19.7)	697	(21.4)	307	(22.2)	4.52	2.00	6.51
5 - Most deprived	155,106	(19.8)	771	(23.7)	349	(25.2)	4.97	2.26	7.22
Not known	12,197	(1.6)	37	(1.1)	20	(1.5)	3.03	1.64	4.67

[†] per 1,000 total births

[‡] per 1,000 live births

[§] excluding terminations of pregnancy and births <24⁺⁰ weeks gestational age

* based on mothers' postcodes at time of delivery, using the Children in Low-Income Families Local Measure

Data sources: MBRRACE-UK, NN4B, ONS, NRS, ISD, NIMATS, States of Guernsey, States of Jersey

Table 20: Ratios of mortality rates for stillbirth, neonatal death, and extended perinatal death by mother's age and socio-economic deprivation quintile of residence: United Kingdom and Crown Dependencies, for births in 2014

Mother's characteristic	Ratio of mortality rates (RR) [§]		
	Stillbirth	Neonatal death	Extended Perinatal death
Mother's age (years)			
<20	1.32 (1.11 to 1.56)	1.38 (1.06 to 1.78)	1.33 (1.16 to 1.54)
20-24	1.20 (1.09 to 1.33)	1.08 (0.92 to 1.27)	1.17 (1.07 to 1.27)
25-29	0.98 (0.89 to 1.08)	0.95 (0.83 to 1.10)	0.97 (0.90 to 1.05)
30-34	Reference	Reference	Reference
35-39	1.10 (0.99 to 1.22)	1.15 (0.98 to 1.35)	1.11 (1.02 to 1.22)
≥40	1.62 (1.39 to 1.89)	1.45 (1.14 to 1.85)	1.57 (1.38 to 1.78)
Socio-economic deprivation quintile*			
1 - Least deprived	Reference	Reference	Reference
2	1.20 (1.06 to 1.35)	0.98 (0.81 to 1.17)	1.13 (1.02 to 1.24)
3	1.35 (1.20 to 1.51)	1.14 (0.95 to 1.36)	1.28 (1.16 to 1.41)
4	1.41 (1.25 to 1.58)	1.35 (1.14 to 1.60)	1.39 (1.26 to 1.53)
5 - Most deprived	1.53 (1.37 to 1.71)	1.48 (1.25 to 1.75)	1.51 (1.38 to 1.66)

[§] excluding terminations of pregnancy and births <24⁺⁰ weeks gestational age

* based on mothers' postcodes at time of delivery, using the Children in Low-Income Families Local Measure

Data sources: MBRRACE-UK, NN4B, ONS, NRS, ISD, NIMATS, States of Guernsey, States of Jersey

For stillbirths, in comparison to the lowest quintile of deprivation, the ratio of mortality rates is significantly higher for all other quintiles of deprivation (Table 19, Figure 19 and Figure 20), whereas for neonatal deaths only the two most deprived levels of deprivation show a significantly increased mortality rate ratio. Nevertheless, for both stillbirths and neonatal deaths the ratios of mortality rates are 50% higher in the most deprived group compared to the least deprived, reflecting known evidence of a link between the highest levels of deprivation and both poorer maternal health [2] and increased risk of preterm delivery [3].

Figure 19: Ratios of mortality rates with 95% CIs for stillbirth by mother's age and socio-economic deprivation quintile of residence: United Kingdom and Crown Dependencies, for births in 2014

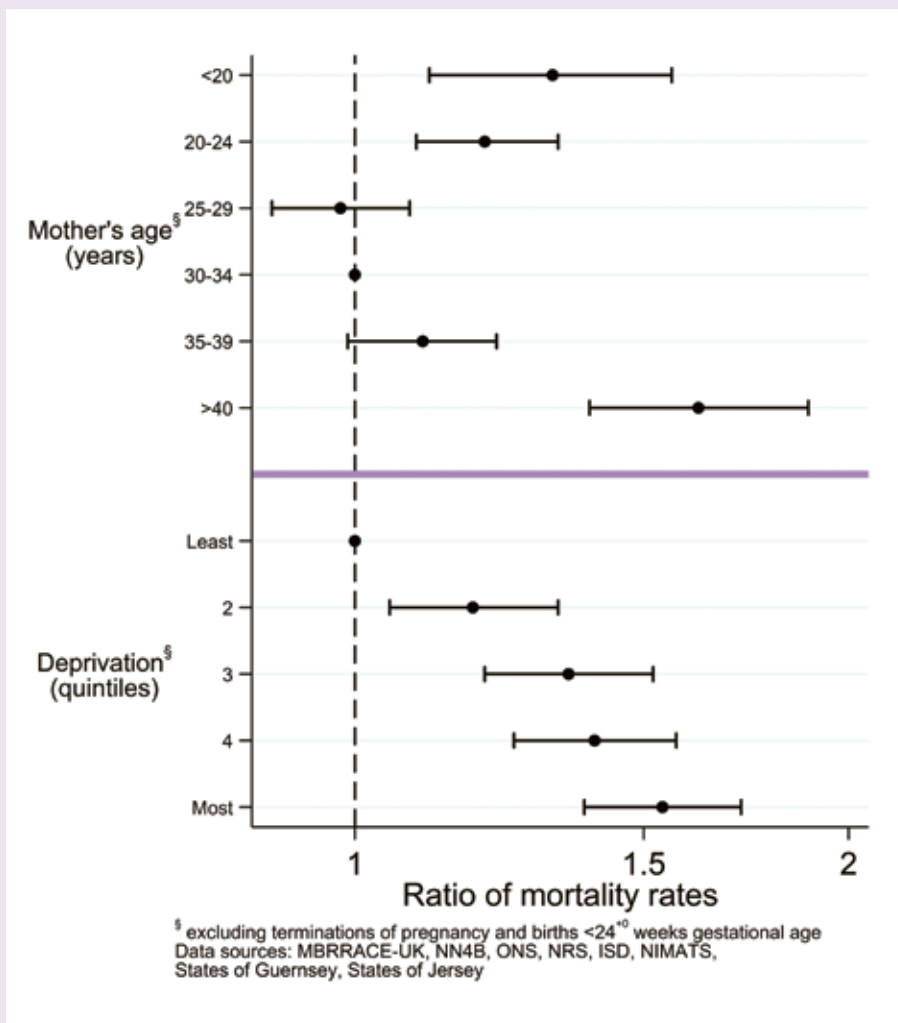
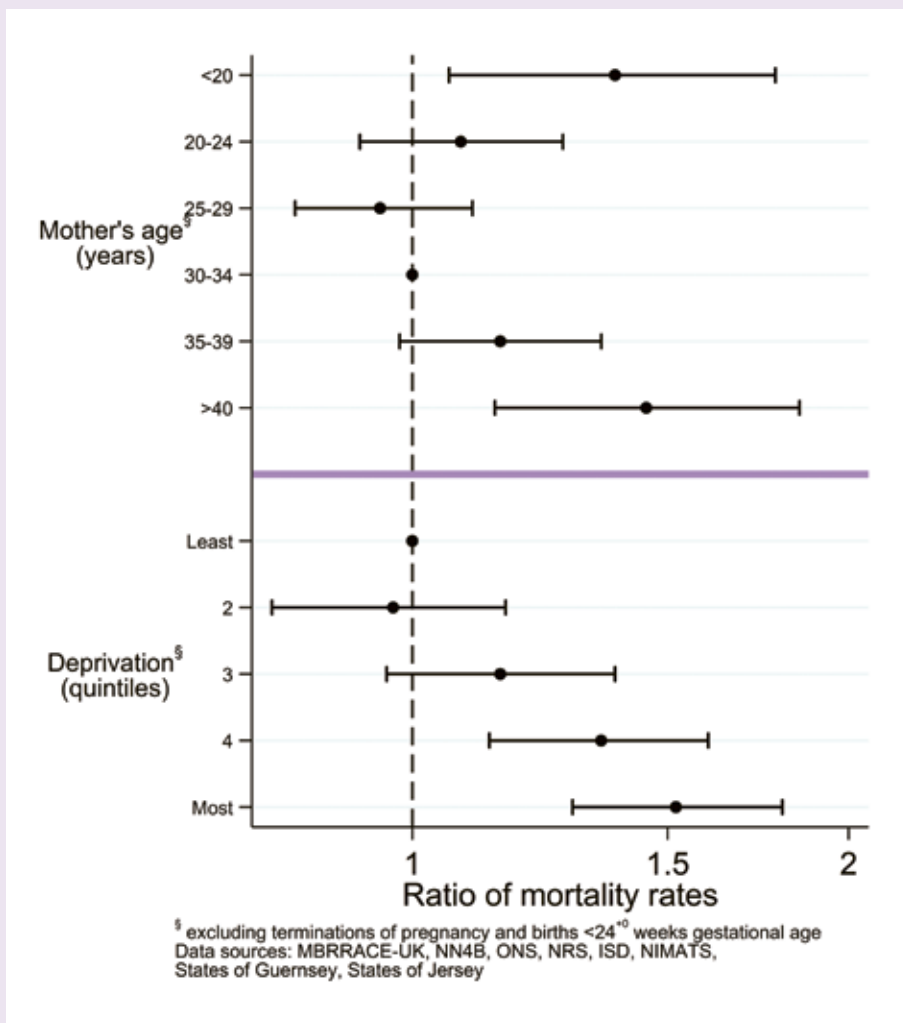


Figure 20: Ratios of mortality rates with 95% CIs for neonatal death by mother's age and socio-economic deprivation quintile of residence: United Kingdom and Crown Dependencies, for births in 2014



6.2 Mortality rates and ratios of rates: babies' characteristics

The prevalence of baby characteristics in terms of sex, multiplicity of birth, ethnicity, gestational age at birth and birthweight and their related ratios of mortality rate are presented in Table 21 and Table 22 and Figure 21 to Figure 24.

Table 21: Stillbirth, neonatal, and extended perinatal mortality rates by baby's sex, multiplicity of birth, ethnicity, gestational age, and birthweight: United Kingdom and Crown Dependencies, for births in 2014

Baby's characteristic	Number (%) [§]						Rate per 1,000 births [§]		
	Total births		Stillbirths		Neonatal deaths		Stillbirths [†]	Neonatal deaths [‡]	Extended perinatal deaths [†]
Sex									
Male	400,707	(51.2)	1,594	(48.9)	727	(52.5)	3.98	1.82	5.79
Female	381,806	(48.8)	1,562	(47.9)	623	(45.0)	4.09	1.64	5.72
Not known	168	(0.0)	102	(3.1)	34	(2.5)			
Multiplicity									
1	751,922	(96.1)	2,975	(91.3)	1,193	(86.2)	3.96	1.59	5.54
2	23,942	(3.1)	265	(8.1)	185	(13.4)	11.07	7.81	18.80
≥3	601	(0.1)	6	(0.2)	5	(0.4)	9.98	8.40	18.30
Not known	6,216	(0.8)	12	(0.4)	1	(0.1)			
Baby's ethnicity									
White	567,491	(72.5)	2,145	(65.8)	959	(69.3)	3.78	1.70	5.47
Mixed	37,926	(4.9)	154	(4.7)	53	(3.8)	4.06	1.40	5.46
Asian, Asian British	75,271	(9.6)	476	(14.6)	175	(12.6)	6.32	2.34	8.65
Black, Black British	34,037	(4.4)	255	(7.8)	82	(5.9)	7.49	2.43	9.90
Other	15,813	(2.0)	65	(2.0)	35	(2.5)	4.11	2.22	6.32
Not known	34,982	(4.5)	151	(4.6)	75	(5.4)			
Gestational age at birth (weeks)									
24 ⁺⁰ -27 ⁺⁶	3,192	(0.4)	722	(22.2)	384	(27.8)	226.19	155.47	346.49
28 ⁺⁰ -31 ⁺⁶	6,469	(0.8)	537	(16.5)	182	(13.1)	83.01	30.68	111.15
32 ⁺⁰ -36 ⁺⁶	49,385	(6.3)	802	(24.6)	305	(22.0)	16.24	6.28	22.42
37 ⁺⁰ -41 ⁺⁶	689,795	(88.1)	1,143	(35.1)	493	(35.6)	1.66	0.72	2.37
≥42 ⁺⁰	33,840	(4.3)	54	(1.7)	20	(1.5)	1.60	0.59	2.19
Birthweight (g)									
<1,500	7,997	(1.0)	1,306	(40.1)	558	(40.3)	163.31	83.4	233.09
1,500-2,499	46,010	(5.9)	754	(23.1)	298	(21.5)	16.39	6.58	22.86
2,500-3,499	395,274	(50.5)	867	(26.6)	359	(25.9)	2.19	0.91	3.10
3,500-4,499	299,669	(38.3)	270	(8.3)	137	(9.9)	0.90	0.46	1.36
≥4,500	12,462	(1.6)	18	(0.6)	8	(0.6)	1.44	0.64	2.09
Not known	21,269	(2.7)	43	(1.3)	24	(1.7)			

[†] per 1,000 total births

[‡] per 1,000 live births

[§] excluding terminations of pregnancy and births <24⁺⁰ weeks gestational age

Data sources: MBRRACE-UK, NN4B, ONS, NRS, ISD, NIMATS, States of Guernsey, States of Jersey

Table 22: Ratios of mortality rates for stillbirth, neonatal death, and extended perinatal death by baby's sex, multiplicity of birth, ethnicity, gestational age, and birthweight: United Kingdom and Crown Dependencies, for births in 2014

Baby's characteristic	Ratio of mortality rates (RR) [§]		
	Stillbirth	Neonatal death	Extended Perinatal death
Sex			
Male	0.97 (0.91 to 1.04)	1.11 (1.00 to 1.24)	1.01 (0.95 to 1.07)
Female	Reference	Reference	Reference
Multiplicity			
1	Reference	Reference	Reference
2	2.80 (2.47 to 3.17)	4.91 (4.20 to 5.73)	3.39 (3.08 to 3.74)
≥3	2.52 (1.13 to 5.62)	5.28 (2.19 to 12.7)	3.30 (1.83 to 5.97)
Baby's ethnicity			
White	Reference	Reference	Reference
Mixed	1.07 (0.91 to 1.27)	0.83 (0.63 to 1.09)	1.00 (0.87 to 1.15)
Asian, Asian British	1.67 (1.51 to 1.85)	1.38 (1.17 to 1.62)	1.58 (1.45 to 1.72)
Black, Black British	1.98 (1.74 to 2.26)	1.43 (1.14 to 1.79)	1.81 (1.62 to 2.03)
Other	1.09 (0.85 to 1.39)	1.31 (0.94 to 1.84)	1.16 (0.95 to 1.41)
Gestational age at birth (weeks)			
24 ⁺⁰ -27 ⁺⁶	136.5 (124.36 to 149.83)	218.42 (190.18 to 250.87)	146.09 (135.36 to 157.68)
28 ⁺⁰ -31 ⁺⁶	50.1 (45.21 to 55.51)	43.47 (36.46 to 51.81)	46.86 (42.93 to 51.16)
32 ⁺⁰ -36 ⁺⁶	9.8 (8.95 to 10.73)	8.85 (7.63 to 10.26)	9.45 (8.76 to 10.2)
37 ⁺⁰ -41 ⁺⁶	Reference	Reference	Reference
≥42 ⁺⁰	0.96 (0.73 to 1.27)	0.79 (0.49 to 1.27)	0.92 (0.73 to 1.16)
Birthweight (g)			
<1,500	181.26 (159 to 206.63)	182.25 (151.19 to 219.7)	171.62 (154.17 to 191.05)
1,500-2,499	18.19 (15.83 to 20.9)	14.39 (11.75 to 17.62)	16.83 (15.01 to 18.88)
2,500-3,499	2.43 (2.12 to 2.79)	1.99 (1.63 to 2.42)	2.28 (2.04 to 2.55)
3,500-4,499	Reference	Reference	Reference
≥4,500	1.60 (0.99 to 2.58)	1.40 (0.69 to 2.87)	1.54 (1.03 to 2.28)

[§] excluding terminations of pregnancy and births <24⁺⁰ weeks gestational age

Data sources: MBRRACE-UK, NN4B, ONS, NRS, ISD, NIMATS, States of Guernsey, States of Jersey

Overall, the prevalence of each factor for the deaths and the ratios of mortality rates follow expected patterns. There are, however, a number of issues of note. For stillbirths there is no excess risk of mortality for males whereas, for neonatal death, male babies show a significant excess risk of 11% compared with female babies. Although the pattern of the ratios of mortality rates for baby's ethnicity is similar for stillbirths and neonatal deaths, there is a doubling of the risk of stillbirth associated with baby's ethnicity of Black or Black British and a 67% increased risk in the Asian or Asian British group and a 40% increased risk of neonatal death in both these groups. The highest ratio of mortality rates associated with the lowest gestational age group is for neonatal deaths whereas for both stillbirths and neonatal deaths from 28 weeks gestational age the ratios of mortality rates are very similar.

Figure 21: Ratios of mortality rates with 95% CIs for stillbirth by baby's sex, ethnicity, and multiplicity of birth: United Kingdom and Crown Dependencies, for births in 2014

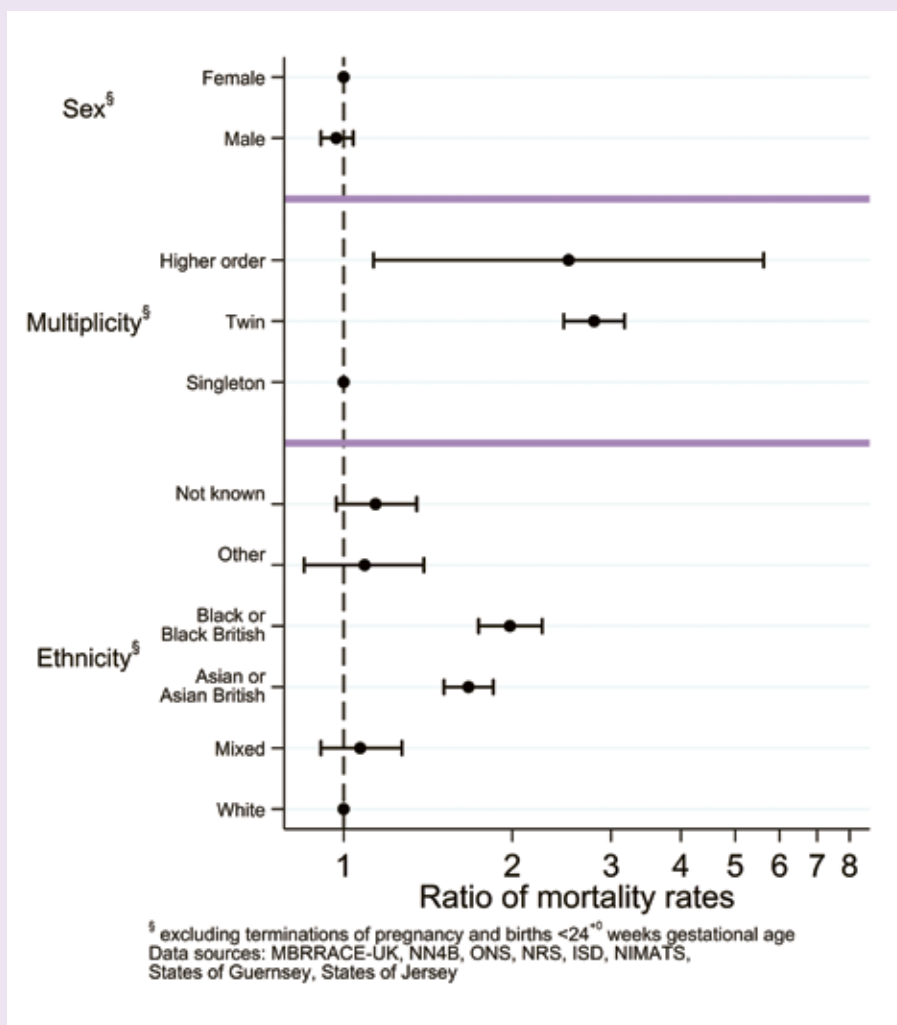


Figure 22: Ratios of mortality rates with 95% CIs for neonatal death by baby's sex, ethnicity, and multiplicity of birth: United Kingdom and Crown Dependencies, for births in 2014

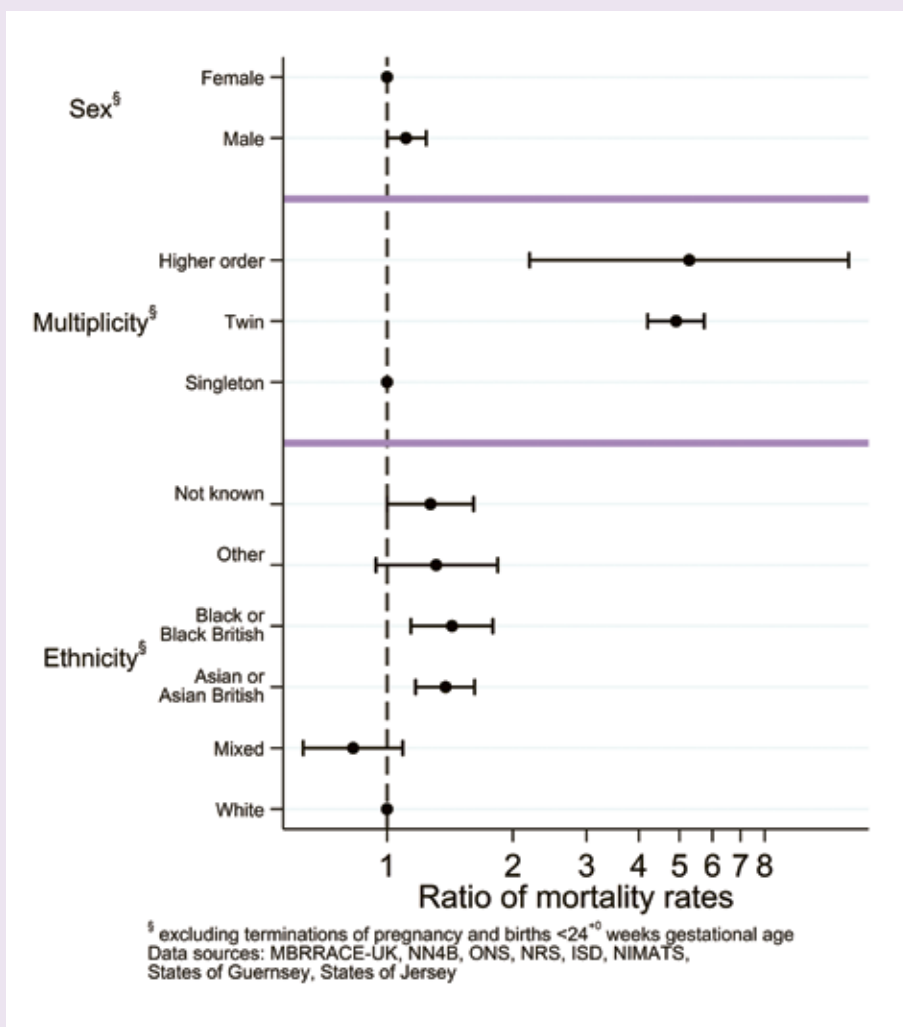


Figure 23: Ratios of mortality rates with 95% CIs for stillbirth by baby's gestational age and birthweight: United Kingdom and Crown Dependencies, for births in 2014

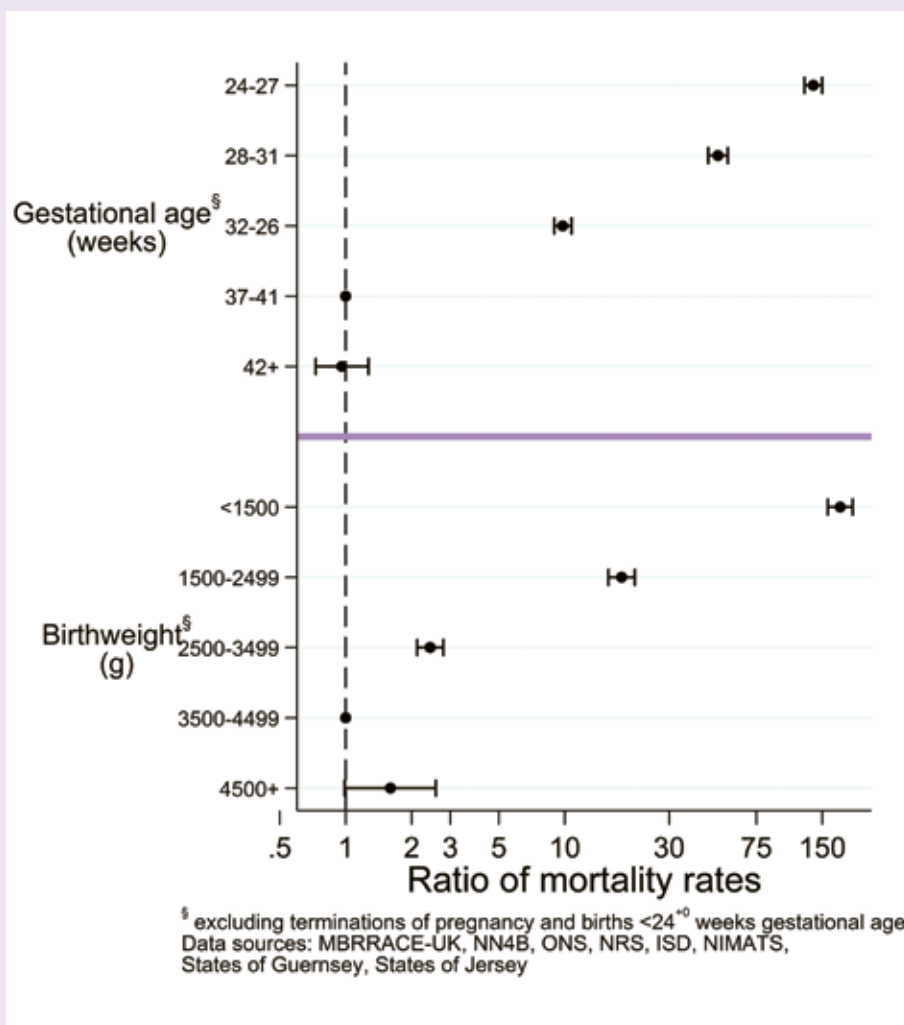
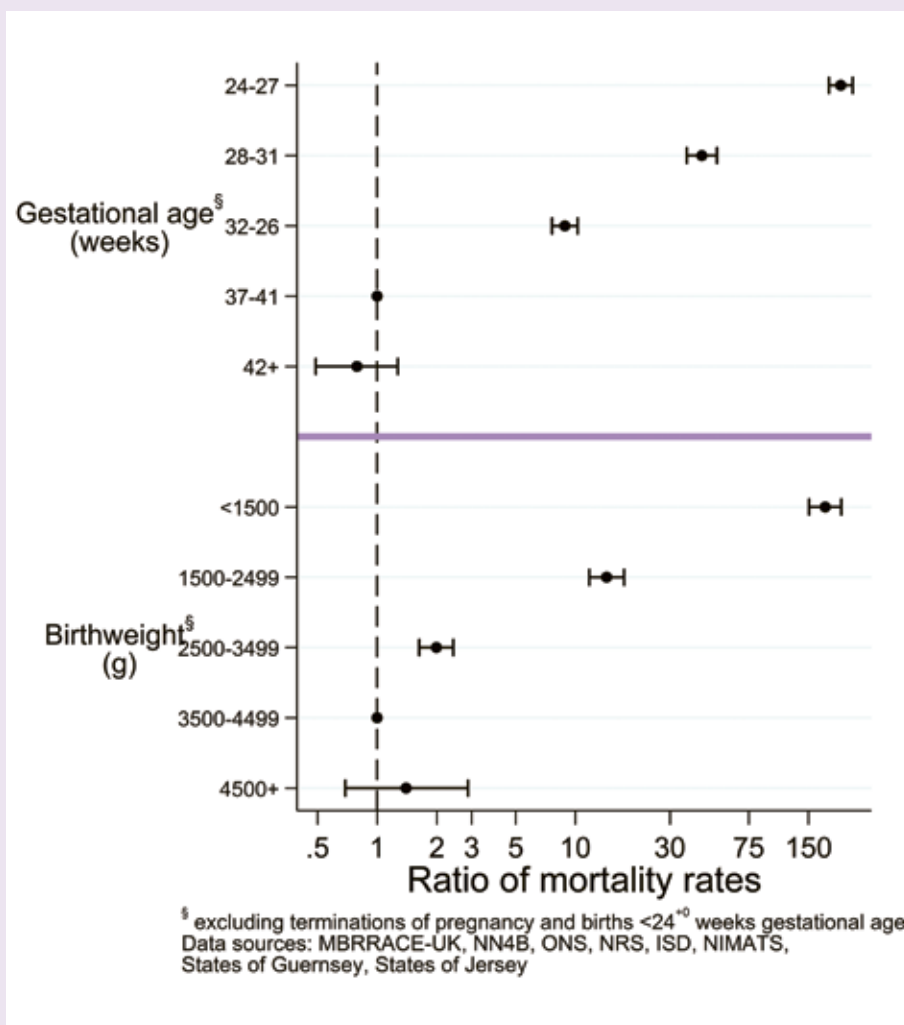


Figure 24: Ratios of mortality rates with 95% CIs for neonatal death by baby's gestational age and birthweight: United Kingdom and Crown Dependencies, for births in 2014



6.3 Mothers' demographic, behavioural and pregnancy characteristics of deaths

Data is collected for a number of the mothers' characteristics known to be associated with increased perinatal mortality but for which UK-wide denominator data is not available. In Table 23 to Table 25 the prevalence of these factors is presented for stillbirths, neonatal deaths, and extended perinatal deaths and they include demographic, behavioural and pregnancy characteristics. In the 2013 MBRRACE-UK report the completeness of this data was highlighted as an issue for both stillbirths and neonatal deaths, although the larger proportion of missing data for the neonatal deaths seemed to be due to data that is only available in the maternal notes. The MBRRACE-UK reporting system allows for the temporary assignment of cases between Trusts and Health Boards where care was provided and thus facilitates data collection from the maternal notes. It is pleasing to report that for all maternal characteristics given in Table 23 to Table 25 there has been a reduction in the percentage of stillbirths and neonatal deaths with missing data and it is hoped that there will be a year on year improvement in this aspect of data quality, allowing for future reports to explore trends in these characteristics over time. An overall summary of the data completeness for key variables can be found in Figure 25 and Table 27 (see Appendix A2.6) which provide information for the UK as a whole and for individual Trusts and Health Boards, respectively.

In addition to the reporting of smoking status for the mothers of the stillbirths, neonatal deaths and extended perinatal deaths in Table 24 the results from breath carbon monoxide testing are included in this report. These data will facilitate the evaluation of this aspect of the Stillbirth Care Bundle from NHS England [4] and other initiatives which indicate that a CO test should be provided to all pregnant women at booking to determine their smoking status. Overall this measurement was missing for nearly three quarters of the mothers of stillbirths and four fifths of the mothers of neonatal deaths.

Table 23: Number of stillbirths, neonatal deaths, and extended perinatal deaths by mothers' demographic characteristics: United Kingdom and Crown Dependencies, for births in 2014

Mothers' demographic characteristics	Stillbirths [§]		Neonatal deaths [§]		Extended perinatal deaths [§]	
	Number	(%)	Number	(%)	Number	(%)
Body Mass Index						
<16.0	6	(0.2)	4	(0.3)	10	(0.2)
16.0 to 18.4	79	(2.5)	23	(1.7)	102	(2.2)
18.5 to 24.9	1,297	(40.4)	400	(29.3)	1,697	(37.1)
25.0 to 29.9	884	(27.5)	267	(19.5)	1,151	(25.1)
30.0 to 34.9	446	(13.9)	137	(10.0)	583	(12.7)
≥35.0	333	(10.4)	102	(7.5)	435	(9.5)
Not known	165	(5.1)	433	(31.7)	598	(13.1)
Previous obstetric history^v						
Never pregnant	1,185	(36.9)	515	(37.7)	1,700	(37.2)
Stillbirth or neonatal death	165	(5.1)	63	(4.6)	228	(5.0)
Pre 24 week loss	868	(27.0)	358	(26.2)	1,226	(26.8)
Surviving child	1,579	(49.2)	678	(49.6)	2,257	(49.3)
Not known	27	(0.8)	28	(2.0)	55	(1.2)

Mothers' demographic characteristics	Stillbirths [§]		Neonatal deaths [§]		Extended perinatal deaths [§]	
	Number	(%)	Number	(%)	Number	(%)
Consanguinity						
Unrelated	2,696	(84.0)	1,047	(76.7)	3,743	(81.8)
First cousins or closer	88	(2.7)	41	(3.0)	129	(2.8)
Other relation	43	(1.3)	17	(1.2)	60	(1.3)
Not known	383	(11.9)	261	(19.1)	644	(14.1)
Born in the UK						
Yes	2,154	(67.1)	837	(61.3)	2,991	(65.4)
No	793	(24.7)	213	(15.6)	1,006	(22.0)
Not known	263	(8.2)	316	(23.1)	579	(12.6)
Time resident in the UK[~]						
Less than 1 year	79	(2.5)	15	(1.1)	94	(2.0)
More than 1 year	613	(19.1)	161	(11.8)	774	(16.9)
Not known	101	(3.2)	37	(2.7)	138	(3.0)
Support during pregnancy						
Partner, cohabiting	2,664	(83.0)	1,090	(79.8)	3,754	(82.0)
Partner, not cohabiting	192	(6.0)	79	(5.8)	271	(5.9)
Family/friend	224	(7.0)	54	(4.0)	278	(6.1)
None	26	(0.8)	7	(0.5)	33	(0.7)
Not known	104	(3.2)	136	(10.0)	240	(5.2)
Employment status						
Employed or self-employed	1,778	(55.4)	654	(47.9)	2,432	(53.2)
Unemployed (looking for work)	419	(13.1)	124	(9.1)	543	(11.9)
Student	93	(2.9)	36	(2.6)	129	(2.8)
Looking after home/family	608	(18.9)	234	(17.1)	842	(18.4)
Permanently sick/disabled	8	(0.3)	4	(0.3)	12	(0.3)
Other	26	(0.8)	14	(1.0)	40	(0.9)
Not known	278	(8.7)	299	(21.9)	577	(12.6)

[§] excluding terminations of pregnancy and births <24⁺⁰ weeks gestational age

[^] multiparous mothers can be included in more than one category

[~] women not born in the UK

Data sources: MBRRACE-UK

Table 24: Number of stillbirths, neonatal deaths, and extended perinatal deaths by mothers' behavioural characteristics: United Kingdom and Crown Dependencies, for births in 2014

Mothers' behavioural characteristics	Stillbirths [§]		Neonatal deaths [§]		Extended perinatal deaths [§]	
	Number	(%)	Number	(%)	Number	(%)
Smoking status						
Never smoked	2,029	(63.2)	798	(58.4)	2,827	(61.8)
Gave up before pregnancy	295	(9.2)	75	(5.5)	370	(8.1)
Gave up during pregnancy	130	(4.1)	36	(2.6)	166	(3.6)
Smoker	657	(20.5)	240	(17.6)	897	(19.6)
Not known	99	(3.1)	217	(15.9)	316	(6.9)
Breath carbon monoxide (ppm)						
<3	582	(18.1)	204	(14.9)	786	(17.2)
3-6	84	(2.6)	17	(1.2)	101	(2.2)
7-9	36	(1.1)	11	(0.8)	47	(1.0)
10+	108	(3.4)	28	(2.0)	136	(3.0)
Unknown	2,400	(74.8)	1,106	(81.0)	3,506	(76.6)
Alcohol consumption pre-pregnancy (weekly)						
0 units	1,871	(58.3)	618	(45.2)	2,489	(54.4)
1-2	176	(5.5)	48	(3.5)	224	(4.9)
3-5	144	(4.5)	33	(2.4)	177	(3.9)
6-14	164	(5.1)	37	(2.7)	201	(4.4)
≥15	40	(1.3)	8	(0.6)	48	(1.0)
Not known	815	(25.4)	622	(45.5)	1,437	(31.4)
Alcohol consumption at booking (weekly)						
0 units	2,464	(76.8)	801	(58.6)	3,265	(71.3)
1-2	34	(1.1)	7	(0.5)	41	(0.9)
3-5	16	(0.5)	2	(0.2)	18	(0.4)
6-14	14	(0.4)	2	(0.2)	16	(0.3)
≥15	8	(0.3)	1	(0.1)	9	(0.2)
Not known	674	(21.0)	553	(40.5)	1,227	(26.8)
Substance abuse						
No	3,039	(94.7)	1,166	(85.4)	4,205	(91.9)
Yes	91	(2.8)	30	(2.2)	121	(2.6)
Not known	80	(2.5)	170	(12.4)	250	(5.5)

[§] excluding terminations of pregnancy and births <24⁺ weeks gestational age

Data sources: MBRRACE-UK

Table 25: Number of stillbirths, neonatal deaths, and extended perinatal deaths by mothers' pregnancy characteristics: United Kingdom and Crown Dependencies, for births in 2014

Mothers' pregnancy characteristics	Stillbirths [§]		Neonatal deaths [§]		Extended perinatal deaths [§]	
	Number	(%)	Number	(%)	Number	(%)
Booking (weeks gestational age)						
Less than 12 ⁺⁰	2,194	(68.3)	678	(49.6)	2,872	(62.8)
12 ⁺⁰ to 17 ⁺⁶	597	(18.6)	204	(14.9)	801	(17.5)
18 ⁺⁰	236	(7.3)	69	(5.1)	305	(6.7)
Not known	183	(5.7)	415	(30.4)	598	(13.1)
Documented poor antenatal care attender						
No	2,936	(91.5)	1,037	(75.9)	3,973	(86.8)
Yes	104	(3.2)	26	(1.9)	130	(2.8)
Not known	170	(5.3)	303	(22.2)	473	(10.3)
Assisted conception						
Not assisted	2,980	(92.8)	1,059	(77.5)	4,039	(88.3)
Ovulation induction only	20	(0.6)	5	(0.4)	25	(0.6)
In vitro fertilisation (IVF) [°]	112	(3.5)	60	(4.4)	172	(3.8)
Artificial insemination [□]	13	(0.4)	3	(0.2)	16	(0.3)
Not known	85	(2.7)	239	(17.5)	324	(7.1)

[§] excluding terminations of pregnancy and births <24⁺⁰ weeks gestational age

[°] including egg donation and intra-cytoplasmic sperm injection

[□] with or without ovulation induction

Data sources: MBRRACE-UK

References

1. H M Revenue and Customs. Personal tax credits: related statistics - Children in Low-Income Families Local Measure. Available online at: <https://www.gov.uk/government/statistics/personal-tax-credits-children-in-low-income-families-local-measure>. H M Government: 2014.
2. Oakley L, Maconochie N, Doyle P, Dattani N, Moser K. Multivariate analysis of infant death in England and Wales in 2005-06, with focus on socio-economic status and deprivation. *Health statistics quarterly / Office for National Statistics* 2009; 42: 22-39.
3. Smith LK, Draper ES, Manktelow BN, Dorling JS, Field DJ. Socioeconomic inequalities in very preterm birth rates. *Archives of Disease in Childhood Fetal & Neonatal Edition* 2007; 92: F11-F14.
4. NHS England. National Maternity Review. Available online at: <https://www.england.nhs.uk/tag/maternity-review/>. NHS England: 2016.

Appendices

A1. Perinatal mortality in the UK from routine sources

Data presented in Table 26, shows the statutory registered stillbirth, neonatal death and extended perinatal death rates in the UK for 2004-2014.

Table 26: Stillbirth, neonatal, and extended perinatal mortality rates from statutory registrations by country: United Kingdom, 2004 to 2014

Rate per 1,000 births	Country	Year of death										
		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Stillbirths †	UK	5.50	5.32	5.30	5.19	5.08	5.19	5.07	5.17	4.82	4.60	4.53
	England	5.47	5.35	5.35	5.18	5.07	5.17	5.08	5.23	4.81	4.65	4.59
	Scotland	5.84	5.34	5.29	5.63	5.38	5.34	4.93	5.08	4.70	4.16	4.00
	Wales	5.51	5.34	5.09	4.94	4.61	5.13	5.26	4.67	5.11	4.51	5.25
	Northern Ireland	5.04	3.97	3.81	4.15	4.47	4.75	4.13	3.59	4.18	4.51	3.31
Neonatal deaths ‡	UK	3.43	3.50	3.46	3.26	3.18	3.12	2.96	2.95	2.78	2.66	2.70
	England	3.45	3.45	3.49	3.24	3.18	3.10	2.93	2.94	2.78	2.67	2.69
	Scotland	3.08	3.49	3.09	3.25	2.80	2.79	2.55	2.71	2.55	2.34	2.42
	Wales	3.09	2.88	2.68	3.31	2.95	3.09	2.73	2.75	2.75	2.43	2.38
	Northern Ireland	3.72	4.97	3.87	3.31	3.71	3.89	4.58	3.48	2.77	3.38	3.94
Extended perinatal deaths †	UK	8.92	8.80	8.74	8.43	8.24	8.30	8.01	8.11	7.59	7.25	7.22
	England	8.90	8.79	8.82	8.40	8.24	8.25	8.00	8.16	7.58	7.31	7.26
	Scotland	8.90	8.82	8.36	8.86	8.17	8.12	7.46	7.78	7.24	6.49	6.41
	Wales	8.58	8.21	7.75	8.24	7.54	8.2	7.97	7.41	7.85	6.93	7.62
	Northern Ireland	8.74	8.92	7.66	7.45	8.16	8.63	8.69	7.06	6.94	7.87	7.23

† per 1,000 total births

‡ per 1,000 live births

Data sources: ONS, NRS, NISRA

Note: Mortality rates for 2013 for England and Wales have been updated to reflect updated information from ONS [1-3].

The neonatal and extended perinatal mortality rates for Wales and Northern Ireland were transposed in the MBRRACE-UK report for 2013 births published June 2015: corrections have been made and included in Table 26, above.

Differences in the law in Northern Ireland relating to the termination of pregnancy means that a greater proportion of babies with severe congenital anomalies are carried to term, but then die after birth. This may well be responsible for the relatively high rate of neonatal death for Northern Ireland.

References

- Office for National Statistics. 2013 Death Registrations Summary Tables, England and Wales. Available online at: <http://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datasets/deathregistrationssummarytablesenglandandwalesreferencetables>. ONS: 2014.
- Office for National Statistics. 2013 Birth Summary Tables, England and Wales. Available online at: <http://www.ons.gov.uk/ons/rel/vsob1/birth-summary-tables--england-and-wales/2013/index.html>. ONS: 2014.
- Office for National Statistics. 2013 Childhood, Infant and Perinatal Mortality in England and Wales. Available online at: <http://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datasets/childmortalitystatisticschildhoodinfantandperinatalchildhoodinfantandperinatalmortalityinenglandandwales>. ONS: 2015.

A2. Further details of the MBRRACE–UK data collection

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Louise Wheeler	Maternity Risk Manager	Kingston Hospital NHS Trust
Sandeep Dharmaraj	Consultant Neonatologist – Royal Preston Hospital	Lancashire Teaching Hospitals NHS Foundation Trust
Ruth Kirby	Specialist Bereavement Midwife/Counsellor – Royal Preston Hospital	Lancashire Teaching Hospitals NHS Foundation Trust
Rosanne Gunn–Russell	Specialist Midwife, Bereavement	Lewisham and Greenwich NHS trust
Emma Kenny	Clinical Governance Manager – Queen Elizabeth Hospital	Lewisham and Greenwich NHS trust
Jauro Kuna	Clinical Director for Neonatal Services – University Hospital Lewisham	Lewisham and Greenwich NHS trust
Sue Percival	Specialist Midwife, Fetal Medicine – University Hospital Lewisham	Lewisham and Greenwich NHS trust
Teresa Stimson	Sister Neonatal Unit – Queen Elizabeth Hospital	Lewisham and Greenwich NHS trust
Samantha Thomas	Bereavement Midwife	Lewisham and Greenwich NHS trust
Michelle Wells–Braithwaite	Patient Safety Manager	Lewisham and Greenwich NHS trust
Joanne Brady	Neonatal Nurse for IT Systems	Liverpool Women's NHS Foundation Trust
Devender Roberts	Consultant in Obstetrics and Fetal Medicine	Liverpool Women's NHS Foundation Trust
Alison Whitters	Neonatal Nurse for IT Systems	Liverpool Women's NHS Foundation Trust
Jane Saltmarsh	IT Nurse Specialist	Liverpool Women's NHS Foundation Trust
Jennifer Robinson	Midwife – Liverpool Women's Hospital	Liverpool Women's NHS Foundation Trust

Meena Down	Maternity Clinical Risk Manager	London North West Healthcare NHS Trust
Joanne Dunckley	Labour Ward Manager – Ealing	London North West Healthcare NHS Trust
Richard Nicholl	Consultant Neonatal Paediatrician – Northwick Park Hospital	London North West Healthcare NHS Trust
Christine Pace	Clinical Audit and Effectiveness Team – Northwick Park Hospital	London North West Healthcare NHS Trust
Hiran Samarage	Consultant Obstetrician and Gynaecologist/Head, Fetal Medicine Unit – Northwick Park Hospital	London North West Healthcare NHS Trust
Marva Wilson	Bereavement Midwife – Northwick Park Hospital	London North West Healthcare NHS Trust
Catherine Hudson	Audit Lead Midwife – Luton and Dunstable Hospital	Luton and Dunstable Hospital NHS Foundation Trust
Elizabeth Langham	Neonatal Lead Nurse – Luton and Dunstable Hospital	Luton and Dunstable Hospital NHS Foundation Trust
Anne–Marie Mead	Neonatal Nurse – Luton and Dunstable Hospital	Luton and Dunstable Hospital NHS Foundation Trust
Julie Coppin	Maternity Risk Manager/Supervisor of Midwives – Tunbridge Wells Hospital	Maidstone and Tunbridge Wells NHS Trust
Jackie Tyler	Paediatric Matron	Maidstone and Tunbridge Wells NHS Trust
Sarah Jones	Advanced Neonatal Nurse Practitioner – Medway Maritime Hospital	Medway NHS Foundation Trust
Helen McElroy	Consultant Neonatologist – Medway Maritime Hospital	Medway NHS Foundation Trust
Yvonne Morrison	Bereavement Midwife – Medway Maritime Hospital	Medway NHS Foundation Trust
Julie Spencer	Lead Midwife Delivery Suite – Medway Maritime Hospital	Medway NHS Foundation Trust
Tracy Sellors	Senior Clinical Audit Facilitator – Leighton Hospital	Mid Cheshire Hospitals NHS Foundation Trust
Alison Cuthbertson	Head of Midwifery – Broomfield Hospital	Mid Essex Hospital Services NHS Trust
Indranil Misra	Consultant Paediatrician – Milton Keynes Hospital	Milton Keynes Hospital NHS Foundation Trust
Tracy Rea	Bereavement Midwife and Supervisor of Midwives – Milton Keynes Hospital	Milton Keynes Hospital NHS Foundation Trust
Sheena Kinmond	Consultant Paediatrician – Crosshouse Hospital	NHS Ayrshire and Arran
Inass Osman	Consultant Obstetrics and Gynaecology – Ayrshire Maternity Unit	NHS Ayrshire and Arran
Jane Ramsay	Clinical Director Obstetrics – Ayrshire Maternity Hospital	NHS Ayrshire and Arran
Nicky Berry	Associate Nurse Director/Head of Midwifery and General Manager for Women and Children’s Services	NHS Borders
Andrew Duncan	Consultant Paediatrician – Borders General Hospital	NHS Borders
Brian Magowan	Consultant in Obstetrics and Gynaecology and Head of Service – Borders General Hospital	NHS Borders
Heather Armstrong	Associate Specialist, Paediatrician – Dumfries and Galloway Royal Infirmary	NHS Dumfries and Galloway
Stephen Wisdom	Consultant Obstetrician – Dumfries and Galloway Royal Infirmary	NHS Dumfries and Galloway
Sean Ainsworth	Consultant Neonatologist – Victoria Hospital	NHS Fife
Annette Lobo	Consultant Midwife/Supervisor of Midwives – Victoria Hospital	NHS Fife
Gail Bell	Deputy Head of Midwifery/Senior Midwife – Forth Valley Royal Hospital	NHS Forth Valley
Lynette Mackenzie	Department Manager, Paediatrics and Neonates – Forth Valley Royal Hospital	NHS Forth Valley
Gillian McMillan	Clinical Coordinator – Forth Valley Royal Hospital	NHS Forth Valley
Lena Crichton	Consultant Obstetrician – Aberdeen Maternity Hospital, also reports Aberdeen Royal Infirmary, Shetland and Orkney	NHS Grampian
Sarah Dallas	Consultant Locum	NHS Grampian
Neil Maclean	Consultant Obstetrician and Gynaecologist – Doctor Gray’s Hospital	NHS Grampian
Mike Munro	Consultant Neonatologist – Aberdeen Maternity Hospital	NHS Grampian

Slawomir Wojcik	Consultant – Doctor Gray's Hospital	NHS Grampian
Janice Gibson	Consultant, Obstetrics – Southern General Hospital	NHS Greater Glasgow and Clyde
Allan Jackson	Consultant Neonatologist – Princess Royal Maternity Hospital	NHS Greater Glasgow and Clyde
Malini Kanagalingam	Consultant Locum, Obstetrics and Gynaecology	NHS Greater Glasgow and Clyde
Dawn Kernaghan	Consultant Obstetrician – The Princess Royal Maternity Hospital	NHS Greater Glasgow and Clyde
Kathleen O'Reilly	Consultant Neonatologist – Southern General Hospital and Royal Hospital for Sick Children (Yorkhill)	NHS Greater Glasgow and Clyde
Philine Van Der Heide	Consultant Paediatrician – Raigmore Hospital	NHS Highland
Samuel Ibhanebor	Consultant Neonatologist – Wishaw General Hospital	NHS Lanarkshire
Dina McLellan	Consultant Obstetrician – Wishaw General Hospital	NHS Lanarkshire
Mary Moffat	Management Secondment Maternity – Wishaw General Hospital	NHS Lanarkshire
Geraldine Morgan	Maternity Management Secondment – Wishaw General Hospital	NHS Lanarkshire
Sarah Court	Specialist Registrar. – St Johns Livingston	NHS Lothian
Ewen Johnston	Consultant Neonatologist – Edinburgh Royal Infirmary	NHS Lothian
Frances McGuire	Clinical Manager – St Johns Livingston	NHS Lothian
Sangeetha Nagabushanam	Senior Registrar, Obstetrics and Gynaecology – Edinburgh Royal Infirmary	NHS Lothian
Nithiya Palaniappan	Consultant Obstetrician – Royal Infirmary Edinburgh	NHS Lothian
Vanitha Sivalingam	Specialist Registrar, Obstetrics and Gynaecology	NHS Lothian
Holger Unger	Specialist Registrar, Obstetrics and Gynaecology	NHS Lothian
Peter Oduro	Consultant Obstetrician	NHS Orkney
Kate Kenmure	Consultant Midwife/Child Health Manager – Gilbert Bain Hospital	NHS Shetland
Elaine McCover	Senior Charge Midwife – Gilbert Bain Hospital	NHS Shetland
Pauline Lynch	Clinical Lead for Labour Suite – Ninewells Hospital	NHS Tayside
Roselyn Mudenha	Consultant Obstetrician and Gynaecologist – Ninewells Hospital Dundee	NHS Tayside
Jennifer Scotland	Consultant Neonatologist – Ninewells Hospital	NHS Tayside
Catherine Macdonald	Head of Midwifery – Western Isles Hospital	NHS Western Isles
Claudia Rettberg	Consultant Paediatrician – Western Isles Hospital	NHS Western Isles
Mark Dyke	Consultant Neonatologist – Norfolk and Norwich University Hospital	Norfolk and Norwich University Hospitals NHS Foundation Trust
Jill Tinsey	IT Midwife – Norfolk and Norwich University Hospital	Norfolk and Norwich University Hospitals NHS Foundation Trust
Jacqui Lewis	Band 7 Midwife – Southmead Hospital	North Bristol NHS Trust
Paul Mannix	Consultant Neonatologist – Southmead Hospital	North Bristol NHS Trust
Bernadette Bowness	Bereavement Specialist Midwife – West Cumberland Hospital	North Cumbria University Hospitals NHS Trust
Debbie Bryan	Ward Manager, Neonatal Unit – University Hospital of North Tees	North Tees and Hartlepool NHS Foundation Trust
Andrea Ewing	Pregnancy Loss Midwife – Cumberland Infirmary	North Cumbria University Hospitals NHS Trust
Glyn Jones	Consultant Paediatrician – Cumberland Infirmary	North Cumbria University Hospitals NHS Trust
Michelle Lynch	Bereavement Midwife – Maternity	North Middlesex University Hospital NHS Trust
Alison (aka 'Morag') Oldfield	Governance Midwife – North Middlesex University Hospital	North Middlesex University Hospital NHS Trust
Chidambara Harikumar	Consultant Paediatrician – North Tees University Hospital	North Tees and Hartlepool NHS Foundation Trust

Stephanie El-Malak	Delivery Suite Manager	North Tees and Hartlepool NHS Foundation Trust
Iona MacLeod	Consultant Obstetrician	North Tees and Hartlepool NHS Foundation Trust
Jane Malcolm	Ward Manager, Neonatal Unit – University Hospital of North Tees	North Tees and Hartlepool NHS Foundation Trust
Rebecca Taylor	Senior Staff Nurse	North Tees and Hartlepool NHS Foundation Trust
Rachael Moss	Pre Natal Diagnosis Midwife – Northampton General Hospital	Northampton General Hospital NHS Trust
Rachel Perry	Bereavement Midwife	Northampton General Hospital NHS Trust
Carolyn Hide	Labour Ward Coordinator – North Devon District Hospital	Northern Devon Healthcare NHS Trust
Elizabeth Mills	Lead Nurse for Paediatrics/Neonatal Services – North Devon District Hospital	Northern Devon Healthcare NHS Trust
Michael Selter	Consultant Paediatrician/Neonatal Services – North Devon District Hospital	Northern Devon Healthcare NHS Trust
Pauline Adiotomre	Consultant Paediatrician – Diana Princess of Wales Hospital	Northern Lincolnshire and Goole Hospitals NHS Foundation Trust
Dianne Bradley	Senior Staff Midwife – Diana Princess of Wales Hospital	Northern Lincolnshire and Goole Hospitals NHS Foundation Trust
Gill Ibbotson	Coordinator, Central Delivery Suite – Scunthorpe General Hospital	Northern Lincolnshire and Goole Hospitals NHS Foundation Trust
Lisa Pennington	Clinical Audit Officer – Scunthorpe General Hospital	Northern Lincolnshire and Goole Hospitals NHS Foundation Trust
Vivienne Brady	Governance Lead for Obstetrics and Gynaecology – Wansbeck Maternity Unit	Northumbria Healthcare NHS Foundation Trust
Malini Shivanath	Consultant Obstetrician and Gynaecologist	Northumbria Healthcare NHS Foundation Trust
Amy Brears	Neonatal Bereavement Support Facilitator – Nottingham City Hospital	Nottingham University Hospitals NHS Trust
Louise Crabtree	Advanced Neonatal Nurse Practitioner – Nottingham City Hospital	Nottingham University Hospitals NHS Trust
Mandy Dann	Bereavement Midwife	Nottingham University Hospitals NHS Trust
Heather McEwen	Bereavement Care Link Midwife	Nottingham University Hospitals NHS Trust
Joy Moran	Lead Nurse Child Death Review Team – Queen's Medical Centre	Nottingham University Hospitals NHS Trust
Jane Pidgeon	Maternity Governance Team Midwife/Supervisor of Midwives	Nottingham University Hospitals NHS Trust
Catherine Bartlett	Midwife – John Radcliffe Hospital and Horton Maternity Hospital	Oxford University Hospitals NHS Trust
Seif Babiker	Consultant Paediatrician – Peterborough City Hospital	Peterborough and Stamford Hospitals NHS Foundation Trust
Lesley Carline	Bereavement Specialist Midwife – Peterborough City Hospital	Peterborough and Stamford Hospitals NHS Foundation Trust
Shirley Steel	Consultant Obstetrician and Gynaecologist – Peterborough City Hospital	Peterborough and Stamford Hospitals NHS Foundation Trust
Mo Cleland	Bereavement Midwife	Plymouth Hospitals NHS Trust
Nicola Maxwell	Consultant Neonatologist – Derriford Hospital	Plymouth Hospitals NHS Trust
Sue Stock	Head of Midwifery/Associate Director of Nursing – Derriford Hospital	Plymouth Hospitals NHS Trust
Jill Chatten	Acting Risk Manager – Poole Hospital	Poole Hospital NHS Foundation Trust
Peter McEwan	Consultant Neonatologist – Poole Hospital	Poole Hospital NHS Foundation Trust
Alison McGuinness	Bereavement Support Midwife – St Mary's Maternity Unit, Poole Hospital	Poole Hospital NHS Foundation Trust
Daniel Webster	Consultant Obstetric Lead for Risk – Poole Hospital	Poole Hospital NHS Foundation Trust
Charlotte Groves	Consultant Neonatologist – Queen Alexandra Hospital	Portsmouth Hospitals NHS Trust
Sharon Hackett	Senior Midwifery Manager Clinical Governance – Queen Alexandra Hospital	Portsmouth Hospitals NHS Trust

Tracey Lasisi	Midwifery Sister – Queen Alexandra Hospital	Portsmouth Hospitals NHS Trust
Cate Langley	Head of Midwifery – Powys	Powys Teaching Health Board
Donna Owen	Lead Midwife (Risk)	Powys Teaching Health Board
Kate Flack	Bereavement Midwife – Royal Berkshire Hospital	Royal Berkshire NHS Foundation Trust
Val Hedley	Sister Paediatric Intensive Care Unit – Royal Brompton Hospital	Royal Brompton and Harefield NHS Foundation Trust
Paul Munyard	Consultant Paediatrician – Royal Cornwall Hospital	Royal Cornwall Hospitals NHS Trust
Karen Stoyles	Antenatal Ward Manager/Bereavement Midwife – Royal Cornwall Hospital	Royal Cornwall Hospitals NHS Trust
Deborah Smith–Ringer	Perinatal and Child Death Coordinator – Royal Devon and Exeter Hospital	Royal Devon and Exeter NHS Foundation Trust
Helen Bolarinwa	Senior Midwife/Labour Ward Coordinator – Royal Free Hospital	Royal Free London NHS Foundation Trust
Monica Delolmo	Bereavement Midwife	Royal Free London NHS Foundation Trust
Lindsay Frank	Advanced Neonatal Nurse Practitioner – Royal Free Hospital	Royal Free London NHS Foundation Trust
Alina Lau	Bereavement Midwife – Royal Free Hospital	Royal Free London NHS Foundation Trust
Seeking Lee	Ward Lead – Starlight Neonatal Intensive Care Unit Barnet Hospital	Royal Free London NHS Foundation Trust
Michele Ramos–Gonzalez	Women’s and Children’s Clinical Governance and Risk Manager Supervisor of Midwives	Royal Free London NHS Foundation Trust
Miranda Ryan	Staff Nurse – Barnet Hospital	Royal Free London NHS Foundation Trust
Meg Wilkinson	Labour Ward Matron – Royal Free Hospital	Royal Free London NHS Foundation Trust
Sheryl Roy	Bereavement Midwife – Royal Surrey County Hospital	Royal Surrey County Hospital NHS Foundation Trust
Claire Worthington	Clinical Governance Midwife	Royal Surrey County Hospital NHS Foundation Trust
Stephen W Jones	Consultant Paediatrician – Royal United Hospital	Royal United Hospital Bath NHS Trust
Annette Moreton	Patient Safety Midwife – Royal United Hospital	Royal United Hospital Bath NHS Trust
Clare Baggot	Midwife – Salisbury Hospital	Salisbury NHS Foundation Trust
Louise Jones	Risk Manager – Salisbury District Hospital	Salisbury NHS Foundation Trust
Philippa Ridley	Paediatric Consultant – Salisbury Hospital	Salisbury NHS Foundation Trust
Clare Smith	Midwife	Salisbury NHS Foundation Trust
Lindsay Halpern	Neonatal Consultant – Birmingham City Hospital	Sandwell and West Birmingham Hospitals NHS Trust
Mary Molloy	Bereavement Midwife – City Hospital	Sandwell and West Birmingham Hospitals NHS Trust
Nicola Robinson	Risk and Governance Lead Maternity and Neonates – City Hospital	Sandwell and West Birmingham Hospitals NHS Trust
Neil Shah	Consultant – City Hospital	Sandwell and West Birmingham Hospitals NHS Trust
Lilias Alison	Consultant Paediatrician – Sheffield Children’s Hospital	Sheffield Children’s NHS Foundation Trust
Anton Mayer	Consultant in Paediatric Intensive Care	Sheffield Children’s NHS Foundation Trust
Simon Clark	Consultant Neonatologist – Jessop Wing	Sheffield Teaching Hospitals NHS Foundation Trust
Eleanor Clewes	Clinical Audit Midwife – The Jessop Wing	Sheffield Teaching Hospitals NHS Foundation Trust
Kate Draper	Clinical Lead Neonatal Unit – King’s Mill Hospital	Sherwood Forest Hospitals NHS Foundation Trust
Flo McGrattan	Delivery Suite Coordinator	South Devon Healthcare NHS Foundation Trust
Vedrana Caric	Consultant in Fetal Medicine	South Tees Hospitals NHS Foundation Trust
Shalabh Garg	Consultant Neonatologist – James Cook University Hospital	South Tees Hospitals NHS Foundation Trust
Caroline Marshall	Research/Audit Coordinator	South Tees Hospitals NHS Foundation Trust
Alison Russell	Central Delivery Suite Manager – James Cook University Hospital and The Friarage Hospital	South Tees Hospitals NHS Foundation Trust

Umo Esen	Consultant Obstetrics and Gynaecology – South Tyneside District Hospital	South Tyneside NHS Foundation Trust
Yvonne Hood	Bereavement Midwife	South Warwickshire NHS Foundation Trust
Wendy Jones	Head of Midwifery	South Warwickshire NHS Foundation Trust
Laura Mossman	Clinical Risk Manager for Obstetrics and Gynaecology – Southend University Hospital	Southend University Hospital NHS Foundation Trust
Karen Waring	Neonatal Unit Manager – Ormskirk	Southport and Ormskirk Hospital NHS Trust
Nasreen Aziz	Consultant Neonatologist – St George's Hospital	St George's University Hospitals NHS Foundation Trust
Sijo Francis	Consultant Neonatologist – St George's	St George's University Hospitals NHS Foundation Trust
Margaret Flynn	Senior Midwife – Risk	St George's University Hospitals NHS Foundation Trust
Melanie O'Byrne	Bereavement Specialist Midwife – St George's Hospital	St George's University Hospitals NHS Foundation Trust
Justin Richards	Consultant Neonatologist – St George's	St George's University Hospitals NHS Foundation Trust
Julian Sutton	Lead Midwife for Clinical Governance – St George's Hospital	St George's University Hospitals NHS Foundation Trust
Caroline Deveney	Ward Manager Special Care Baby Unit – Whiston Hospital	St Helens and Knowsley Teaching Hospitals NHS Trust
Mary Hornby	Interim Delivery Suite Manager/Coordinator	St Helens and Knowsley Teaching Hospitals NHS Trust
Katherine Hughes	Bereavement Midwife	St Helens and Knowsley Teaching Hospitals NHS Trust
Jacqui Kourellias	Interim Matron, Maternity and Gynaecology – Whiston Hospital	St Helens and Knowsley Teaching Hospitals NHS Trust
Lisa Stephens	Risk Management Midwife – Princess Elizabeth Hospital	States of Guernsey Health and Social Services
Dawn Watterson	Midwifery Clinical Lead – Risk	States of Guernsey Health and Social Services
Julie Mycock	Lead Midwife – General Hospital	States of Jersey Health and Social Services
Carole Beales	Bereavement Midwife – Stepping Hill Hospital	Stockport NHS Foundation Trust
Marie Dooley	Governance and Quality Manager/Supervisor of Midwives – Stepping Hill Hospital	Stockport NHS Foundation Trust
Julie Estcourt	Head of Midwifery/Nursing – Stepping Hill Hospital	Stockport NHS Foundation Trust
Mavis Bloomfield	Midwife	Surrey and Sussex Healthcare NHS Trust
K Abdul Khader	Consultant Paediatrician and Neonatal Lead – East Surrey Hospital	Surrey and Sussex Healthcare NHS Trust
Sharmila Sivarajan	Consultant Obstetrician and Gynaecologist – East Surrey Hospital	Surrey and Sussex Healthcare NHS Trust
Sue Moore	Clinical Nurse Manager – Tameside	Tameside Hospital NHS Foundation Trust
Julie Harland	Risk Manager – Musgrove Park Hospital	Taunton and Somerset NHS Foundation Trust
Sue Spooner	Neonatal Unit Manager – Musgrove Park Hospital	Taunton and Somerset NHS Foundation Trust
Bev Paterson	Lead Midwife Risk/Bereavement – Russells Hall Hospital	The Dudley Group NHS Foundation Trust
Eithne Harte	Senior Midwife – The Hillingdon Hospital	The Hillingdon Hospitals NHS Foundation Trust
Anita Hutchins	Acting Head of Midwifery	The Hillingdon Hospitals NHS Foundation Trust
Jide Menakaya	Consultant Neonatologist – Hillingdon Hospital	The Hillingdon Hospitals NHS Foundation Trust
Ann Palmer	Bereavement Midwife – The Hillingdon Hospital	The Hillingdon Hospitals NHS Foundation Trust
Beverley Gordon	Clinical Governance Lead – Ipswich Hospital	The Ipswich Hospital NHS Trust

Sharon Beanland	Sister Paediatric Intensive Care Unit	The Leeds Teaching Hospitals NHS Trust
Tracey Glanville	Consultant	The Leeds Teaching Hospitals NHS Trust
Simon Newell	Consultant Neonatologist	The Leeds Teaching Hospitals NHS Trust
Medha Rathod	Consultant Obstetrician	The Leeds Teaching Hospitals NHS Trust
David Gibson	Consultant Lead Neonatologist – Pinderfields General Hospital	The Mid Yorkshire Hospitals NHS Trust
Katy Harrison	Consultant Locum Obstetrics and Gynaecology – Dewsbury and District Hospital	The Mid Yorkshire Hospitals NHS Trust
Sarah Hall	Bereavement Midwife – Pinderfields Hospital Wakefield and Pontefract Hospital	The Mid Yorkshire Hospitals NHS Trust
Chitra Rajagopalan	Consultant Obstetrician and Gynaecologist – Dewsbury and District Hospital	The Mid Yorkshire Hospitals NHS Trust
Rhona Collis	Senior Midwife Risk Management – Royal Victoria Infirmary	The Newcastle upon Tyne Hospitals NHS Foundation Trust
Richard Hearn	Consultant Paediatrician – Royal Victoria Infirmary	The Newcastle upon Tyne Hospitals NHS Foundation Trust
Michaela Higson	Risk Management Midwife – Royal Victoria Infirmary	The Newcastle upon Tyne Hospitals NHS Foundation Trust
Jenna Wall	Senior Midwife	The Newcastle upon Tyne Hospitals NHS Foundation Trust
Lydia Bowden	Consultant Neonatologist – Royal Oldham Hospital	The Pennine Acute Hospitals NHS Trust
Anan Boulos	Consultant Obstetrician and Gynaecologist	The Pennine Acute Hospitals NHS Trust
Susan Brierley	Bereavement Midwife – Royal Oldham	The Pennine Acute Hospitals NHS Trust
Caroline Rice	Consultant Obstetrician – North Manchester General Hospital	The Pennine Acute Hospitals NHS Trust
Kathryn Beechinor	Staff Midwife – The Portland Hospital	The Portland (HCA Health Care)
Fiona Walkinshaw	Women's and Neonatal Services Manager – The Portland Hospital	The Portland (HCA Health Care)
Deborah Bridgewater	Maternity Bereavement Advisor for Women's Health	The Princess Alexandra Hospital NHS Trust
Jacqui Featherstone	Head of Midwifery – The Princess Alexandra Hospital	The Princess Alexandra Hospital NHS Trust
Yvonne Fulcher	Delivery Suite Co-coordinator/ Bereavement Support Midwife – Queen Elizabeth Hospital	The Queen Elizabeth Hospital King's Lynn NHS Foundation Trust
Jodie Jupe	Quality and Safety Specialist Midwife/Central Delivery Suite Coordinator – The Queen Elizabeth Hospital	The Queen Elizabeth Hospital King's Lynn NHS Foundation Trust
Radhika Gosakan	Consultant	The Rotherham NHS Foundation Trust
Kathryn Parke	Senior Nurse/Service Manager – Rotherham General Hospital	The Rotherham NHS Foundation Trust
Clare Storer	Bereavement Specialist Midwife – Rotherham Hospital	The Rotherham NHS Foundation Trust
Eleanor Holyoak	Clinical Lead for Risk and Birthing Unit	The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust
Jenny Turner	Community Midwife – Bournemouth Birth Centre	The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust
Carole Sadler	Specialist Midwife for Bereavement Services – New Cross Hospital	The Royal Wolverhampton Hospitals NHS Trust
Jan Latham	Bereavement Specialist Midwife – Princess Royal Hospital	The Shrewsbury and Telford Hospital NHS Trust
Hazel Harrison	Labour Ward Matron	United Lincolnshire Hospitals NHS Trust
Jude Wells	Staff Midwife	United Lincolnshire Hospitals NHS Trust
Margaret Crawford	Consultant Paediatrician – Pilgrim Hospital	United Lincolnshire Hospitals NHS Trust
Narasimharao Kollipara	Consultant Neonatologist – Lincoln County Hospital	United Lincolnshire Hospitals NHS Trust
Lyn Gilbert	Specialist Bereavement Midwife – University College London Hospital	University College London Hospitals NHS Foundation Trust
Cherie Raphael	Bereavement Coordinator – University College London Hospital	University College London Hospitals NHS Foundation Trust
Chris Navin	Bereavement Midwife – Wythenshaw Hospital	University Hospital of South Manchester NHS Foundation Trust

Helen Thompson	Head of Midwifery	University Hospital of South Manchester NHS Foundation Trust
Kim Allsop	Labour Ward Manager – Princess Anne Hospital (but covers SB at all sites)	University Hospital Southampton NHS Foundation Trust
Sarah Davidson	Consultant Neonatologist	University Hospital Southampton NHS Foundation Trust
Robert Ironton	Consultant – Princess Anne Hospital, but covers all sites	University Hospital Southampton NHS Foundation Trust
Mark Johnson	ST8 Registrar, Neonatal Medicine	University Hospital Southampton NHS Foundation Trust
Kate Blake	Consultant Neonatologist University Hospital Coventry	University Hospitals Coventry and Warwickshire NHS Trust
Letoya Smith	Safeguarding Children's Clerk – University Hospital Coventry	University Hospitals Coventry and Warwickshire NHS Trust
Karen MacDonald–Taylor	Patient Safety Advisor – St Michael's Hospital	University Hospitals of Bristol NHS Foundation Trust
Denise Brookes	Delivery Suite Manager – Leicester Royal Infirmary	University Hospitals of Leicester NHS Trust
Penny McParland	Consultant Obstetrician – Leicester Royal Infirmary	University Hospitals of Leicester NHS Trust
Samantha Parker	Quality and Safety Facilitator – Leicester Royal Infirmary	University Hospitals of Leicester NHS Trust
Julia Alcide	Consultant in Obstetrics and Gynaecology – Furness General Hospital	University Hospitals of Morecambe Bay NHS Foundation Trust
Rebecca Bleackley	Labour Ward Coordinator	University Hospitals of Morecambe Bay NHS Foundation Trust
Kath Granger	Consultant, Obstetrics and Gynaecology – Royal Lancaster Infirmary	University Hospitals of Morecambe Bay NHS Foundation Trust
Sharon Perkins	Maternity Risk Manager – Lancaster Royal Infirmary, Furness General Hospital, Barrow and Westmorland General Hospital Kendal	University Hospitals of Morecambe Bay NHS Foundation Trust
Alison Sambrook	Consultant Governance/Lead Consultant Obstetrician and Gynaecologist	University Hospitals of Morecambe Bay NHS Foundation Trust
Celia Sykes	Labour Ward	University Hospitals of Morecambe Bay NHS Foundation Trust
Lee Abbott	Consultant Neonatologist	University Hospitals of North Midlands NHS Trust
Margaret Elizabeth Jennings	Bereavement Specialist Midwife – Royal Stoke University Hospital	University Hospitals of North Midlands NHS Trust
Sarah Lake	Bereavement Specialist Midwife – Royal Stoke Hospital	University Hospitals of North Midlands NHS Trust
Carol Hollington	Quality and Risk Management Matron – Walsall Manor Hospital	Walsall Healthcare NHS Trust
Lisa Poston	Ward Manager	Walsall Healthcare NHS Trust
Rita Arya	Consultant Obstetrician Labour Ward Lead – Warrington Hospital	Warrington and Halton Hospitals NHS Foundation Trust
Ann Goodwin	Clinical Risk Manager Maternity – Warrington Hospital	Warrington and Halton Hospitals NHS Foundation Trust
Jude Haslam	Midwife – Warrington Hospital	Warrington and Halton Hospitals NHS Foundation Trust
Debra Yates	Bereavement Coordinator	Warrington and Halton Hospitals NHS Foundation Trust
Justine Chung	Senior Midwife – Watford General Hospital	West Hertfordshire Hospitals NHS Trust
Renton L'Heureux	Consultant Paediatrician/ Neonatologist – Watford General Hospital	West Hertfordshire Hospitals NHS Trust
Abigail Buhagiar	Senior Midwife	West Suffolk NHS Foundation Trust
Louise Fairs	Clinical Manager Inpatient Services – St Richards Hospital	Western Sussex Hospitals NHS Foundation Trust
Susan McRae	Deputy Sister, Neonatal Unit – St Richard's Hospital	Western Sussex Hospitals NHS Foundation Trust

Helen Pratt	Senior Clinical Midwifery Manager – Worthing Hospital	Western Sussex Hospitals NHS Foundation Trust
Maggie Warren	Labour Ward Coordinator – Worthing Hospital	Western Sussex Hospitals NHS Foundation Trust
Zita Warren	Neonatal Unit Ward Manager – St Richard’s Hospital	Western Sussex Hospitals NHS Foundation Trust
Janice White	Labour Ward Coordinator – St Richard’s Hospital	Western Sussex Hospitals NHS Foundation Trust
Jenny Gamlin	Supervisor of Midwives – Weston General Hospital	Weston Area Health NHS Trust
Jane Laking	Bereavement Support Midwife – Whittington Hospital	Whittington Health
Shri Babarao	Consultant Neonatologist	Wirral University Teaching Hospital NHS Foundation Trust
Donna Lloyd–Jones	Quality and Safety Specialist – Arrowe Park Hospital	Wirral University Teaching Hospital NHS Foundation Trust
Diane Williams	Clinical Governance Coordinator – Arrowe Park Hospital	Wirral University Teaching Hospital NHS Foundation Trust
Trudy Berlet	Bereavement Support Midwife – Royal Worcester Hospital	Worcestershire Acute Hospitals NHS Trust
Vicky Bullock	Matron, Neonatal Services – The Worcestershire Royal Hospital, Worcester and the Alexandra Hospital, Redditch	Worcestershire Acute Hospitals NHS Trust
Karen Kokoska	Deputy Head of Nursing and Midwifery/Divisional Governance Lead	Worcestershire Acute Hospitals NHS Trust
Julie Armstrong	Neonatal Lead Nurse – Royal Albert Edward Infirmary	Wrightington, Wigan and Leigh NHS Foundation Trust
Cathy Stanford	Governance Lead Maternity and Child Health – Royal Albert Edward Infirmary	Wrightington, Wigan and Leigh NHS Foundation Trust
Maxine Chong	Head of Midwifery and Nursing – Hereford County Hospital	Wye Valley NHS Trust
Simon Meyrick	Consultant Paediatrician – Hereford County Hospital	Wye Valley NHS Trust
Andrea Walker	Midwife – Hereford County Hospital	Wye Valley NHS Trust
Leila Fahel	Consultant Obstetrician and Gynaecologist	York Teaching Hospital NHS Foundation Trust
Olujimi Jibodu	Consultant Obstetrician and Gynaecologist Labour Ward Lead Clinician – York Hospital	York Teaching Hospital NHS Foundation Trust
Kirsten Mack	Consultant Paediatrician with Expertise in Cardiology – Scarborough General Hospital	York Teaching Hospital NHS Foundation Trust
Guy Millman	Consultant Paediatrician – York Hospital	York Teaching Hospital NHS Foundation Trust
Freya Oliver	Matron for Maternity and Gynaecology – Scarborough	York Teaching Hospital NHS Foundation Trust
Jacqui Tully	Midwifery Matron, Public Health and Risk – Yeovil District Hospital	Yeovil District Hospital NHS Foundation Trust

A2.2 Description of the data items reported to MBRRACE-UK

Woman's identifiers

Family name/surname
 Given name/first name
 Address
 Postcode
 NHS/Community Health Index (CHI) number
 Date of birth
 Hospital number in this hospital

Woman's details

Ethnic category
 Country of birth
 Time resident in the UK at booking
 Documented communication difficulties?
 Age at leaving full-time education
 Main support during pregnancy
 Employment status at booking
 Did woman have a partner?
 Partner's employment status at booking
 Blood relationship of woman to baby's father
 Was woman refugee or asylum seeker?

Woman's health

Pre-existing medical problems
 Smoking Status
 Breath carbon monoxide
 Weekly alcohol consumption pre-pregnancy
 Weekly alcohol consumption at booking
 Was there documented alcohol abuse?
 Was there documented substance abuse?

Previous pregnancies^a

Outcome for fetus
 Birthweight
 Infant death
 Year
 Gestational age
 Fetal anomaly

Obstetric history

Number of previous pregnancies
 Previous pregnancy complications

Booking

Intended type of unit at booking
 Intended type of care at booking
 Intended care provider
 Date of first booking appointment
 Final estimated date of delivery (EDD)
 Basis for EDD
 Number of fetuses present at booking/ultrasound
 Chorionicity
 Assisted conception
 Woman's height in cm
 Woman's first recorded weight in kg
 Was woman too heavy for hospital scales?

First recorded BMI (if height/weight unavailable)

Antenatal care provision

Number of antenatal appointments attended
 Documented poor appointment attender
 Type of unit (intended at onset)
 Type of care (intended at onset)
 Care provider (intended at onset)
 Reason if transfer of care (between booking and onset)
 Type of unit (actual place of delivery)
 Type of care (actual place of delivery)
 Care provider (actual place of delivery)
 Reason if transfer of care (post-onset)

Delivery and outcomes summary^a

Case definition
 Was this a termination?
 Reason for termination

Labour and delivery^a

Onset of labour
 Date and time of onset and care in labour
 Time of onset
 Prolonged rupture of membranes (> 24 hours)?
 Date of rupture
 Presentation at delivery
 Attempted modes of delivery
 Final mode of delivery
 Type of caesarean section
 Primary indication for caesarean section
 Was the baby born in water?
 Delivery complications
 Date of delivery/birth
 Time of delivery/birth
 Were blood gases done?
 Source of the blood gases
 Arterial:
 Cord PH
 Base excess/deficit
 Lactate
 Venous:
 Cord PH
 Base excess/deficit
 Lactate

Baby/fetus outcomes^a

NHS/CHI number
 Sex of baby/fetus
 Birth order
 Birthweight
 Gestational age at delivery: weeks and days
 Heart beat in first minute
 Cord pulse in first minute
 Active body movement in first minute
 Respiratory activity in first minute
 Apgar score at 1 minutes
 Apgar score at 5 minutes

Documented child protection issues?
 Documented history of domestic abuse?
 Gestational age at confirmation of death: weeks and days^b
 Date death confirmed^b
 Was baby alive at onset of care?^b
 Was baby admitted to a neonatal unit?^c
 Was baby transferred to another organisation after birth?^c
 Primary reason for the first transfer?^c
 Number of transfers^c
 Type of unit where death occurred^c
 Care provider at time of death^c
 Was the death unattended?^c
 Date of death^c
 Time of death^c

Causes of Death^a

Sources of information used to determine cause of death
 Cause of death as written in notes or on the Death Certificate
 Primary cause of death:
 condition
 CODAC code
 Baby/fetus associated condition:
 condition
 CODAC code

Post-Mortem^a

Was a post-mortem offered?
 Was consent given for a post-mortem?
 Consented post-mortem procedures
 Was the placenta sent for histology?
 Was the case discussed with a coroner/procurator fiscal?
 Was the case accepted as a coroner/procurator fiscal's case?

Clinicians

Obstetrician responsible for care
 Neonatologist/paediatrician responsible for care

^a recorded for each baby/fetus

^b stillbirth and late fetal losses only

^c live births only

A2.3 Approvals for collection of patient identifiable data

The necessary approvals obtained by the MNI-CORP programme prior to the start of the data collection process are listed below. These were applied for in order to collect patient identifiable data and access information collected by statutory organisations without consent.

Box 2: Approvals granted for UK collection of patient identifiable data and access to statutory data without consent

England and Wales

The Confidentiality Advisory Group of the Health Research Authority:

ECC 5-05 (f)/2012 (from 10.10.2012); 15/CAG/0119 (from 01.05.2015)

Health & Social Care Information Centre (HSCIC), Data Access Advisory Group: IC604DS

Scotland

The NHS Scotland Caldicott Guardian: 2014-62 MBRRACE-UK Programme – Update (2013-05)

The Privacy Advisory Committee, ISD, NHS National Services Scotland: PAC16/14

Northern Ireland

Due to the different data privacy arrangements in Northern Ireland only de-identified data is provided to the MNI-CORP programme and this is provided via the NIMACH office

A2.4 The system for online data submission

Security

Access to the MBRRACE-UK website is via the internet using the secure HTTPS protocol. The web and database servers are housed in a secure data centre with firewall protection. All staff requesting online access must be approved by their Trust or Health Board and log-in is only possible with either an NHS or UK University email address. When an approved reporter first accesses the website they are required to request an activation code. This is used as a one-time password which must be changed on first access. All passwords must meet a set of criteria which ensures all passwords accepted are 'strong': in addition, they must be changed at regular intervals and are stored securely. Reporters are assigned to a profile which restricts their access to only the appropriate parts of the website for their role (the system is used both to report deaths and to provide access to anonymised medical case notes for assessors taking part in MBRRACE-UK confidential enquiries).

All patient identifiers are encrypted before they are stored. Access to identifiable data is only allowed under very limited circumstances. Reporters may view the data from their own Trust or Health Board (subject to the use of a valid password) while access to identifiable data by MBRRACE-UK is subject to NHS information governance, security and confidentiality regulation (Box 2).

Data integrity and validation

Reporters wishing to report a new death or edit an existing death record are required to confirm the mother's details (NHS or CHI number, name, date of birth) on each occasion. The nationally defined algorithm for checking NHS and CHI numbers is used to ensure only valid numbers are entered.

Where appropriate, the information reported is checked against a range of acceptable values during the data entry process. For each such data item there is a range of expected values and an absolute range. If a value is outside the expected range the reporter is warned and informed of the range. If it is outside the absolute range then the value cannot be entered and, additionally, the record cannot be closed. Before the reporter can close a record additional checks are carried out; for example, date values across the whole record are validated against each other to test for consistency.

There is a facility whereby reporters are allowed to indicate that particular data items are not known. The number of data items that allow the 'not known' option will gradually be reduced, as reporters become more familiar with the MBRRACE-UK system and the data requirements.

For a significant number of deaths some of the data required will be held in more than one hospital, e.g. some aspects of maternal data after the death of a baby following postnatal transfer. If the additional information is held within the same Trust or Health Board but on a different site then reporters can access all the information they need in collaboration with obstetric, midwifery, neonatal or nursing colleagues. However, if the missing information is held by a different Trust or Health Board then the MBRRACE-UK system allows the reporter to temporarily assign the MBRRACE-UK record to the other Trust or Health Board who then return it once the missing information has been provided.

Online help

Help is available on every data entry screen through FAQs. In addition, many of the variables have specific help available by clicking on the 'Help' icon. Also, on every screen of the website there is a function to allow the reporter to enter a help request. This is sent via email to the MBRRACE-UK office for attention by the technical, clinical or administrative staff, as appropriate.

Reports

The MBRRACE-UK online reporting system allows access to information relating to local cases:

- the Trust/Health Board **Reported Cases** list provides abbreviated details of all cases reported;
- the Trust/Health Board **Summary** provides the number of cases by year, case-type and unit;
- the Trust/Health Board **Case Review** list provides the opportunity for local reporters to check the accuracy (within a fixed time frame) of the data reported by their organisation prior to the analysis for the report.

A 'sort' facility is available to facilitate the identification of cases from a particular year or from a particular hospital, or to distinguish between cases of stillbirth and neonatal death. The display order of case lists can be changed by clicking on any of the headings.

Web browser compatibility

The security requirements of the NHS in relation to electronic data flows mandate that the highest levels of security be employed. In order for this to be achieved, those accessing the MBRRACE-UK reporting system need access to an up-to-date web browser compatible with these security specifications. Appropriate browsers are available to download free of charge, although the installation of such software may require the co-operation of local NHS IT departments.

Changes to the perinatal mortality surveillance reporting system in 2014

In 2014, the MBRRACE-UK reporting system was improved to provide local reporters with up-to-date information about the cases reported to MBRRACE-UK for their Trust or Health Board and also details of potentially missing cases. The system now provides:

- downloadable summary tables detailing the total number of deaths reported by the Trust or Health Board and, for each, the year of birth and type of death;
- details of all perinatal deaths reported by the Trust or Health Board, listed by MBRRACE-UK case id, date started and completed, mother's name, NHS number, postcode at time of delivery, case type, baby's NHS number, gestational age, date of delivery, date of death, birthweight, sex and number of fetuses for each pregnancy;
- the facility to identify a case reported on the system using the mother's NHS number in order to avoid duplicate data entry;
- a list of deaths identified from death registrations but yet to be reported to MBRRACE-UK;
- the facility to assign an MBRRACE-UK record temporarily to another Trust or Health Board in order that additional information, such as obstetric history, can be provided;
- the facility to re-open an MBRRACE-UK record in order to provide updated information or correct data for a particular death.

A2.5 Ensuring all births for 2014 and extended perinatal deaths are identified

The sources of data used to ensure complete data collection of births in 2014 and extended perinatal deaths for this cohort are listed in Box 3. The combining and checking of this data is outlined briefly below.

Box 3: Data sources for the ascertainment of UK births and perinatal deaths

England and Wales

Birth registration data – Office for National Statistics (ONS)

Death registration data – Office for National Statistics (ONS)

NN4B data on all births – Health and Social Care Information Centre (HSCIC)

Scotland

Birth registration data – National Records of Scotland (NRS)

Death registration data – National Records of Scotland (NRS)

SMR02 inpatient data - ISD, NHS National Statistics Scotland

Northern Ireland

Birth registration data - NIMACH, Health and Social Care Public Health Agency – derived from Northern Ireland Maternity System (NIMATS)

Death registration data - NIMACH, Health and Social Care Public Health Agency – derived from Northern Ireland Maternity System (NIMATS)

Inpatient data - NIMACH, Health and Social Care Public Health Agency – derived from Northern Ireland Maternity System (NIMATS)

Crown Dependencies

Birth registration data - Health and Social Services Department, States of Guernsey

Death registration data - Health and Social Services Department, States of Guernsey

Birth registration data - Health Intelligence Unit, Public Health Services, States of Jersey

Death registration data - Health Intelligence Unit, Public Health Services, States of Jersey

NN4B data on all births, Isle of Man – Health and Social Care Information Centre (HSCIC)

Identifying all extended perinatal deaths

Statutorily registered deaths (from ONS for England and Wales and NRS for Scotland) which meet the MBRRACE-UK reporting criteria are matched to the deaths reported to MBRRACE-UK in order to identify any stillbirths or neonatal deaths which have not been reported to MBRRACE-UK. Due to the different system of implementation in Northern Ireland, the NIMACH office staff ensured full validation of their data on our behalf.

For England, Wales and Scotland the matching is performed using a combination of deterministic and probabilistic matching methods based on the mother's given name, mother's family name, postcode of residence at time of delivery, Trust or Health Board of birth, baby's NHS number (England – where available), CHI number (Scotland), gestational age at delivery, date of delivery and date of death.

Once the checking is complete the MBRRACE-UK Lead Reporters are notified of any known deaths that have occurred in their Trust or Health Board which could not be identified on the MBRRACE-UK system and asked to confirm that this was a death in their organisation and provide the missing information.

This checking for deaths missing from the MBRRACE-UK database cannot start until information on statutorily registered deaths are provided to MBRRACE-UK by ONS (England and Wales) and NRS (Scotland), meaning that we cannot inform MBRRACE-UK Lead Reporters of missing deaths until some months after the event. Although most missing deaths can be identified in this way, not all deaths to be reported to MBRRACE-UK are available from statutory sources in a timely manner:

1. A small percentage of statutorily registered deaths are registered only after considerable delay, most often perhaps because an inquest was being held.
2. Late fetal losses delivered at 22⁺⁰ to 23⁺⁶ weeks gestational age are not officially registered.
3. RCOG guidance [1, 2] is that stillbirths delivered at 24⁺⁰ weeks gestational age or greater where the death was confirmed before 24⁺⁰ weeks gestational age should not be registered as stillbirths; however, in order to investigate variations in the reporting of stillbirths occurring at around 24⁺⁰ weeks gestational age, these cases should all be reported to MBRRACE-UK.

There are no timely and easily accessible data sources for the deaths that have not been officially registered and, therefore, it is not possible to ensure that all of these deaths have been reported to MBRRACE-UK.

Identifying all births in 2014

Individual level information on all births in the UK and Crown Dependencies is obtained in order to generate mortality rates adjusted for maternal, baby, and socio-demographic risk factors. Information for England, Wales and the Isle of Man (NN4B and ONS birth registration data), Scotland (NRS and ISD), Northern Ireland (NIMATS), Bailiwick of Guernsey (Health and Social Services Department) and the Bailiwick of Jersey (Health Intelligence Unit) were combined to give a single dataset of births for the whole UK and Crown Dependencies. This data was then combined with the information on the deaths to obtain the final data for analysis.

The allocation of births to an organisation is complex given the wide variation in the recording of the notifying organisation and it was not always possible to easily identify the place of birth from the data reported. In many cases this either required further detailed enquiry or correction of the place of birth,

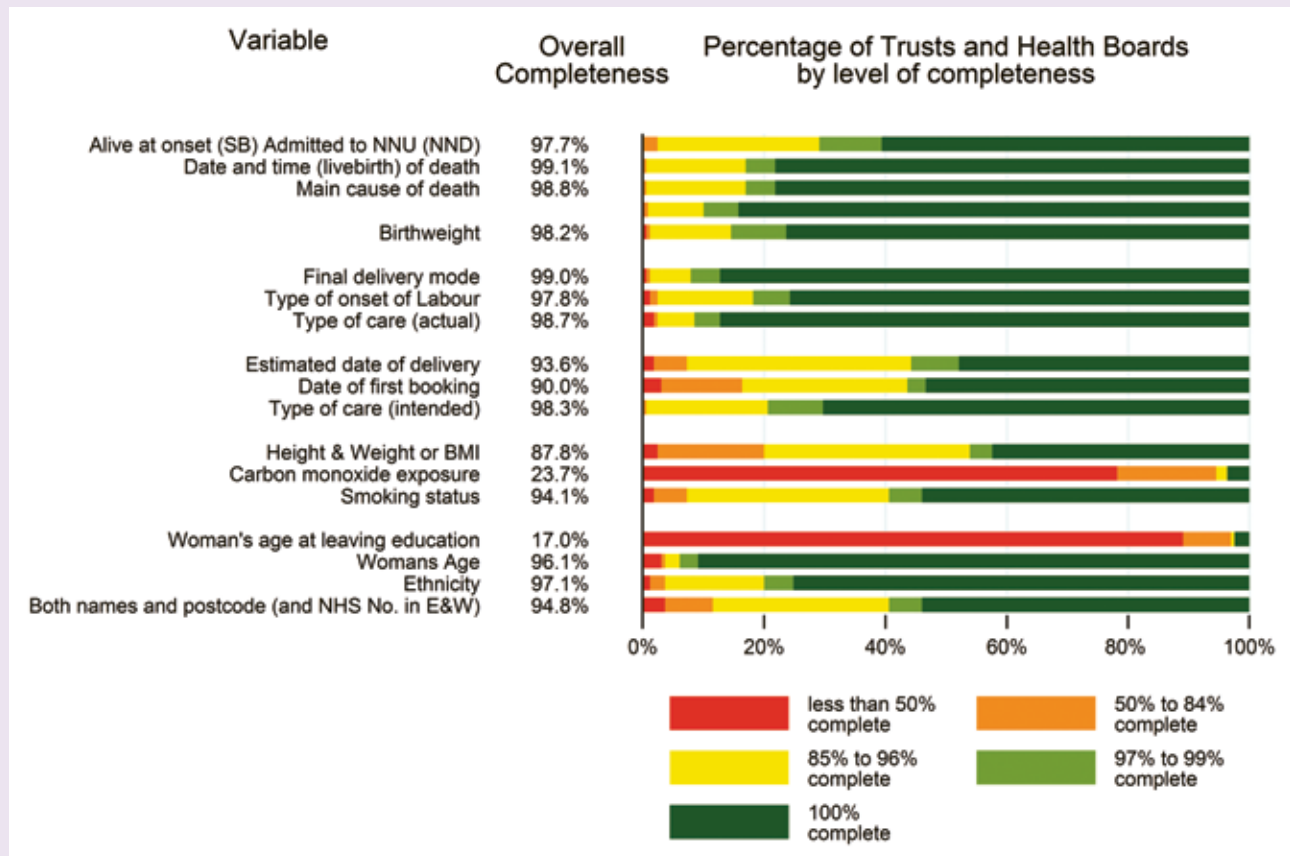
as the incorrect organisation had inadvertently been recorded. Complete and accurate recording is vital to enable MBRRACE-UK to allocate births to the appropriate Trust or Health Board for analysis and reporting.

Home births were allocated to the Trust or Health Board responsible for this service whenever this was recorded, in order for the correct denominator(s) to be calculated. In 2015 the NN4B system was replaced by the [Personal Demographics Service](#) (PDS), which is a component of the [NHS Spine](#). All Trusts and Health Boards in England, Wales and the Isle of Man completing information for the PDS should ensure that they are identified as the notifying organisation for all births related to their service.

A2.6 Completeness of the data reported to MBRRACE-UK

One aspect of data quality is the completeness of the data. In Figure 25, the overall completeness of selected key variables is shown together with the percentage of Trusts or Health Boards achieving different levels of completeness for their data.

Figure 25: Level of completeness of data reported by Trusts and Health Boards: United Kingdom and Crown Dependencies, for births in 2014



The completeness for groups of key data items reported to MBRRACE-UK for those deaths used in Chapter 3 is shown in Table 27, by reporting Trust and Health Board. The percentage shown is the combined percentage for all of the items in each group:

- Mother's details:** given name (not Northern Ireland); family name (not Northern Ireland); post-code of residence at time of delivery (not Northern Ireland); NHS Number (not Scotland or Northern Ireland); ethnicity; age, age at leaving full-time education.
- Booking information:** smoking status; breath carbon monoxide; BMI.
- Antenatal care:** intended type of care at booking; intended place of delivery at booking; EDD.
- Delivery:** actual place of delivery; date and time of delivery; final delivery mode; type of onset of labour.
- Baby's characteristics:** birthweight; gestational age at delivery.
- Baby's outcome:** date death confirmed (stillbirths only); whether alive at onset of care in labour (stillbirths only), whether admitted to Neonatal Unit (neonatal deaths only); main cause of death.

The colours in the table represent the level of completeness for each Trust and Health Board:

- **red**: less than 70.0% complete;
- **amber**: 70.0% to 84.9% complete;
- **yellow**: 85.0% to 96.9% complete;
- **light green**: 97.0% to 99.9% complete;
- **dark green**: 100% complete.

Table 27: Completeness of selected data items reported to MBRRACE-UK by NHS Trust (England), Health Board (Scotland and Wales), Health and Social Care Trust (Northern Ireland), and Crown Dependency: United Kingdom and Crown Dependencies, for births in 2014

Trust or Health Board	Mother's details	Booking information	Antenatal care	Delivery	Baby's characteristics	Baby's outcome
ENGLAND						
Airedale NHS Foundation Trust	75.0	81.8	100.0	100.0	100.0	96.9
Alder Hey Children's NHS Foundation Trust	52.7	9.2	40.7	50.0	72.2	98.1
Ashford and St Peter's Hospitals NHS Foundation Trust	75.0	60.6	84.8	100.0	100.0	98.4
Barking Havering and Redbridge University Hospitals NHS Trust	75.5	63.7	94.2	98.9	97.8	100.0
Barnsley Hospital NHS Foundation Trust	95.0	66.6	100.0	100.0	100.0	100.0
Barts Health NHS Trust	81.2	63.5	95.0	100.0	100.0	99.3
Basildon and Thurrock University Hospitals NHS Foundation Trust	77.6	91.6	96.4	100.0	100.0	98.8
Bedford Hospital NHS Trust	89.0	70.8	100.0	100.0	100.0	95.8
Birmingham Children's Hospital NHS Foundation Trust	56.7	28.2	61.5	44.2	46.1	100.0
Birmingham Women's NHS Foundation Trust	75.0	65.0	96.4	97.0	100.0	99.2
Blackpool Teaching Hospitals NHS Foundation Trust	73.6	83.3	96.2	95.8	94.4	92.5
Bolton NHS Foundation Trust	80.2	65.7	99.1	100.0	100.0	99.1
Bradford Teaching Hospitals NHS Foundation Trust	73.2	73.6	95.3	99.1	98.2	95.3
Brighton and Sussex University Hospitals NHS Trust	78.8	68.3	90.5	100.0	97.4	100.0
Buckinghamshire Healthcare NHS Trust	72.8	68.1	100.0	100.0	100.0	98.5
Burton Hospitals NHS Foundation Trust	85.0	68.8	95.5	98.3	100.0	100.0
Calderdale and Huddersfield NHS Foundation Trust	76.3	74.5	99.1	100.0	98.6	100.0
Cambridge University Hospitals NHS Foundation Trust	73.5	51.5	88.6	99.0	100.0	99.3
Central Manchester University Hospitals NHS Foundation Trust	72.6	49.4	82.7	97.0	100.0	99.2
Chelsea and Westminster Hospital NHS Foundation Trust	70.7	63.5	89.3	99.0	98.1	98.7
Chesterfield Royal Hospital NHS Foundation Trust	78.3	64.4	95.5	100.0	100.0	100.0
City Hospitals Sunderland NHS Foundation Trust	63.8	45.6	82.7	92.5	88.8	98.7
Colchester Hospital University NHS Foundation Trust	75.0	93.3	98.3	100.0	97.5	98.3

Trust or Health Board	Mother's details	Booking information	Antenatal care	Delivery	Baby's characteristics	Baby's outcome
Countess of Chester Hospital NHS Foundation Trust	75.0	84.8	93.9	100.0	95.4	100.0
County Durham and Darlington NHS Foundation Trust	76.2	80.0	100.0	100.0	100.0	98.3
Croydon Health Services NHS Trust	76.2	63.3	95.0	97.5	100.0	95.0
Dartford and Gravesham NHS Trust	100.0	98.4	100.0	100.0	100.0	100.0
Derby Teaching Hospitals NHS Foundation Trust	75.0	65.5	96.7	99.1	100.0	100.0
Doncaster and Bassetlaw Hospitals NHS Foundation Trust	85.0	81.3	97.3	99.0	100.0	94.6
Dorset County Hospital NHS Foundation Trust	68.7	62.5	100.0	100.0	100.0	91.6
East Cheshire NHS Trust	57.1	100.0	100.0	100.0	100.0	95.2
East Kent Hospitals University NHS Foundation Trust	76.6	66.6	94.0	98.3	98.8	94.0
East Lancashire Hospitals NHS Trust	77.0	84.6	95.3	99.0	100.0	96.6
East Sussex Healthcare NHS Trust	75.0	66.6	100.0	96.8	100.0	95.8
East and North Hertfordshire NHS Trust	73.6	53.7	90.7	100.0	94.4	96.2
Epsom and St Helier University Hospitals NHS Trust	85.5	71.9	100.0	100.0	100.0	100.0
Frimley Health NHS Foundation Trust	81.2	65.9	100.0	100.0	100.0	100.0
Gateshead Health NHS Foundation Trust	77.0	69.4	100.0	100.0	100.0	100.0
George Eliot Hospital NHS Trust	100.0	100.0	100.0	100.0	100.0	100.0
Gloucestershire Hospitals NHS Foundation Trust	75.7	69.6	93.9	100.0	98.4	100.0
Great Ormond Street Hospital for Children NHS Foundation Trust	59.3	23.6	48.6	85.4	89.5	98.6
Great Western Hospitals NHS Foundation Trust	75.0	66.6	91.6	100.0	100.0	100.0
Guy's and St Thomas' NHS Foundation Trust	73.0	60.0	86.1	98.0	100.0	100.0
Hampshire Hospitals NHS Foundation Trust	75.0	66.6	100.0	100.0	100.0	100.0
Harrogate and District NHS Foundation Trust	85.0	73.3	100.0	100.0	100.0	100.0
Heart of England NHS Foundation Trust	80.0	69.2	95.3	99.6	94.6	98.4
Hinchingbrooke Health Care NHS Trust	75.0	66.6	95.2	100.0	92.8	100.0
Homerton University Hospital NHS Foundation Trust	73.1	77.7	94.4	100.0	100.0	100.0
Hull and East Yorkshire Hospitals NHS Trust	82.3	60.6	99.2	100.0	100.0	100.0
Imperial College Healthcare NHS Trust	78.6	69.8	91.9	98.1	98.7	97.5
Isle of Wight NHS Trust	75.0	83.3	100.0	100.0	100.0	100.0
James Paget University Hospitals NHS Foundation Trust	86.1	66.6	96.2	100.0	100.0	96.2
Kettering General Hospital NHS Foundation Trust	92.1	92.9	100.0	100.0	100.0	98.2
King's College Hospital NHS Foundation Trust	74.5	63.2	94.9	99.1	95.7	98.8
Kingston Hospital NHS Trust	74.0	66.6	100.0	100.0	100.0	100.0
Lancashire Teaching Hospitals NHS Foundation Trust	85.0	69.3	100.0	100.0	100.0	97.3
Lewisham and Greenwich NHS Trust	74.4	73.0	98.4	100.0	98.8	98.4
Liverpool Women's NHS Foundation Trust	73.1	59.1	82.5	99.6	98.7	99.5
London North West Healthcare NHS Trust	75.6	72.6	98.2	99.3	98.7	96.5
Luton and Dunstable Hospital NHS Foundation Trust	72.9	71.1	100.0	99.3	100.0	99.0
Maidstone and Tunbridge Wells NHS Trust	75.0	64.7	96.0	100.0	97.0	98.0
Medway NHS Foundation Trust	82.5	66.6	94.9	99.2	96.9	98.9

Trust or Health Board	Mother's details	Booking information	Antenatal care	Delivery	Baby's characteristics	Baby's outcome
Mid Cheshire Hospitals NHS Foundation Trust	75.0	75.0	94.4	100.0	95.8	100.0
Mid Essex Hospital Services NHS Trust	73.6	70.1	96.4	94.7	100.0	98.2
Milton Keynes Hospital NHS Foundation Trust	75.0	66.6	100.0	100.0	100.0	100.0
Norfolk and Norwich University Hospitals NHS Foundation Trust	75.0	79.4	96.0	94.8	97.0	99.0
North Bristol NHS Trust	83.3	68.5	96.2	100.0	98.6	100.0
North Cumbria University Hospitals NHS Trust	77.0	66.6	100.0	100.0	100.0	97.2
North Middlesex University Hospital NHS Trust	74.0	84.0	96.0	100.0	100.0	100.0
North Tees and Hartlepool NHS Foundation Trust	74.0	87.6	95.0	98.1	98.1	96.2
Northampton General Hospital NHS Trust	78.4	66.6	100.0	100.0	100.0	100.0
Northern Devon Healthcare NHS Trust	84.3	66.6	100.0	100.0	100.0	95.8
Northern Lincolnshire and Goole Hospitals NHS Foundation Trust	76.1	66.6	98.4	100.0	100.0	95.2
Northumbria Healthcare NHS Foundation Trust	82.5	96.6	100.0	100.0	100.0	100.0
Nottingham University Hospitals NHS Trust	84.0	78.7	96.9	100.0	99.3	99.1
Oxford University Hospitals NHS Trust	76.1	61.0	91.7	97.3	99.2	98.9
Peterborough and Stamford Hospitals NHS Foundation Trust	74.0	69.2	98.7	100.0	100.0	98.7
Plymouth Hospitals NHS Trust	73.1	62.6	95.1	98.1	100.0	100.0
Poole Hospital NHS Foundation Trust	85.0	80.0	100.0	100.0	100.0	100.0
Portsmouth Hospitals NHS Trust	80.4	58.3	92.7	100.0	100.0	94.7
Royal Berkshire NHS Foundation Trust	75.0	68.6	100.0	100.0	100.0	99.0
Royal Brompton and Harefield NHS Foundation Trust	65.0	26.6	66.6	80.0	100.0	100.0
Royal Cornwall Hospitals NHS Trust	78.7	66.6	98.3	100.0	100.0	95.0
Royal Devon and Exeter NHS Foundation Trust	81.2	54.1	83.3	100.0	93.7	100.0
Royal Free London NHS Foundation Trust	79.3	72.4	100.0	96.7	97.8	100.0
Royal Surrey County Hospital NHS Foundation Trust	73.0	66.6	100.0	100.0	100.0	100.0
Royal United Hospital Bath NHS Trust	75.0	72.2	100.0	98.6	100.0	98.1
Salisbury NHS Foundation Trust	78.5	61.9	100.0	100.0	100.0	100.0
Sandwell and West Birmingham Hospitals NHS Trust	75.6	64.9	96.5	100.0	100.0	98.2
Sheffield Children's NHS Foundation Trust	75.0	100.0	100.0	100.0	100.0	100.0
Sheffield Teaching Hospitals NHS Foundation Trust	76.0	65.2	91.2	100.0	100.0	99.5
Sherwood Forest Hospitals NHS Foundation Trust	84.0	90.9	100.0	100.0	100.0	96.9
South Tees Hospitals NHS Foundation Trust	73.1	72.8	98.7	100.0	100.0	100.0
South Tyneside NHS Foundation Trust	75.0	86.6	100.0	95.0	100.0	100.0
South Warwickshire NHS Foundation Trust	75.0	69.0	100.0	100.0	100.0	100.0
Southend University Hospital NHS Foundation Trust	100.0	66.6	92.5	100.0	100.0	100.0
Southport and Ormskirk Hospital NHS Trust	96.4	66.6	100.0	100.0	100.0	100.0
St George's University Hospitals NHS Foundation Trust	74.4	52.5	91.8	100.0	100.0	98.5
St Helens and Knowsley Teaching Hospitals NHS Trust	75.0	84.6	89.7	100.0	96.1	97.4
Stockport NHS Foundation Trust	73.0	71.7	100.0	100.0	100.0	100.0

Trust or Health Board	Mother's details	Booking information	Antenatal care	Delivery	Baby's characteristics	Baby's outcome
Surrey and Sussex Healthcare NHS Trust	72.9	61.1	94.4	100.0	100.0	100.0
Tameside Hospital NHS Foundation Trust	75.0	93.7	97.9	100.0	100.0	100.0
Taunton and Somerset NHS Foundation Trust	91.2	71.6	100.0	100.0	100.0	98.3
The Dudley Group NHS Foundation Trust	77.1	81.1	98.5	100.0	95.6	100.0
The Hillingdon Hospitals NHS Foundation Trust	76.5	66.6	100.0	100.0	96.8	97.9
The Ipswich Hospital NHS Trust	75.0	64.8	94.4	98.6	97.2	100.0
The Leeds Teaching Hospitals NHS Trust	82.2	74.4	75.9	99.1	98.3	98.1
The Mid Yorkshire Hospitals NHS Trust	64.3	79.1	97.5	98.7	100.0	99.1
The Newcastle upon Tyne Hospitals NHS Foundation Trust	77.7	59.8	90.7	97.2	99.0	99.3
The Pennine Acute Hospitals NHS Trust	79.6	66.6	95.8	98.4	98.4	96.3
The Portland (HCA Health Care)	90.0	53.3	80.0	100.0	100.0	93.3
The Princess Alexandra Hospital NHS Trust	75.0	64.1	92.3	100.0	96.1	92.3
The Queen Elizabeth Hospital King's Lynn NHS Foundation Trust	56.2	70.8	100.0	100.0	100.0	95.8
The Rotherham NHS Foundation Trust	96.1	71.7	100.0	100.0	100.0	97.4
The Royal Wolverhampton Hospitals NHS Trust	71.8	55.0	95.8	100.0	100.0	100.0
The Shrewsbury and Telford Hospital NHS Trust	75.0	69.3	100.0	100.0	100.0	100.0
Torbay and South Devon NHS Foundation Trust	86.3	72.7	100.0	100.0	100.0	93.9
United Lincolnshire Hospitals NHS Trust	91.3	83.9	97.7	100.0	98.2	91.9
University College London Hospitals NHS Foundation Trust	75.0	64.0	93.8	98.6	100.0	100.0
University Hospital Southampton NHS Foundation Trust	89.8	58.8	93.6	99.4	100.0	96.4
University Hospital of South Manchester NHS Foundation Trust	82.3	64.7	96.0	98.5	100.0	98.0
University Hospitals Coventry and Warwickshire NHS Trust	83.1	81.6	97.2	100.0	97.9	100.0
University Hospitals of Bristol NHS Foundation Trust	74.3	66.6	86.9	97.5	98.7	99.1
University Hospitals of Leicester NHS Trust	79.0	69.7	96.5	98.2	97.7	98.4
University Hospitals of Morecambe Bay NHS Foundation Trust	85.7	71.4	100.0	100.0	96.4	100.0
University Hospitals of North Midlands NHS Trust	78.3	66.6	94.3	99.0	100.0	98.1
Walsall Healthcare NHS Trust	79.8	67.9	100.0	100.0	98.0	98.7
Warrington and Halton Hospitals NHS Foundation Trust	75.0	66.6	100.0	100.0	100.0	94.4
West Hertfordshire Hospitals NHS Trust	70.5	64.7	96.0	100.0	97.0	100.0
West Suffolk NHS Foundation Trust	72.2	74.0	88.8	97.2	100.0	100.0
Western Sussex Hospitals NHS Foundation Trust	80.8	78.4	100.0	100.0	100.0	100.0
Whittington Health	91.6	90.7	96.2	100.0	100.0	96.2
Wirral University Teaching Hospital NHS Foundation Trust	73.8	53.9	92.0	98.8	100.0	100.0
Worcestershire Acute Hospitals NHS Trust	86.2	77.0	100.0	100.0	100.0	100.0
Wrightington, Wigan and Leigh NHS Foundation Trust	86.6	68.8	95.5	100.0	96.6	100.0

Trust or Health Board	Mother's details	Booking information	Antenatal care	Delivery	Baby's characteristics	Baby's outcome
Wye Valley NHS Trust	91.6	70.3	100.0	100.0	100.0	100.0
Yeovil District Hospital NHS Foundation Trust	63.8	77.7	100.0	100.0	100.0	96.2
York Teaching Hospital NHS Foundation Trust	81.0	68.9	100.0	100.0	100.0	96.5
SCOTLAND						
NHS Ayrshire and Arran	83.3	86.1	100.0	100.0	100.0	98.6
NHS Borders	75.0	75.0	100.0	100.0	100.0	95.8
NHS Dumfries and Galloway	75.0	75.0	100.0	100.0	100.0	100.0
NHS Fife	75.0	87.7	100.0	100.0	100.0	98.2
NHS Forth Valley	75.0	94.9	100.0	100.0	100.0	97.4
NHS Grampian	75.6	63.0	86.7	100.0	98.9	100.0
NHS Greater Glasgow and Clyde	82.3	81.2	93.8	100.0	100.0	99.6
NHS Highland	75.0	95.8	100.0	100.0	100.0	95.8
NHS Lanarkshire	75.0	89.7	94.9	100.0	100.0	97.4
NHS Lothian	77.8	80.2	94.4	100.0	95.4	97.5
NHS Orkney	100.0	100.0	100.0	100.0	100.0	100.0
NHS Tayside	79.2	74.1	96.3	100.0	100.0	100.0
WALES						
Abertawe Bro Morgannwg University Health Board	73.5	59.9	93.9	98.5	100.0	97.3
Aneurin Bevan Health Board	75.0	72.2	97.8	100.0	100.0	100.0
Betsi Cadwaladr University Health Board	70.2	84.9	100.0	100.0	100.0	98.9
Cardiff and Vale University Health Board	69.4	54.9	89.5	96.8	99.1	96.9
Cwm Taf Health Board	54.8	69.2	93.6	96.2	94.2	100.0
Hywel Dda Health Board	72.5	66.7	100.0	100.0	100.0	96.7
NORTHERN IRELAND						
Belfast Health and Social Care Trust	77.7	64.9	94.2	99.7	100.0	98.2
Northern Health and Social Care Trust	80.0	64.4	100.0	100.0	100.0	100.0
South Eastern Health and Social Care Trust	79.4	64.7	100.0	98.5	100.0	100.0
Southern Health and Social Care Trust	82.6	63.6	94.9	100.0	100.0	97.0
Western Health and Social Care Trust	75.0	61.4	91.2	96.1	100.0	100.0
CROWN DEPENDENCIES						
Isle of Man Department of Health	83.3	100.0	100.0	100.0	100.0	100.0
States of Guernsey Health and Social Services	62.5	83.3	100.0	100.0	100.0	100.0
States of Jersey Health and Social Services	50.0	66.7	100.0	100.0	100.0	100.0

A2.7 Statistical methods to calculate stabilised & adjusted mortality rates

Mortality estimates for organisations responsible for population based care commissioning and for Local Government areas based on postcode of mother's residence at time of delivery

The stabilised & adjusted mortality rate for each organisation (m_j) is calculated by multiplying the appropriate observed overall mortality rate for the UK (M) by an organisation-specific standardised mortality rate (SMR_j) calculated from the data, i.e.:

$$m_j = M \times SMR_j$$

where m_j is the estimated stabilised & adjusted mortality rate for organisation j

M is the observed overall mortality rate for the UK

SMR_j is the estimated SMR for organisation j : $SMR_j = \frac{(\text{No. observed deaths})}{(\text{No. expected deaths})}$

The SMR is estimated using a multilevel logistic regression model:

$$\text{logit}[P_{ij}(Y_{ij} = 1 | \mathbf{x}_{ij})] = \alpha + \beta \mathbf{x}_{ij} + \gamma_j$$

where Y_{ij} is the indicator variable of death for the i^{th} baby in the j^{th} organisation: $Y_{ij}=1$ if a death; 0 otherwise

\mathbf{x}_{ij} is the vector of risk adjustment factors for the i^{th} baby in the j^{th} organisation

γ_j is the random term representing organisation j : $\gamma_j \sim \text{Normal}(0, \sigma^2)$

A multilevel model is used as it can accommodate the hierarchical structure of the data through the random term; that is, births clustered within organisations. These models also allow the calculation of stabilised (also known as 'shrunken' or 'smoothed') estimates of the organisation-specific terms, which reduce the likelihood of organisations being falsely identified as outliers by chance alone.

Various approaches to calculating an SMR from a multilevel logistic model have been proposed [3]. The method used for the MBRRACE-UK report "... is determined by dividing the smoothed, risk-adjusted, provider-specific estimate of mortality by the estimate of expected mortality obtained using the average intercept for all ... providers" [4]. In this approach, the observed number of deaths is replaced by a model-based predicted number reflecting sampling variation in the observed deaths; that is, a *stabilised* observed number of deaths is estimated for each organisation. Hence, the SMR is the ratio of the stabilised number of deaths to the deaths that would be expected if the organisation's patients were from an 'average' organisation:

$$SMR_j = \frac{\sum_{i=1}^{n_j} (1 + \exp[-\alpha - \beta \mathbf{x}_{ij} - \gamma_j])^{-1}}{\sum_{i=1}^{n_j} (1 + \exp[-\alpha - \beta \mathbf{x}_{ij}])^{-1}}$$

Therefore:

$$m_j = M \times \frac{\sum_{i=1}^{n_j} (1 + \exp[-\alpha - \beta \mathbf{x}_{ij} - \gamma_j])^{-1}}{\sum_{i=1}^{n_j} (1 + \exp[-\alpha - \beta \mathbf{x}_{ij}])^{-1}}$$

Mortality estimates for organisations based on place of birth

The approach taken for organisations based on place of birth (Trusts and Health Boards) is similar to that described above except that the organisations are grouped hierarchically into one of the following comparator groups:

1. Trusts and Health Boards with full neonatal intensive care facilities which also routinely manage babies identified antenatally as having a congenital anomaly likely to need neonatal surgery.
2. Other Trusts and Health Boards with full neonatal intensive care facilities.
3. Trusts and Health Boards with $\geq 4,000$ deliveries a year and without full neonatal intensive care facilities.
4. Trusts and Health Boards with 2,000-3,999 deliveries a year and without full neonatal intensive care facilities.
5. Trusts and Health Boards with $< 2,000$ deliveries a year and without full neonatal intensive care facilities.

While it is not possible to adjust for all potential risk factors, the adjustment measures and grouping of Trusts and Health Boards allow for more appropriate comparison based on the risk profile of the population of women served.

In this case the multilevel logistic regression model used is:

$$\text{logit}\left[P_{ij}(Y_{ij} = 1 | \mathbf{x}_{ij})\right] = \alpha + \beta \mathbf{x}_{ij} + \varepsilon_j + \delta_j$$

where Y_{ij} is the indicator variable of death for the i^{th} baby in the j^{th} organisation: $Y_{ij}=1$ if a death; 0 otherwise

\mathbf{x}_{ij} is the vector of risk-adjustment factors for the i^{th} baby in the j^{th} organisation

ε_j is the indicator variable for the comparator group of the j^{th} organisation

δ_j is the random term representing organisation j : $\delta_j \sim \text{Normal}(0, \sigma^2)$

Then:

$$SMR_j = \frac{\sum_{i=1}^{n_j} (1 + \exp[-\alpha - \beta \mathbf{x}_{ij} - \varepsilon_j - \delta_j])^{-1}}{\sum_{i=1}^{n_j} (1 + \exp[-\alpha - \beta \mathbf{x}_{ij} - \varepsilon_j])^{-1}}$$

and:

$$m_j = M \times \frac{\sum_{i=1}^{n_j} (1 + \exp[-\alpha - \beta \mathbf{x}_{ij} - \varepsilon_j - \delta_j])^{-1}}{\sum_{i=1}^{n_j} (1 + \exp[-\alpha - \beta \mathbf{x}_{ij} - \varepsilon_j])^{-1}}$$

95% confidence intervals

The reported 95% confidence intervals for the stabilised & adjusted mortality rate are obtained through bootstrap methods [5]:

1. J organisations are sampled with replacement (where J is the total number of organisations).
2. The multilevel model is estimated for the sample, keeping each appearance of an organisation distinct if it is sampled more than once.
3. The estimated value, and prediction error, of the random term is obtained for each organisation: $\hat{\gamma}_j$ and $error(\gamma_j)$ - if an organisation is sampled more than once then a single set of values is selected at random.
4. The bootstrap estimates for the fixed terms are noted (α^* and β^*).
5. A new value (γ_j^*) for the organisation-specific random term is sampled, where $\gamma_j^* \sim N(\hat{\gamma}_j, error[\gamma_j])$.
6. The bootstrap stabilised & adjusted mortality rate (m_j^*) is obtained by substituting γ_j^* for $\hat{\gamma}_j$ giving
$$m_j^* = M \times \frac{\sum_{i=1}^{n_j} (1 + \exp[-\alpha^* - \beta^* \mathbf{x}_{ij} - \gamma_j^*])^{-1}}{\sum_{i=1}^{n_j} (1 + \exp[-\alpha^* - \beta^* \mathbf{x}_{ij}])^{-1}}.$$
7. This is repeated 1,500 times, giving approximately 1,000 values for the bootstrap stabilised & adjusted mortality rate for each organisation since organisations are not necessarily included in each bootstrap sample.
8. The lower and upper limits of the 95% confidence interval are obtained for each organisation from the 2.5th and 97.5th percentiles respectively of the distribution of the bootstrap stabilised & adjusted mortality rates.

Probability of falling above a benchmark

The statistical methodology used allows the calculation of empirical Bayes posterior probabilities to estimate the probability that the underlying mortality rate for an organisation falls above (or below) a specified benchmark; for example, it would be possible to report the probability that the underlying stabilised & adjusted mortality rate for organisation j is greater than 6 per 1,000 births ($m_j > 6.0$).

In this report, organisations have been identified when the probability that they fall above, or below, a specified benchmark is greater than 0.5; that is, 'it is more likely than not' that their underlying mortality rate falls outside the benchmark.

However, with the specification of a set of nationally agreed benchmarks covering all types of perinatal death, this methodology can be used to explicitly report the probability that organisations are performing better than these agreed benchmarks. This approach will be explored in later MBRRACE-UK reports.

A2.8 Risk-adjustment model

The multilevel logistic regression model outlined in the previous section includes factors to adjust for differences in key factors which are known to increase the risk of stillbirth and neonatal mortality. The factors which can be included in the model are limited to those that are routinely collected for all births across the whole UK. For this report the risk-adjustment factors included in the statistical model were:

- **mother's age**, categorised as <20 years, 20-24 years, 25-29 years, 30-34 years, 35-39 years, ≥40 years;
- **socio-economic deprivation**, based on mother's residence, measured using the Children in Low Income Families Local Measure and categorised into quintiles to ensure an (approximately) equal number of total births in each quintile;
- **baby's ethnicity**, categorised as White, mixed or multiple ethnicity, Asian or Asian British, Black or Black British, other;
- **baby's sex**, categorised as male, non-male;
- **multiple birth**, categorised as singleton birth, multiple birth;
- **gestational age at birth**, categorised as 24⁺⁰ to 27⁺⁶ weeks, 28⁺⁰ to 31⁺⁶ weeks, 32⁺⁰ to 33⁺⁶ weeks, 34⁺⁰ to 36⁺⁶ weeks, 37⁺⁰ to 41⁺⁶ weeks, ≥42⁺⁰ weeks (included for neonatal death rates only, as gestational age at birth may potentially be influenced by the quality of obstetric care).

Missing data

Where information was unavailable for the risk-adjustment factors because it was missing from the routine data source, in order to allow all appropriate births to be included in the analyses the missing values were assumed to fall into the following categories:

- **mothers age** - 30 to 34 years (for 0.9% of births);
- **socio-economic deprivation** - middle quintile (1.6%);
- **baby's ethnicity** - white (2.2%);
- **baby's sex** - male (<0.1%);
- **multiple birth**- singleton (<0.8%);
- **gestational age at birth** - 37⁺⁰ to 41⁺⁶ weeks (<1.3%).

The percentages of missing data include data from births in Scotland missing due to the unavailability to MBRRACE-UK of SMR02 records matched to registered births (under 1% of all births in the UK).

References

1. Royal College of Obstetricians and Gynaecologists. Registration of Stillbirths and Certification for Pregnancy Loss Before 24 Weeks of Gestation (Good Practice No. 4). Available online at: <https://www.rcog.org.uk/en/guidelines-research-services/guidelines/good-practice-4/>. RCOG: 2005.
2. Royal College of Obstetricians and Gynaecologists. Late Intrauterine Fetal Death and Stillbirth (Green-top Guideline No. 55). Available online at: <https://www.rcog.org.uk/en/guidelines-research-services/guidelines/gtg55/>. RCOG: 2010.
3. Mohammed MA, Manktelow BN, Hofer TP. Comparison of four methods for deriving hospital standardised mortality ratios from a single hierarchical logistic regression model. *Statistical Methods in Medical Research* 2012: Published online 6 November 2012.
4. Shahian DM, Torchiana DF, Shemin RJ, Rawn JD, Normand S-LT. Massachusetts Cardiac Surgery Report Card: Implications of Statistical Methodology. *The Annals of Thoracic Surgery* 2005; 80(6): 2106-2113.
5. Ash AS, Fienberg SE, Louis TA, Normand S-LT, Stukel TA, Utts J. Statistical issues in assessing hospital performance. *Quantitative Health Sciences Publications and Presentations* 2012: Paper 1114.



A3. Further rates of mortality for organisations

A3.1 Rates of mortality by Neonatal Network in the United Kingdom

Revised 24 May 2016

Figure 26: Crude stillbirth rates by Neonatal Network based on place of birth: United Kingdom, for births in 2014

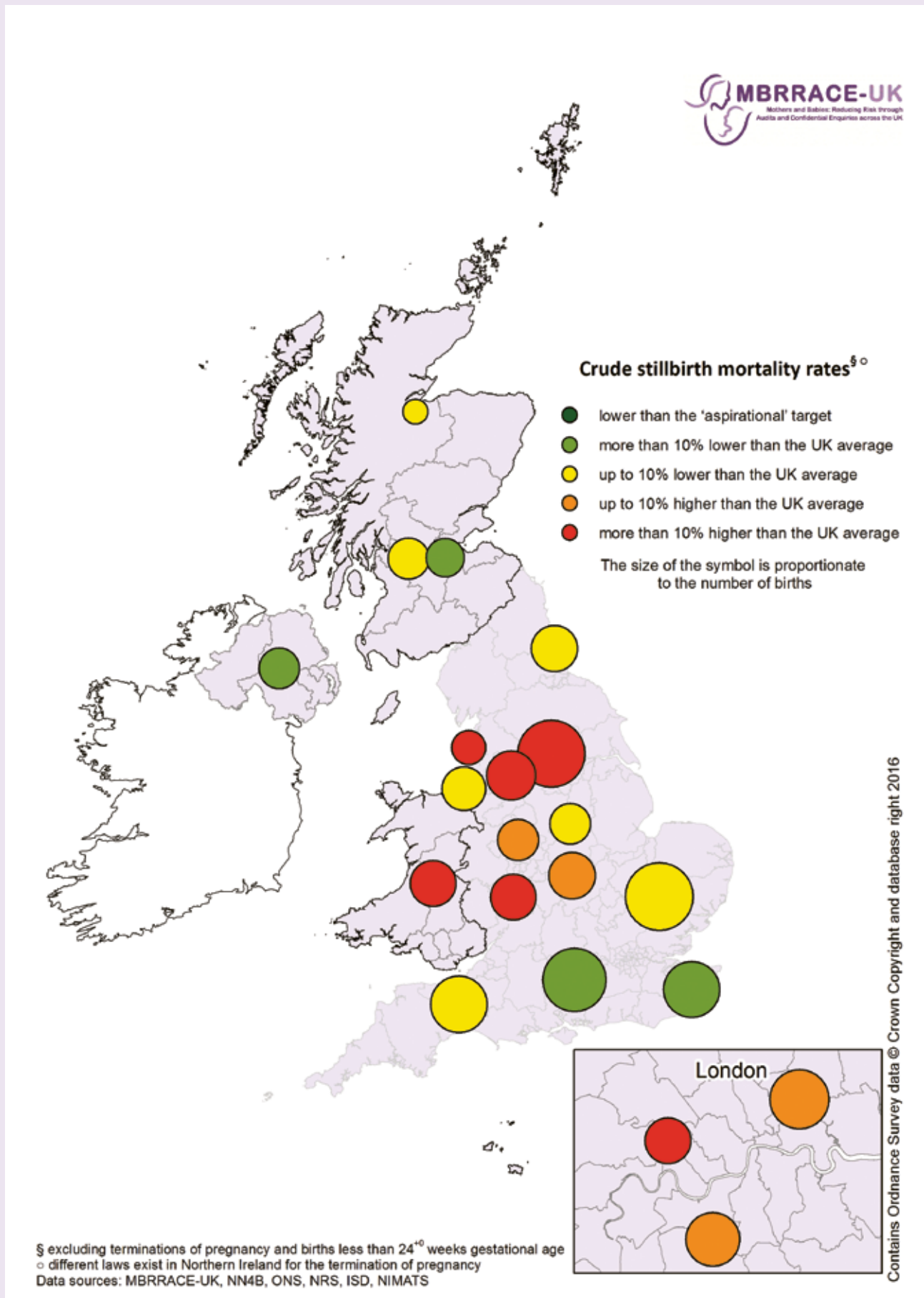


Figure 27: Stabilised & adjusted stillbirth rates by Neonatal Network based on place of birth: United Kingdom, for births in 2014

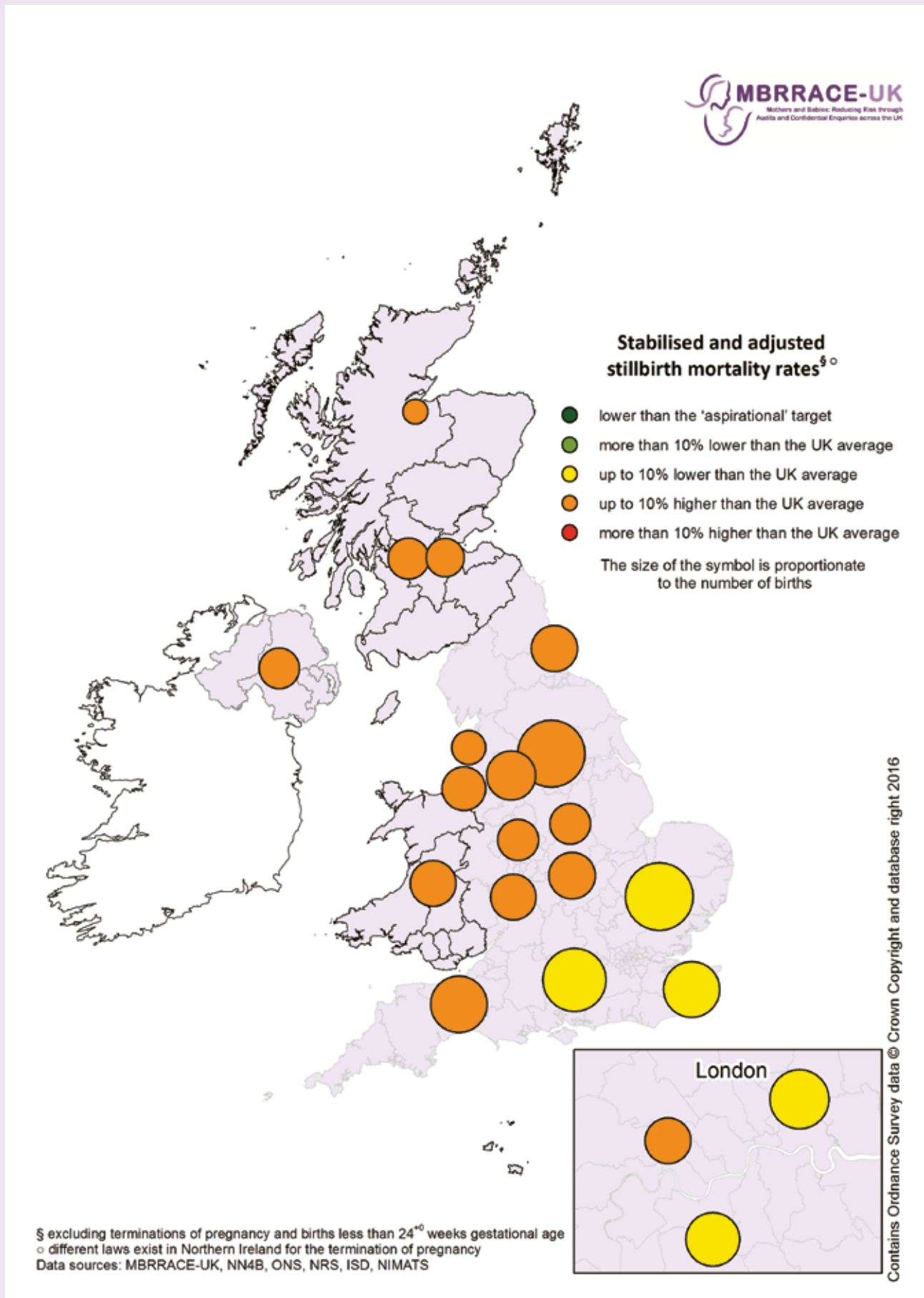


Figure 28: Crude neonatal mortality rates by Neonatal Network based on place of birth: United Kingdom, for births in 2014

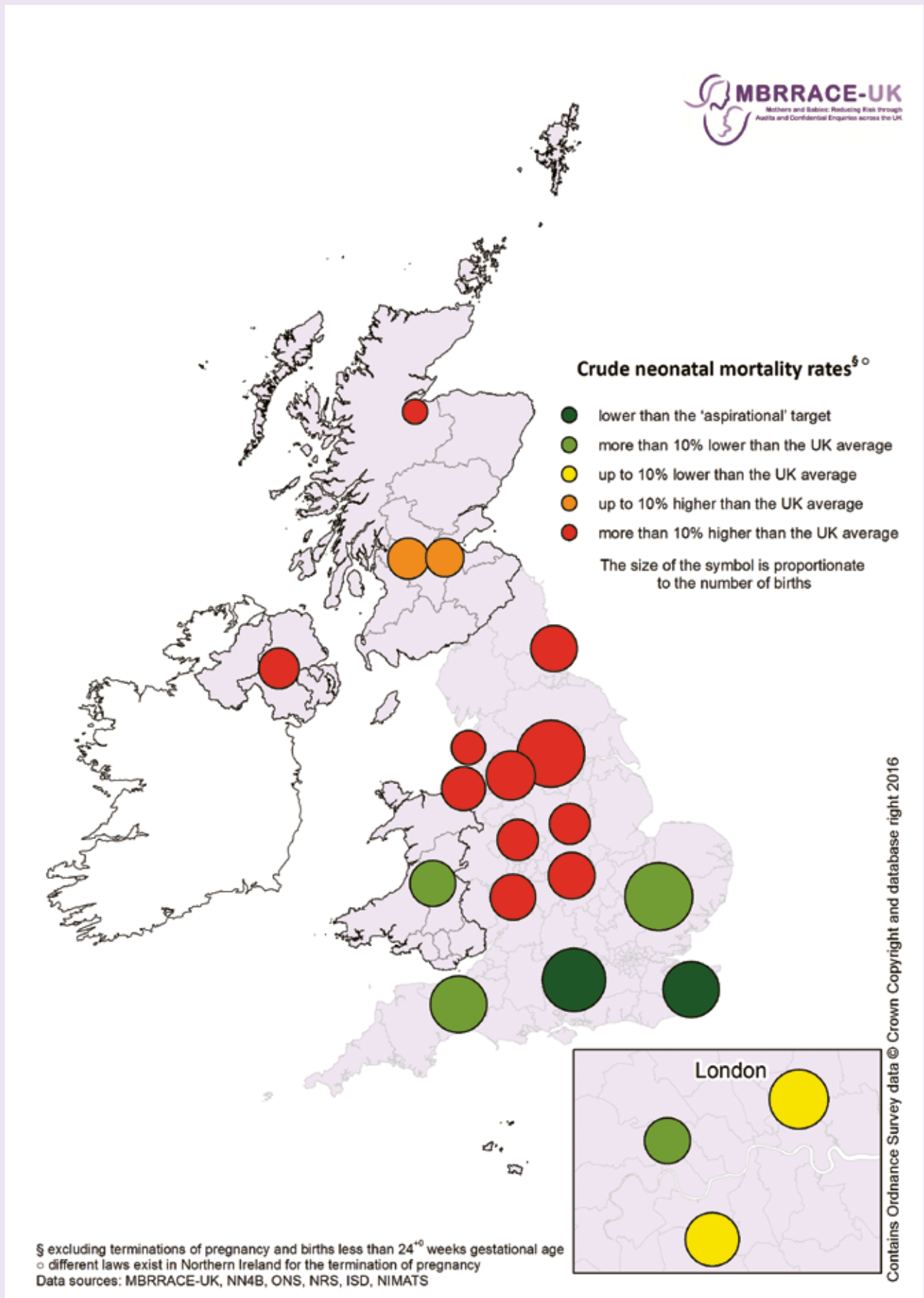


Figure 29: Stabilised & adjusted neonatal mortality rates by Neonatal Network based on place of birth: United Kingdom, for births in 2014

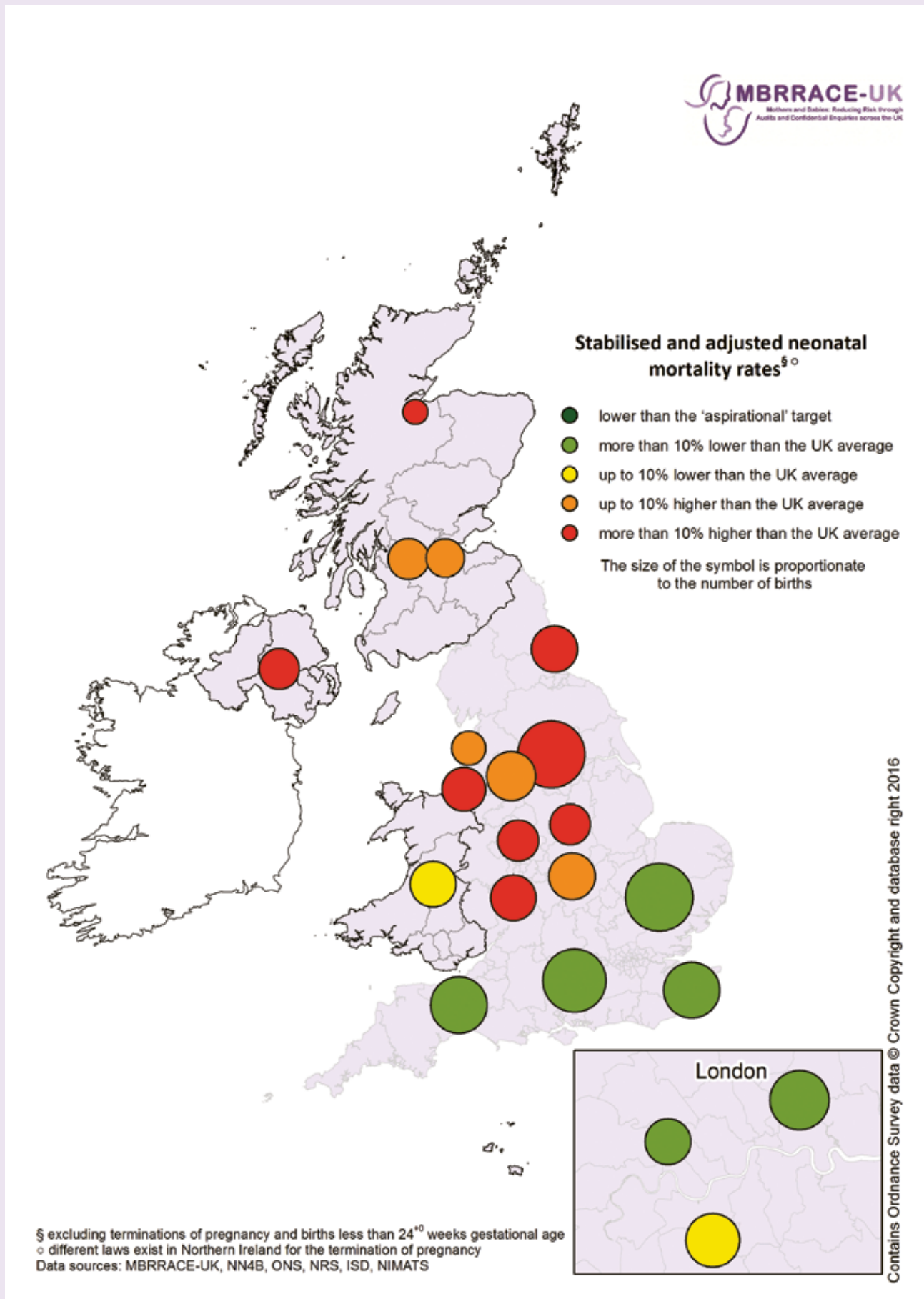


Figure 30: Crude extended perinatal mortality rates by Neonatal Network based on place of birth: United Kingdom, for births in 2014

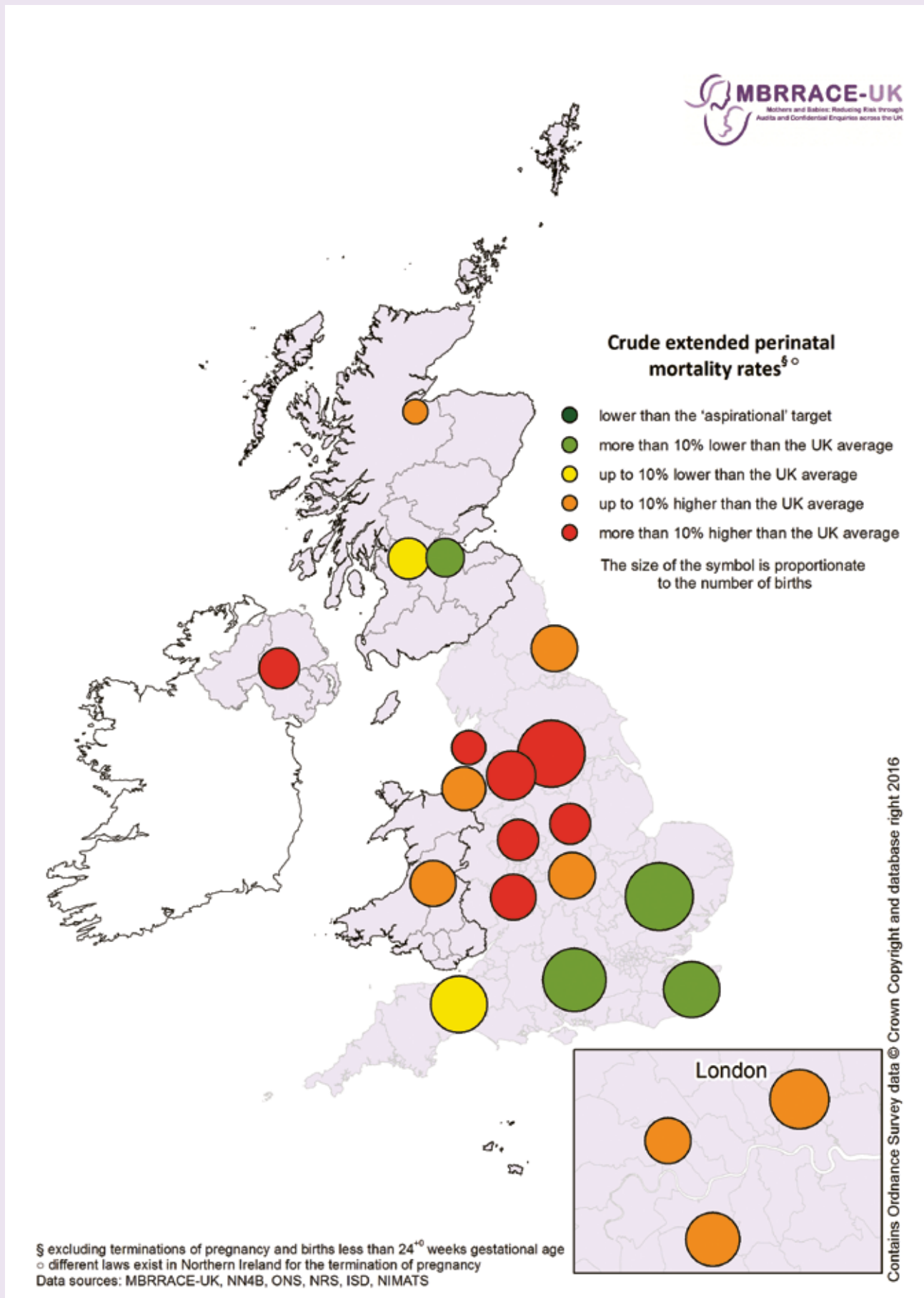


Figure 31: Stabilised & adjusted extended perinatal mortality rates by Neonatal Network based on place of birth: United Kingdom, for births in 2014

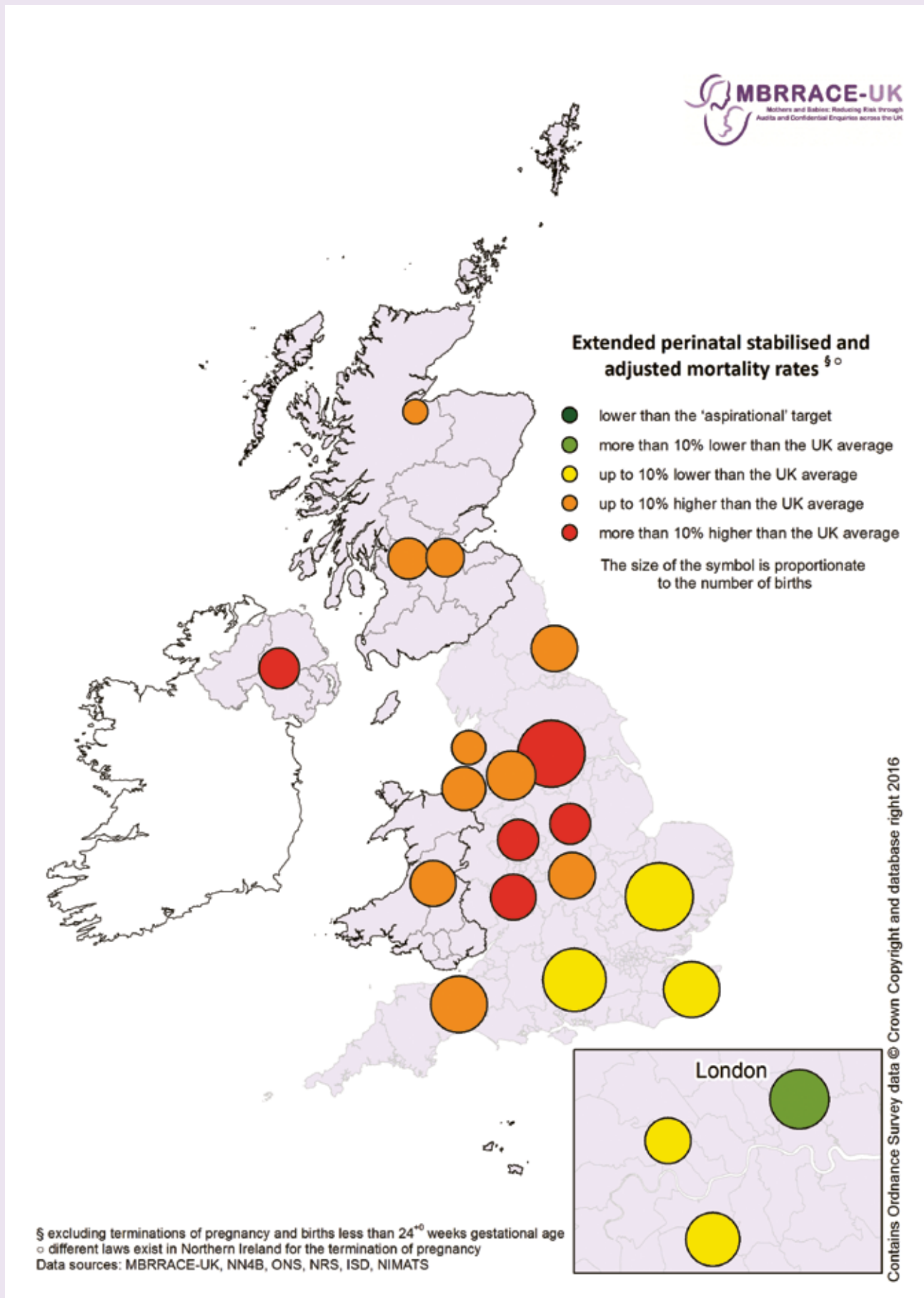


Table 28: Crude and stabilised & adjusted stillbirth, neonatal, and extended perinatal mortality rates by Neonatal Network based on place of birth: United Kingdom, for births in 2014

Neonatal Network	Total births [§]	Mortality rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
ENGLAND								
Central	32,241	4.22	4.22 (3.89 to 4.65)	1.96	1.94 (1.45 to 2.45)	6.17	6.12 (5.32 to 6.90)	●
East of England	69,486	3.80	4.15 (3.81 to 4.56)	1.31	1.47 (1.14 to 1.82)	5.11	5.57 (4.90 to 6.15)	●
North Central and East London	53,230	4.49	4.05 (3.63 to 4.67)	1.64	1.49 (1.15 to 1.89)	6.12	5.37 (4.67 to 6.15)	●
North West (Cheshire and Merseyside)	28,753	4.07	4.25 (3.87 to 4.66)	1.96	1.96 (1.47 to 2.49)	6.02	6.24 (5.39 to 7.02)	●
North West (Greater Manchester)	37,153	4.87	4.34 (3.83 to 4.87)	1.97	1.86 (1.43 to 2.32)	6.84	6.36 (5.57 to 7.20)	●
North West (Lancashire and South Cumbria)	17,334	4.62	4.29 (3.89 to 4.80)	1.97	1.95 (1.39 to 2.52)	6.58	6.38 (5.49 to 7.26)	●
North West London	31,961	4.85	4.19 (3.84 to 4.64)	1.35	1.38 (1.01 to 1.84)	6.20	5.58 (4.82 to 6.33)	●
Northern	32,780	3.87	4.19 (3.85 to 4.60)	2.08	2.03 (1.53 to 2.55)	5.95	6.13 (5.32 to 6.85)	●
South East Coast	48,122	3.70	4.15 (3.79 to 4.60)	1.21	1.40 (1.04 to 1.81)	4.90	5.48 (4.77 to 6.17)	●
South London	44,471	4.25	4.07 (3.66 to 4.64)	1.72	1.64 (1.24 to 2.11)	5.96	5.53 (4.87 to 6.30)	●
South West	48,508	4.12	4.32 (3.89 to 4.87)	1.32	1.51 (1.13 to 1.93)	5.44	5.99 (5.19 to 6.67)	●
Southern West Midlands	31,221	5.03	4.31 (3.85 to 4.76)	2.74	2.34 (1.78 to 2.96)	7.75	6.71 (5.86 to 7.53)	●
Staffordshire, Shropshire and Black Country	25,487	4.51	4.28 (3.91 to 4.75)	2.40	2.23 (1.64 to 2.79)	6.91	6.54 (5.59 to 7.36)	●
Thames Valley and Wessex	60,795	3.77	4.13 (3.75 to 4.59)	1.27	1.43 (1.10 to 1.83)	5.03	5.48 (4.78 to 6.12)	●
Trent	25,041	4.03	4.22 (3.86 to 4.64)	2.69	2.47 (1.82 to 3.12)	6.71	6.54 (5.62 to 7.39)	●
Yorkshire and Humber	67,563	4.83	4.46 (3.92 to 5.04)	2.08	2.03 (1.60 to 2.52)	6.90	6.71 (5.91 to 7.39)	●
SCOTLAND								
North of Scotland	9,262	4.10	4.27 (3.90 to 4.73)	2.06	2.03 (1.39 to 2.78)	6.15	6.36 (5.36 to 7.33)	●
South East Scotland and Tayside	22,197	3.38	4.17 (3.79 to 4.57)	1.81	1.92 (1.41 to 2.51)	5.18	5.94 (5.07 to 6.77)	●
West of Scotland	25,350	3.83	4.22 (3.86 to 4.64)	1.82	1.90 (1.41 to 2.43)	5.64	6.10 (5.29 to 6.86)	●

Neonatal Network	Total births [§]	Mortality rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [‡]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
WALES								
Wales	31,982	4.66	4.39 (3.84 to 4.99)	1.60	1.71 (1.30 to 2.18)	6.25	6.41 (5.57 to 7.16)	●
NORTHERN IRELAND[°]								
Northern Ireland [°]	24,647	3.73	4.21 (3.85 to 4.64)	2.85	2.70 (2.02 to 3.47)	6.57	6.70 (5.77 to 7.59)	●

[†] per 1,000 total births

[‡] per 1,000 live births

[§] excluding terminations of pregnancy and births <24⁺⁰ weeks gestational age

[°] different laws exist in Northern Ireland for the termination of pregnancy

[#] colours represent variation from UK average extended perinatal mortality rate

Data sources: MBRRACE-UK, NN4B, ONS, NRS, ISD, NIMATS



A3.2 Rates of mortality by Local Authority based on postcode of mother's residence at time of delivery

Figure 32: Crude stillbirth rates by Local Authority based on postcode of mother's residence at time of delivery: United Kingdom and Crown Dependencies, for births in 2014

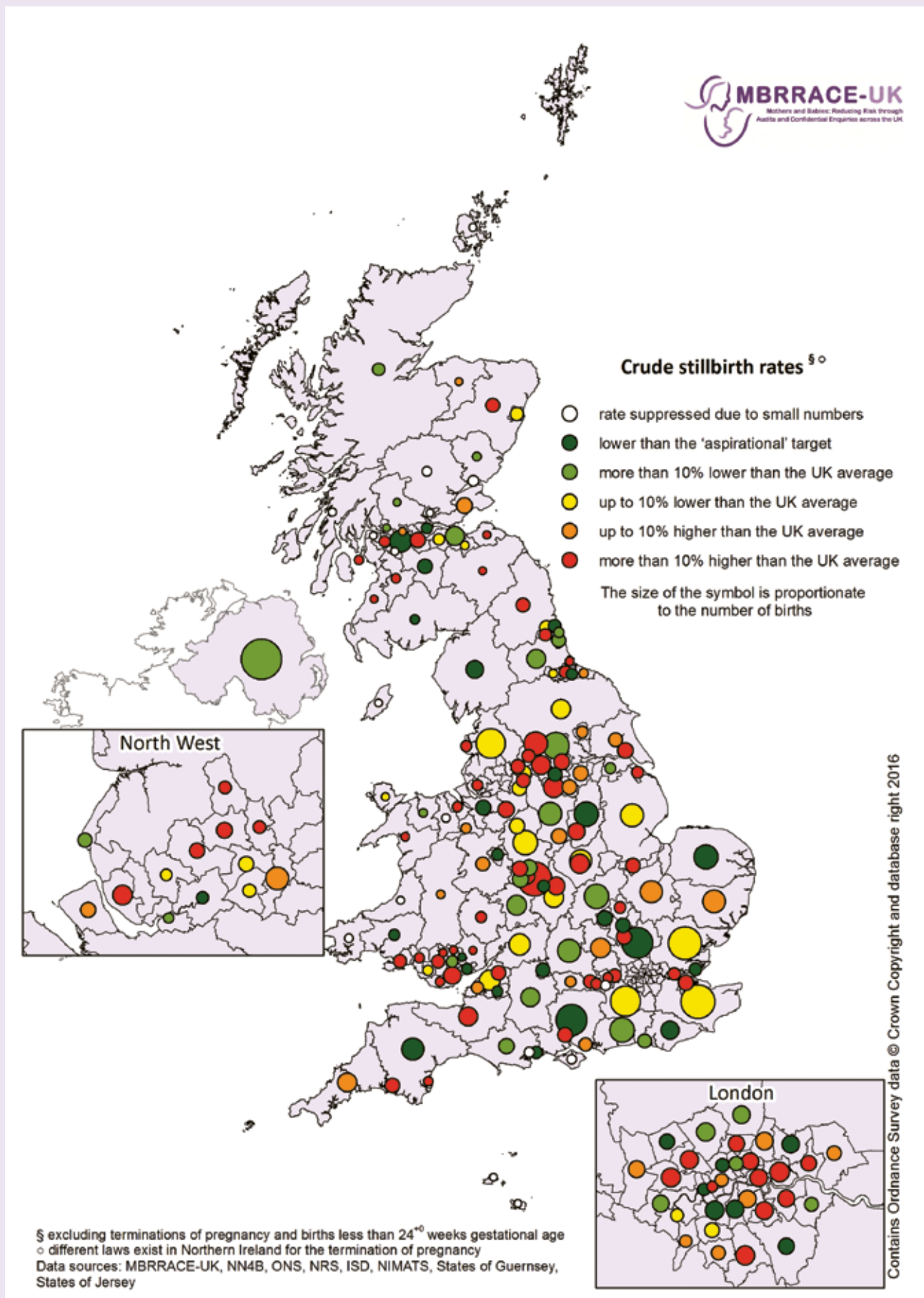


Figure 33: Stabilised & adjusted stillbirth rates by Local Authority based on postcode of mother's residence at time of delivery: United Kingdom and Crown Dependencies, for births in 2014

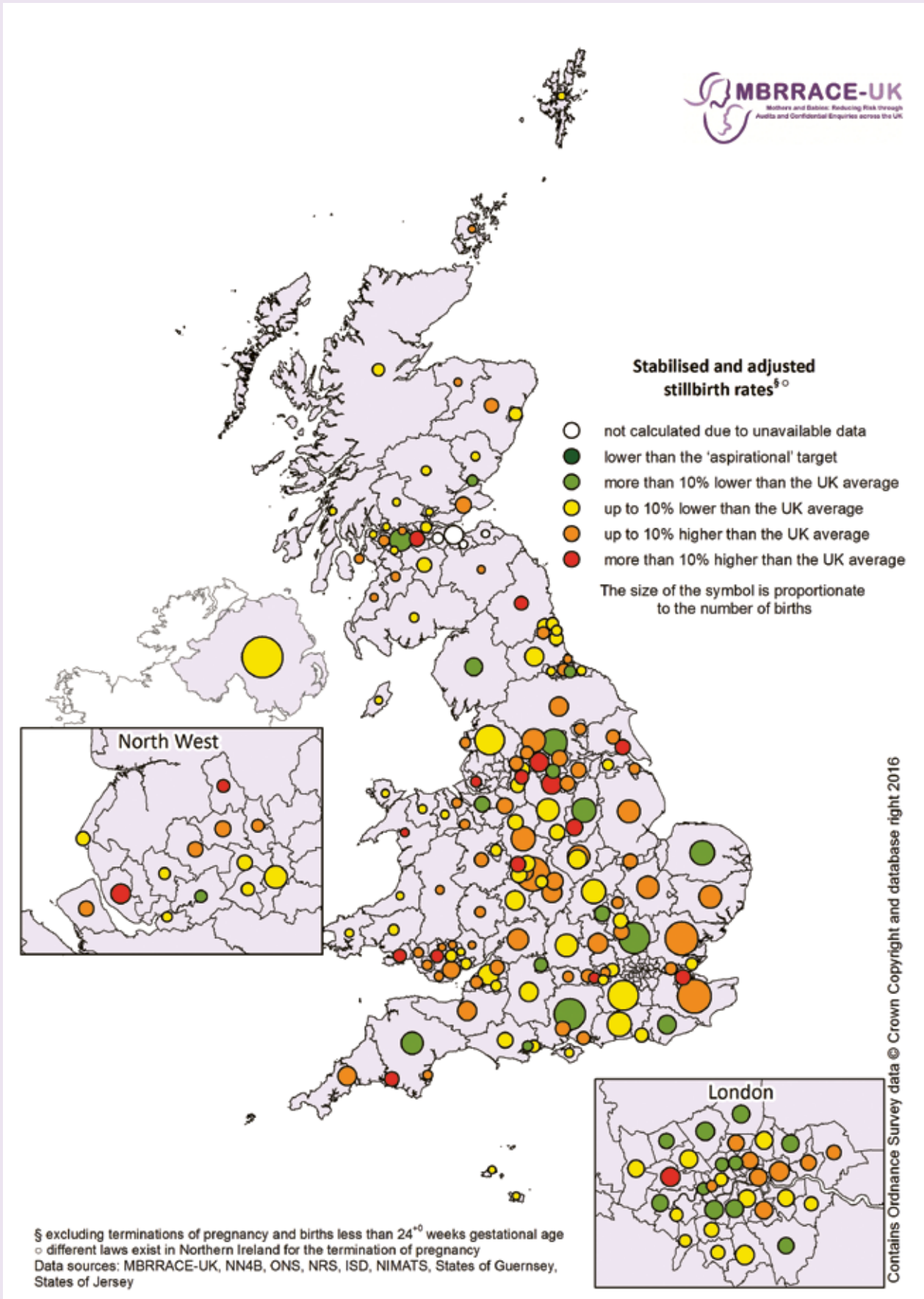


Figure 34: Crude neonatal mortality rates by Local Authority based on postcode of mother's residence at time of delivery: United Kingdom and Crown Dependencies, for births in 2014

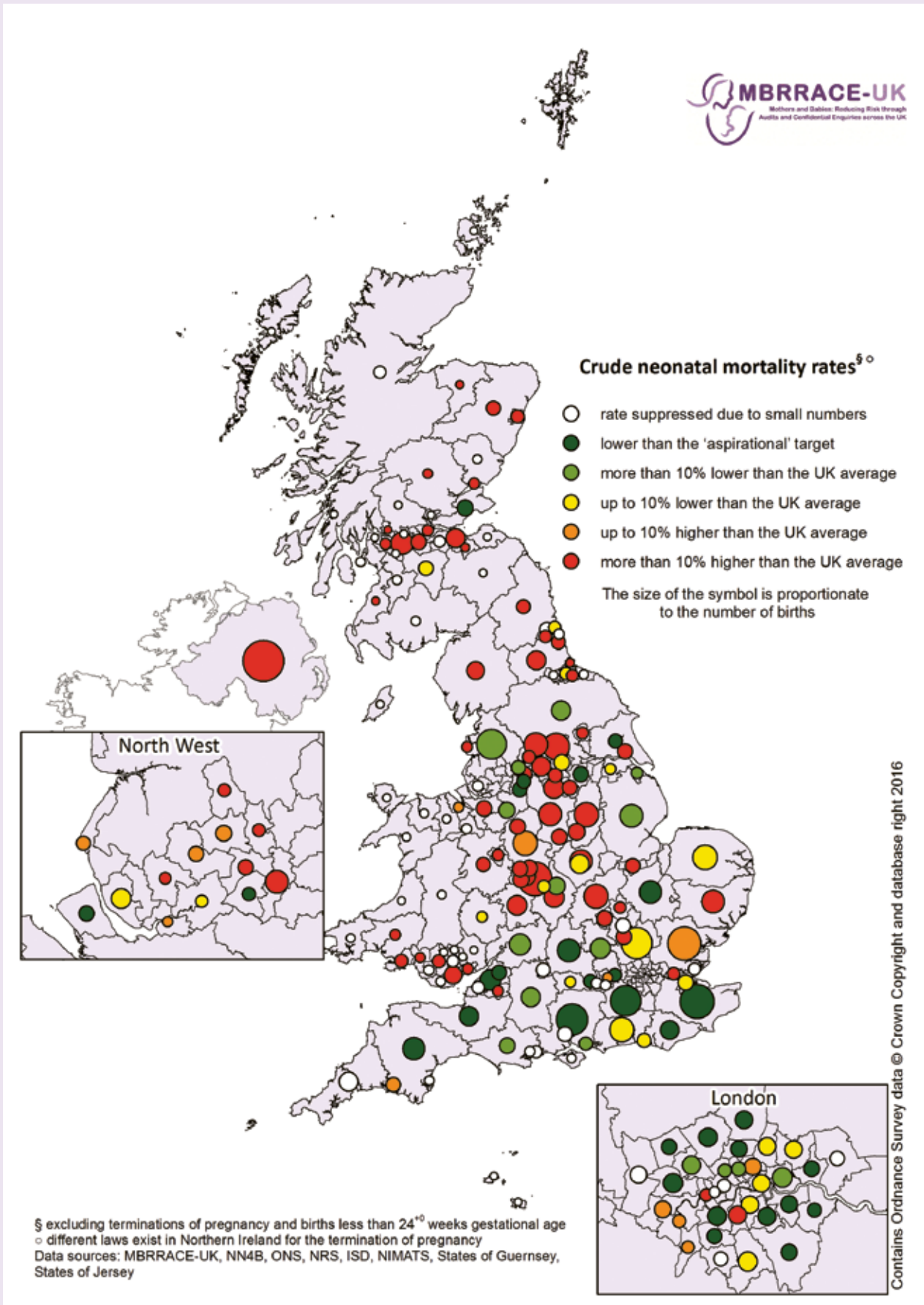


Figure 35: Stabilised & adjusted neonatal mortality rates by Local Authority based on postcode of mother's residence at time of delivery: United Kingdom and Crown Dependencies, for births in 2014

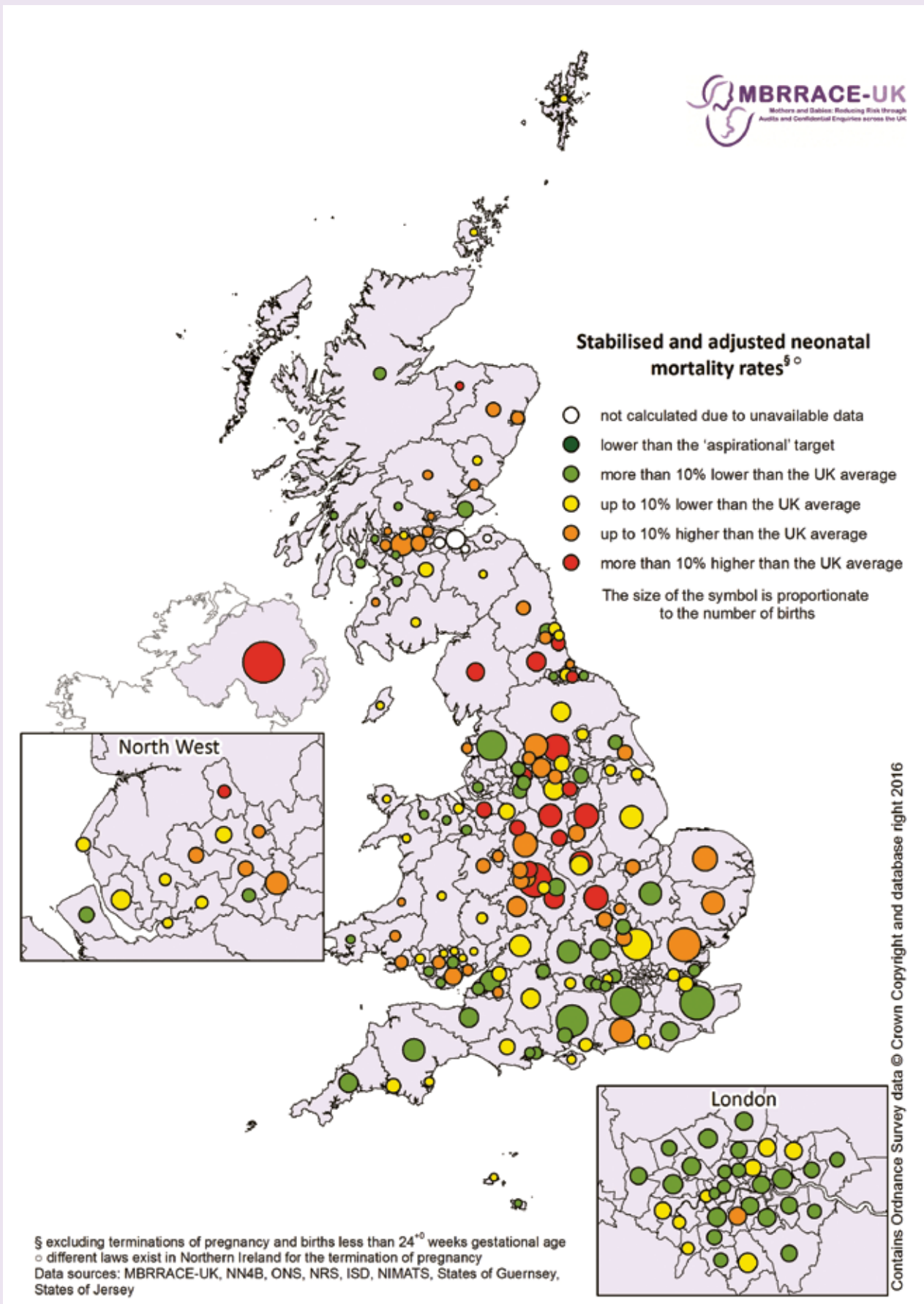


Figure 36: Crude extended perinatal mortality rates by Local Authority based on postcode of mother's residence at time of delivery: United Kingdom and Crown Dependencies, for births in 2014

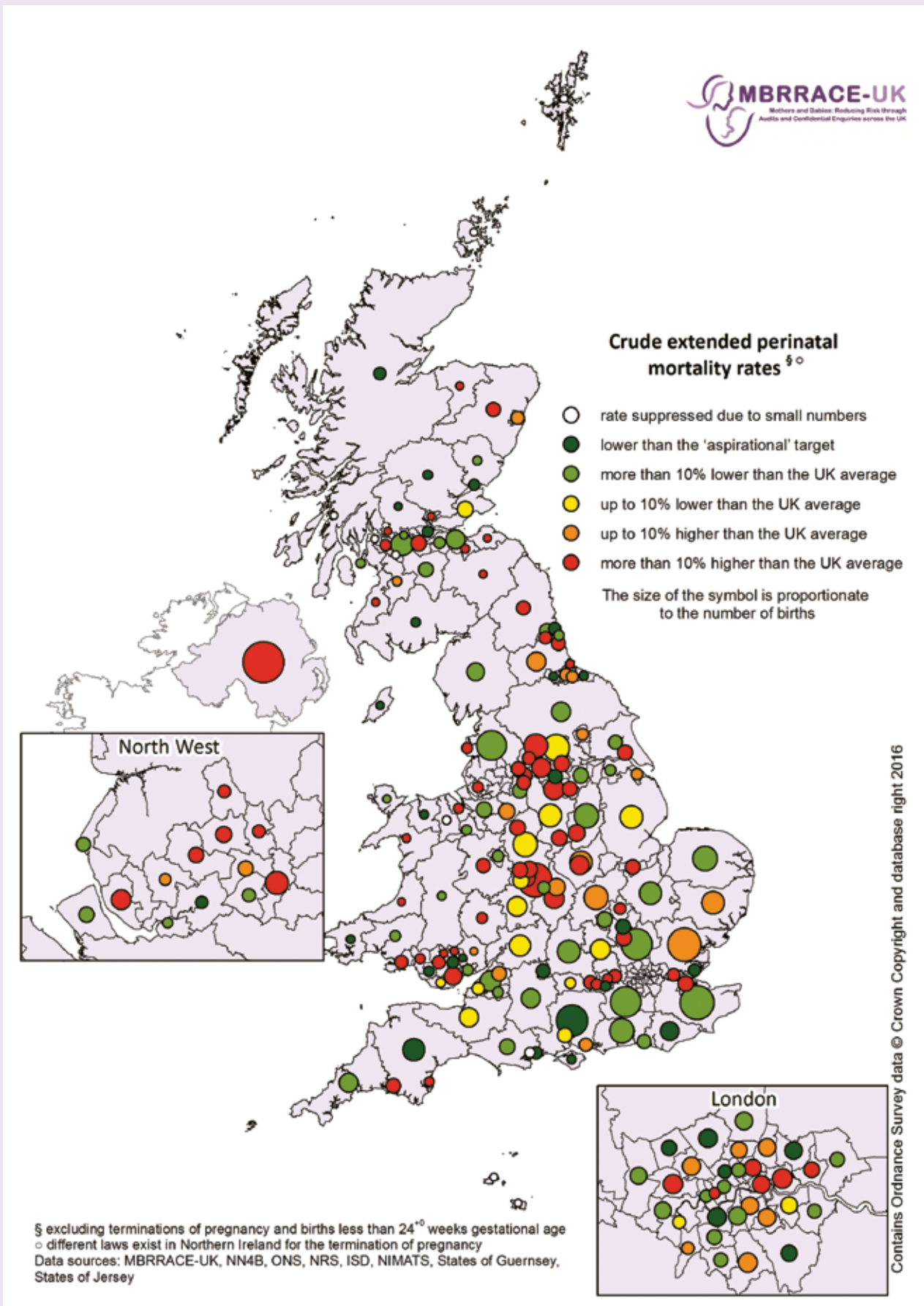


Figure 37: Stabilised & adjusted extended perinatal mortality rates by Local Authority based on postcode of mother's residence at time of delivery: United Kingdom and Crown Dependencies, for births in 2014

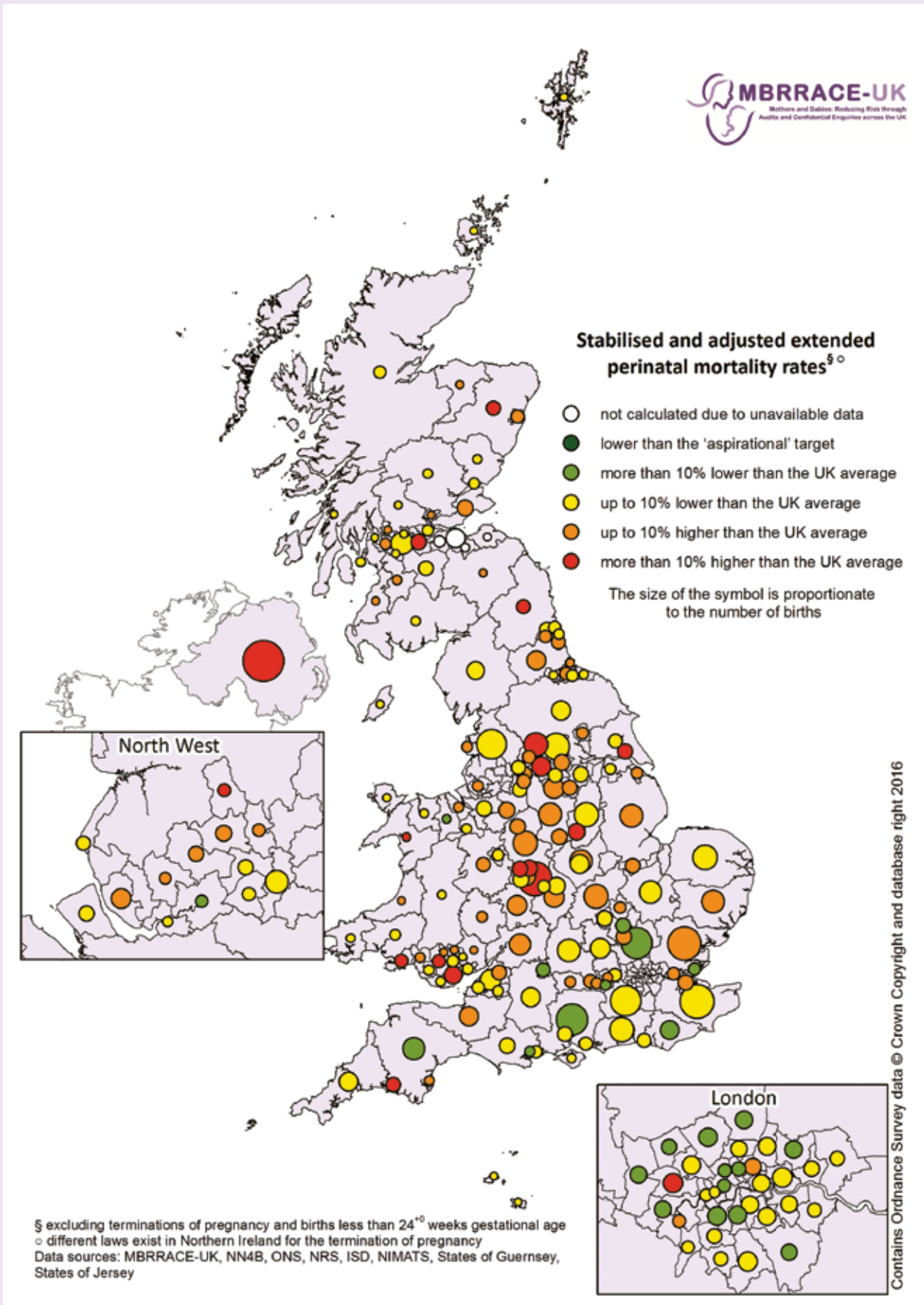


Table 29: Crude and stabilised & adjusted stillbirth, neonatal, and extended perinatal mortality rates by Local Authority based on postcode of mother's residence at time of delivery: United Kingdom and Crown Dependencies, for births in 2014

Local Authority	Total births [§]	Rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [‡]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
ENGLAND								
Barking and Dagenham	3,593	5.84	4.25 (3.36 to 5.55)	1.12	1.47 (1.00 to 2.33)	6.96	5.73 (4.64 to 7.22)	●
Barnet	5,268	3.04	3.69 (2.92 to 4.88)	0.76	1.39 (0.95 to 2.18)	3.80	5.01 (3.96 to 6.40)	●
Barnsley	2,796	1.79	3.67 (2.73 to 4.86)	2.15	1.80 (1.24 to 3.09)	3.93	5.45 (4.27 to 7.19)	●
Bath and North East Somerset	1,732	2.31	3.94 (2.93 to 5.36)	2.89	1.90 (1.28 to 3.28)	5.20	5.87 (4.64 to 7.63)	●
Bedford	2,159	5.56	4.38 (3.34 to 5.77)	2.79	1.90 (1.34 to 3.10)	8.34	6.38 (4.89 to 8.43)	●
Bexley	3,052	3.60	3.92 (3.03 to 5.12)	0.99	1.52 (1.01 to 2.37)	4.59	5.42 (4.26 to 6.96)	●
Birmingham	17,002	5.59	4.50 (3.80 to 5.59)	2.66	1.97 (1.54 to 2.83)	8.23	6.58 (5.69 to 7.97)	●
Blackburn with Darwen	2,229	8.97	4.92 (3.74 to 6.80)	3.62	2.03 (1.40 to 3.33)	12.56	7.16 (5.45 to 9.49)	●
Blackpool	1,834	6.00	4.44 (3.37 to 5.87)	3.29	1.95 (1.32 to 3.31)	9.27	6.52 (4.98 to 8.78)	●
Bolton	3,788	5.81	4.50 (3.49 to 5.97)	1.86	1.69 (1.22 to 2.71)	7.66	6.27 (5.06 to 7.96)	●
Bournemouth	2,230	*	3.92 (2.89 to 5.15)	*	1.50 (0.96 to 2.46)	3.14	5.39 (4.27 to 7.20)	●
Bracknell Forest	1,513	*	3.81 (2.80 to 5.01)	*	1.58 (1.05 to 2.64)	1.98	5.36 (4.05 to 6.97)	●
Bradford	8,144	5.77	4.56 (3.69 to 5.78)	2.47	1.93 (1.42 to 2.98)	8.23	6.56 (5.49 to 8.07)	●
Brent	5,107	4.90	4.02 (3.20 to 5.16)	1.57	1.61 (1.18 to 2.49)	6.46	5.62 (4.62 to 7.09)	●
Brighton and Hove	2,990	3.01	3.88 (2.98 to 5.10)	1.68	1.67 (1.15 to 2.74)	4.68	5.55 (4.41 to 7.16)	●
Bristol, City of	6,467	4.02	4.05 (3.26 to 5.15)	1.09	1.45 (1.03 to 2.30)	5.10	5.48 (4.42 to 6.89)	●
Bromley	4,103	2.92	3.77 (2.93 to 4.97)	0.73	1.43 (0.97 to 2.28)	3.66	5.15 (4.04 to 6.72)	●
Buckinghamshire	6,022	4.48	4.26 (3.31 to 5.52)	1.33	1.58 (1.13 to 2.39)	5.81	5.87 (4.81 to 7.41)	●
Bury	2,343	5.98	4.52 (3.43 to 6.12)	2.15	1.79 (1.23 to 2.90)	8.11	6.41 (5.01 to 8.31)	●
Calderdale	2,548	5.10	4.35 (3.39 to 5.65)	2.37	1.82 (1.23 to 2.94)	7.46	6.27 (4.97 to 8.07)	●
Cambridgeshire	7,300	4.25	4.38 (3.48 to 5.69)	0.69	1.35 (0.93 to 2.15)	4.93	5.70 (4.68 to 7.15)	●

Local Authority	Total births [§]	Rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Camden	2,710	2.21	3.64 (2.75 to 4.94)	1.48	1.59 (1.11 to 2.60)	3.69	5.18 (3.99 to 6.90)	●
Central Bedfordshire	3,255	*	3.91 (3.02 to 5.11)	*	1.48 (0.99 to 2.39)	3.38	5.36 (4.18 to 7.00)	●
Cheshire East	3,769	4.78	4.47 (3.44 to 6.04)	1.60	1.71 (1.20 to 2.75)	6.37	6.26 (4.97 to 8.14)	●
Cheshire West and Chester	3,540	1.98	3.68 (2.79 to 4.84)	3.40	2.22 (1.52 to 3.75)	5.37	5.88 (4.66 to 7.60)	●
Cornwall	5,510	*	4.33 (3.43 to 5.64)	*	1.30 (0.89 to 2.08)	4.54	5.58 (4.52 to 7.14)	●
County Durham	5,390	3.53	4.02 (3.14 to 5.21)	2.61	2.05 (1.48 to 3.19)	6.12	6.12 (5.04 to 7.64)	●
Coventry	4,607	5.21	4.35 (3.45 to 5.77)	1.31	1.55 (1.11 to 2.50)	6.51	5.91 (4.71 to 7.47)	●
Croydon	5,678	4.76	4.02 (3.13 to 5.13)	1.77	1.65 (1.22 to 2.60)	6.52	5.67 (4.73 to 7.13)	●
Cumbria	4,775	2.09	3.62 (2.73 to 4.91)	2.94	2.18 (1.52 to 3.43)	5.03	5.78 (4.69 to 7.34)	●
Darlington	1,229	*	4.15 (3.09 to 5.49)	*	1.52 (0.97 to 2.54)	4.07	5.67 (4.36 to 7.63)	●
Derby	3,527	4.25	4.09 (3.22 to 5.42)	3.42	2.12 (1.51 to 3.50)	7.66	6.27 (5.04 to 7.91)	●
Derbyshire	7,893	3.04	3.82 (2.95 to 4.91)	2.54	2.16 (1.59 to 3.40)	5.57	6.00 (4.92 to 7.47)	●
Devon	7,187	2.64	3.73 (2.92 to 4.84)	1.12	1.52 (1.07 to 2.43)	3.76	5.22 (4.13 to 6.63)	●
Doncaster	3,574	4.48	4.27 (3.35 to 5.62)	0.84	1.49 (1.03 to 2.46)	5.32	5.75 (4.49 to 7.38)	●
Dorset	3,500	3.43	4.10 (3.16 to 5.35)	1.43	1.67 (1.18 to 2.65)	4.86	5.80 (4.63 to 7.49)	●
Dudley	3,773	3.45	3.95 (3.08 to 5.18)	2.39	1.87 (1.31 to 3.01)	5.83	5.85 (4.69 to 7.55)	●
Ealing	5,532	8.32	5.28 (4.02 to 7.04)	0.91	1.37 (0.94 to 2.20)	9.22	6.68 (5.44 to 8.40)	●
East Riding of Yorkshire	3,024	4.30	4.30 (3.27 to 5.76)	1.00	1.56 (1.07 to 2.59)	5.29	5.90 (4.80 to 7.47)	●
East Sussex	5,163	2.71	3.76 (2.95 to 4.98)	1.17	1.55 (1.09 to 2.41)	3.87	5.28 (4.20 to 6.71)	●
Enfield	4,851	3.50	3.71 (2.82 to 4.94)	0.83	1.38 (0.96 to 2.23)	4.33	5.02 (3.92 to 6.40)	●
Essex	16,515	4.12	4.35 (3.60 to 5.28)	1.82	1.84 (1.44 to 2.66)	5.93	6.22 (5.30 to 7.43)	●
Gateshead	2,287	4.81	4.29 (3.37 to 5.61)	2.64	1.87 (1.31 to 3.05)	7.43	6.25 (4.94 to 8.17)	●
Gloucestershire	6,653	3.91	4.23 (3.38 to 5.34)	1.51	1.67 (1.23 to 2.60)	5.41	5.93 (4.81 to 7.56)	●

Local Authority	Total births [§]	Rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Greenwich	4,394	4.78	4.06 (3.15 to 5.21)	1.14	1.47 (1.01 to 2.29)	5.92	5.51 (4.46 to 7.03)	●
Hackney	4,472	6.26	4.51 (3.51 to 5.86)	1.80	1.62 (1.14 to 2.58)	8.05	6.17 (4.94 to 7.75)	●
Halton	1,561	3.20	4.03 (3.06 to 5.45)	1.93	1.72 (1.16 to 2.80)	5.12	5.78 (4.48 to 7.70)	●
Hammersmith and Fulham	2,458	2.44	3.72 (2.78 to 4.93)	2.04	1.72 (1.24 to 2.78)	4.48	5.40 (4.23 to 6.95)	●
Hampshire	14,486	2.97	3.68 (2.95 to 4.60)	0.97	1.35 (1.01 to 2.02)	3.93	4.98 (4.14 to 6.15)	●
Haringey	4,033	5.21	4.25 (3.36 to 5.53)	1.25	1.46 (1.02 to 2.27)	6.45	5.77 (4.64 to 7.34)	●
Harrow	3,546	2.82	3.54 (2.71 to 4.71)	1.13	1.53 (1.03 to 2.41)	3.95	5.00 (3.84 to 6.54)	●
Hartlepool	1,053	7.60	4.48 (3.37 to 6.40)	3.83	1.89 (1.26 to 3.21)	11.40	6.51 (5.04 to 8.90)	●
Havering	3,166	*	4.19 (3.23 to 5.55)	*	1.46 (0.99 to 2.47)	5.05	5.64 (4.47 to 7.33)	●
Herefordshire, County of	1,737	5.76	4.47 (3.47 to 6.16)	1.74	1.72 (1.18 to 2.97)	7.48	6.29 (4.86 to 8.21)	●
Hertfordshire	14,561	2.75	3.42 (2.70 to 4.35)	1.72	1.77 (1.37 to 2.60)	4.46	5.15 (4.35 to 6.33)	●
Hillingdon	4,454	*	3.99 (3.22 to 5.15)	*	1.31 (0.87 to 2.06)	4.94	5.25 (4.12 to 6.65)	●
Hounslow	4,254	3.06	3.58 (2.73 to 4.76)	1.89	1.70 (1.21 to 2.79)	4.94	5.24 (4.21 to 6.69)	●
Isle of Wight	1,317	*	3.87 (2.88 to 5.16)	*	1.68 (1.12 to 2.76)	3.04	5.55 (4.26 to 7.34)	●
Islington	2,891	3.11	3.73 (2.83 to 4.91)	1.39	1.54 (1.09 to 2.49)	4.50	5.22 (4.08 to 6.69)	●
Kensington and Chelsea	1,836	*	4.39 (3.40 to 5.96)	*	1.50 (1.00 to 2.48)	6.54	5.90 (4.62 to 7.82)	●
Kent	17,375	4.03	4.22 (3.53 to 5.13)	1.16	1.37 (1.06 to 2.00)	5.18	5.60 (4.84 to 6.67)	●
Kingston upon Hull, City of	3,565	7.57	5.12 (3.85 to 6.96)	2.54	1.89 (1.32 to 3.07)	10.10	7.19 (5.58 to 9.51)	●
Kingston upon Thames	2,255	4.43	4.16 (3.16 to 5.39)	1.78	1.72 (1.17 to 2.77)	6.21	5.92 (4.58 to 7.55)	●
Kirklees	5,518	6.89	5.00 (3.84 to 6.48)	2.37	1.92 (1.36 to 2.99)	9.24	7.06 (5.60 to 8.99)	●
Knowsley	1,904	*	4.61 (3.47 to 6.23)	*	1.58 (1.07 to 2.48)	7.88	6.26 (4.89 to 8.17)	●
Lambeth	4,560	2.63	3.45 (2.60 to 4.58)	2.20	1.78 (1.28 to 2.85)	4.82	5.16 (4.12 to 6.58)	●
Lancashire	13,269	3.84	4.08 (3.40 to 5.14)	1.44	1.59 (1.20 to 2.30)	5.28	5.67 (4.75 to 6.97)	●

Local Authority	Total births [§]	Rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Leeds	10,514	3.52	3.71 (2.98 to 4.69)	2.39	1.96 (1.49 to 2.93)	5.90	5.66 (4.76 to 6.85)	●
Leicester	5,289	5.10	4.08 (3.23 to 5.24)	1.71	1.63 (1.19 to 2.69)	6.81	5.73 (4.69 to 7.12)	●
Leicestershire	7,155	4.05	4.28 (3.35 to 5.43)	2.25	2.02 (1.45 to 3.15)	6.29	6.37 (5.21 to 8.13)	●
Lewisham	4,800	5.21	4.16 (3.31 to 5.35)	1.05	1.43 (1.00 to 2.36)	6.25	5.58 (4.56 to 6.97)	●
Lincolnshire	7,783	3.98	4.27 (3.43 to 5.55)	1.55	1.70 (1.22 to 2.55)	5.52	6.00 (4.97 to 7.39)	●
Liverpool	5,882	5.61	4.69 (3.68 to 6.12)	1.71	1.66 (1.22 to 2.59)	7.31	6.40 (5.13 to 8.09)	●
Luton	3,503	5.99	4.34 (3.30 to 5.85)	2.30	1.80 (1.27 to 2.83)	8.28	6.21 (5.03 to 7.91)	●
Manchester	7,990	4.38	3.91 (3.18 to 4.89)	2.26	1.79 (1.37 to 2.65)	6.63	5.69 (4.74 to 6.96)	●
Medway	3,551	6.20	4.73 (3.58 to 6.30)	1.70	1.69 (1.21 to 2.70)	7.89	6.52 (5.18 to 8.24)	●
Merton	3,287	3.95	4.01 (3.09 to 5.26)	1.22	1.59 (1.10 to 2.53)	5.17	5.60 (4.52 to 7.34)	●
Middlesbrough	2,008	1.99	3.73 (2.82 to 4.99)	3.99	1.96 (1.34 to 3.39)	5.98	5.76 (4.49 to 7.73)	●
Milton Keynes	3,671	2.72	3.68 (2.76 to 4.80)	2.46	1.90 (1.35 to 3.06)	5.18	5.55 (4.39 to 7.27)	●
Newcastle upon Tyne	3,297	*	4.03 (3.08 to 5.28)	*	1.42 (0.95 to 2.32)	4.55	5.40 (4.30 to 6.92)	●
Newham	6,074	6.26	4.42 (3.58 to 5.64)	1.33	1.46 (1.02 to 2.25)	7.57	5.89 (4.80 to 7.30)	●
Norfolk	9,134	2.96	3.74 (3.03 to 4.84)	1.76	1.79 (1.27 to 2.72)	4.71	5.53 (4.52 to 6.79)	●
North East Lincolnshire	1,952	4.61	4.23 (3.27 to 5.77)	1.54	1.67 (1.14 to 2.71)	6.15	5.95 (4.66 to 7.82)	●
North Lincolnshire	1,740	3.45	4.09 (3.08 to 5.45)	1.73	1.72 (1.16 to 2.78)	5.17	5.84 (4.54 to 7.62)	●
North Somerset	2,205	*	4.31 (3.36 to 5.72)	*	1.58 (1.08 to 2.59)	5.44	5.91 (4.73 to 7.76)	●
North Tyneside	2,294	2.18	3.83 (2.87 to 5.11)	1.75	1.71 (1.18 to 2.83)	3.92	5.54 (4.27 to 7.05)	●
North Yorkshire	5,652	3.89	4.23 (3.35 to 5.43)	1.42	1.64 (1.18 to 2.59)	5.31	5.90 (4.82 to 7.56)	●
Northamptonshire	8,778	3.76	4.06 (3.23 to 5.09)	2.63	2.21 (1.60 to 3.38)	6.38	6.31 (5.28 to 7.84)	●
Northumberland	2,768	6.14	4.68 (3.54 to 6.25)	2.18	1.80 (1.27 to 2.98)	8.31	6.62 (5.25 to 8.71)	●
Nottingham	4,262	7.04	4.81 (3.71 to 6.42)	2.84	1.95 (1.35 to 3.13)	9.85	6.88 (5.50 to 8.76)	●

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		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Nottinghamshire	8,685	2.42	3.49 (2.69 to 4.53)	2.42	2.11 (1.59 to 3.29)	4.84	5.56 (4.56 to 6.90)	●
Oldham	3,291	3.95	3.99 (3.16 to 5.39)	3.66	2.13 (1.48 to 3.50)	7.60	6.17 (4.97 to 7.89)	●
Oxfordshire	7,808	3.33	3.92 (3.06 to 5.09)	1.29	1.57 (1.15 to 2.43)	4.61	5.47 (4.46 to 6.88)	●
Peterborough	3,150	5.08	4.33 (3.30 to 5.72)	2.55	1.91 (1.35 to 3.12)	7.62	6.34 (5.16 to 8.17)	●
Plymouth	3,148	7.62	5.13 (3.73 to 7.18)	1.92	1.75 (1.23 to 2.82)	9.53	7.04 (5.53 to 9.19)	●
Poole	1,647	*	3.69 (2.67 to 4.96)	*	1.55 (1.03 to 2.53)	*	5.19 (3.85 to 6.91)	●
Portsmouth	2,697	4.45	4.22 (3.28 to 5.60)	1.49	1.66 (1.10 to 2.68)	5.93	5.91 (4.75 to 7.60)	●
Reading	2,564	6.63	4.55 (3.51 to 6.14)	1.18	1.59 (1.07 to 2.55)	7.80	6.20 (4.82 to 7.91)	●
Redbridge	4,697	2.55	3.36 (2.50 to 4.41)	1.71	1.63 (1.13 to 2.55)	4.26	4.91 (3.86 to 6.49)	●
Redcar and Cleveland	1,428	*	4.16 (3.15 to 5.63)	*	1.49 (0.94 to 2.52)	4.20	5.64 (4.35 to 7.46)	●
Richmond upon Thames	2,598	3.85	4.14 (3.14 to 5.56)	1.93	1.76 (1.21 to 2.75)	5.77	5.95 (4.73 to 7.73)	●
Rochdale	2,854	5.26	4.29 (3.28 to 5.52)	1.41	1.58 (1.06 to 2.72)	6.66	5.90 (4.71 to 7.52)	●
Rotherham	3,105	4.51	4.24 (3.27 to 5.55)	2.91	1.99 (1.42 to 3.25)	7.41	6.32 (5.00 to 8.23)	●
Salford	3,525	3.97	4.04 (3.17 to 5.36)	2.28	1.81 (1.27 to 2.85)	6.24	5.87 (4.68 to 7.51)	●
Sandwell	4,708	5.31	4.32 (3.39 to 5.61)	2.56	1.90 (1.34 to 2.98)	7.86	6.29 (5.15 to 7.84)	●
Sefton	2,791	3.58	4.09 (3.13 to 5.31)	1.80	1.65 (1.14 to 2.86)	5.37	5.86 (4.66 to 7.55)	●
Sheffield	6,612	5.44	4.60 (3.64 to 5.81)	1.98	1.76 (1.28 to 2.74)	7.41	6.40 (5.09 to 8.06)	●
Shropshire	2,848	4.21	4.29 (3.34 to 5.58)	2.47	1.91 (1.30 to 3.24)	6.67	6.29 (5.01 to 8.30)	●
Slough	2,605	5.37	4.14 (3.16 to 5.45)	1.16	1.56 (1.05 to 2.46)	6.53	5.71 (4.62 to 7.49)	●
Solihull	2,261	2.65	3.87 (2.89 to 5.12)	1.77	1.72 (1.18 to 2.83)	4.42	5.59 (4.45 to 7.38)	●
Somerset	5,620	4.63	4.53 (3.54 to 5.93)	0.89	1.47 (1.02 to 2.28)	5.52	6.02 (4.91 to 7.60)	●
South Gloucestershire	3,155	4.75	4.42 (3.47 to 5.94)	1.27	1.63 (1.12 to 2.84)	6.02	6.10 (4.84 to 8.09)	●
South Tyneside	1,598	*	4.09 (3.10 to 5.42)	*	1.62 (1.08 to 2.71)	5.01	5.72 (4.52 to 7.41)	●

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		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Southampton	3,326	*	4.39 (3.33 to 5.78)	*	1.44 (0.98 to 2.24)	5.71	5.84 (4.64 to 7.43)	●
Southend-on-Sea	2,218	*	3.81 (2.88 to 5.08)	*	1.48 (1.01 to 2.41)	2.71	5.24 (4.09 to 6.96)	●
Southwark	4,698	4.26	3.84 (3.03 to 5.01)	1.71	1.61 (1.15 to 2.56)	5.96	5.43 (4.25 to 6.87)	●
St. Helens	1,979	4.04	4.15 (3.19 to 5.50)	2.03	1.75 (1.17 to 2.84)	6.06	5.95 (4.65 to 7.84)	●
Staffordshire	8,702	3.79	4.18 (3.41 to 5.39)	1.85	1.83 (1.37 to 2.84)	5.63	6.06 (4.90 to 7.58)	●
Stockport	3,394	3.83	4.13 (3.14 to 5.52)	0.89	1.52 (1.02 to 2.45)	4.71	5.64 (4.51 to 7.31)	●
Stockton-on-Tees	2,342	4.70	4.27 (3.26 to 5.69)	1.72	1.69 (1.16 to 2.74)	6.40	6.01 (4.65 to 7.88)	●
Stoke-on-Trent	3,649	4.11	4.08 (3.19 to 5.32)	2.75	1.96 (1.39 to 3.28)	6.85	6.10 (4.90 to 7.93)	●
Suffolk	8,004	4.50	4.51 (3.61 to 5.79)	2.01	1.90 (1.36 to 2.87)	6.50	6.50 (5.26 to 8.25)	●
Sunderland	2,896	3.45	4.01 (2.99 to 5.37)	3.12	2.04 (1.36 to 3.28)	6.56	6.10 (4.79 to 7.90)	●
Surrey	13,582	3.83	4.15 (3.40 to 5.20)	1.26	1.51 (1.13 to 2.18)	5.08	5.65 (4.71 to 6.76)	●
Sutton	2,764	*	4.16 (3.20 to 5.48)	*	1.51 (0.94 to 2.50)	5.07	5.67 (4.52 to 7.24)	●
Swindon	2,928	*	3.69 (2.74 to 4.91)	*	1.49 (0.97 to 2.46)	2.73	5.12 (3.79 to 6.59)	●
Tameside	2,995	6.34	4.70 (3.58 to 6.45)	1.01	1.55 (1.05 to 2.43)	7.35	6.31 (4.93 to 8.29)	●
Telford and Wrekin	2,045	2.93	3.93 (2.99 to 5.32)	2.45	1.82 (1.25 to 3.04)	5.38	5.77 (4.54 to 7.57)	●
Thurrock	2,369	5.49	4.39 (3.37 to 5.95)	2.12	1.77 (1.23 to 2.90)	7.60	6.26 (4.91 to 8.32)	●
Torbay	1,453	*	4.34 (3.27 to 5.78)	*	1.66 (1.13 to 2.76)	6.88	6.06 (4.76 to 8.08)	●
Tower Hamlets	4,651	5.81	4.29 (3.41 to 5.58)	1.73	1.49 (1.07 to 2.33)	7.53	5.75 (4.72 to 7.37)	●
Trafford	2,712	4.06	4.14 (3.21 to 5.58)	1.11	1.58 (1.12 to 2.49)	5.16	5.73 (4.47 to 7.42)	●
Wakefield	3,996	5.01	4.46 (3.48 to 5.85)	1.76	1.73 (1.23 to 2.77)	6.76	6.27 (4.98 to 8.15)	●
Walsall	3,760	3.46	3.85 (2.94 to 5.04)	5.34	2.78 (1.84 to 4.62)	8.78	6.61 (5.26 to 8.44)	●
Waltham Forest	4,642	4.52	3.99 (3.16 to 5.18)	1.73	1.64 (1.19 to 2.53)	6.25	5.64 (4.65 to 7.09)	●
Wandsworth	5,122	2.54	3.57 (2.68 to 4.79)	0.98	1.45 (1.04 to 2.24)	3.51	4.94 (3.82 to 6.35)	●

Local Authority	Total births [§]	Rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Warrington	2,348	1.28	3.67 (2.71 to 4.97)	1.71	1.71 (1.18 to 2.79)	2.98	5.35 (4.19 to 7.16)	●
Warwickshire	5,905	3.90	4.16 (3.26 to 5.37)	2.72	2.14 (1.53 to 3.39)	6.60	6.37 (5.15 to 8.00)	●
West Berkshire	1,860	4.30	4.22 (3.30 to 5.69)	1.62	1.70 (1.18 to 2.77)	5.91	5.97 (4.67 to 7.85)	●
West Sussex	8,747	3.20	3.88 (3.10 to 5.00)	1.72	1.79 (1.31 to 2.68)	4.92	5.68 (4.67 to 7.01)	●
Westminster	2,638	*	4.04 (3.07 to 5.48)	*	1.40 (0.92 to 2.32)	4.55	5.37 (4.26 to 6.96)	●
Wigan	3,672	4.90	4.45 (3.50 to 5.95)	1.92	1.78 (1.26 to 2.95)	6.81	6.32 (5.04 to 8.20)	●
Wiltshire	5,312	3.01	3.88 (3.02 to 5.11)	1.51	1.67 (1.16 to 2.60)	4.52	5.54 (4.38 to 6.99)	●
Windsor and Maidenhead	1,682	4.76	4.23 (3.17 to 5.70)	1.79	1.71 (1.16 to 2.84)	6.54	6.00 (4.74 to 7.96)	●
Wirral	3,553	4.22	4.23 (3.26 to 5.60)	0.85	1.49 (0.99 to 2.49)	5.07	5.72 (4.49 to 7.40)	●
Wokingham	1,824	*	4.67 (3.57 to 6.54)	*	1.61 (1.10 to 2.67)	8.22	6.37 (5.09 to 8.43)	●
Wolverhampton	3,506	7.13	4.76 (3.69 to 6.52)	2.30	1.78 (1.25 to 2.81)	9.41	6.66 (5.32 to 8.65)	●
Worcestershire	5,908	3.72	4.10 (3.15 to 5.33)	2.21	1.93 (1.40 to 3.08)	5.92	6.08 (4.93 to 7.62)	●
York	2,029	4.44	4.27 (3.30 to 5.57)	1.98	1.77 (1.21 to 2.94)	6.41	6.11 (4.80 to 7.96)	●
SCOTLAND								
Aberdeen City	2,577	3.88	4.14 (3.15 to 5.55)	2.34	1.85 (1.24 to 3.08)	6.21	6.05 (4.74 to 7.94)	●
Aberdeenshire	2,834	5.29	4.57 (3.53 to 6.19)	2.48	1.92 (1.31 to 3.21)	7.76	6.64 (5.31 to 9.12)	●
Angus	1,135	*	4.13 (3.10 to 5.57)	*	1.63 (1.08 to 2.78)	4.41	5.79 (4.43 to 7.71)	●
Argyll and Bute	722	*	4.08 (3.07 to 5.49)	*	1.59 (1.06 to 2.79)	*	5.69 (4.38 to 7.51)	●
City of Edinburgh	5,542	3.25	△	1.99	△	5.23	△	○
Clackmannanshire	558	*	4.11 (3.08 to 5.47)	*	1.79 (1.25 to 3.10)	7.17	5.96 (4.62 to 7.86)	●
Dumfries and Galloway	1,287	*	3.97 (2.98 to 5.27)	*	1.69 (1.14 to 2.91)	3.89	5.68 (4.35 to 7.30)	●
Dundee City	1,703	*	3.73 (2.69 to 5.08)	*	1.87 (1.26 to 3.19)	4.11	5.58 (4.30 to 7.39)	●
East Ayrshire	1,252	*	4.34 (3.21 to 5.86)	*	1.60 (1.08 to 2.64)	6.39	5.99 (4.60 to 7.98)	●
East Dunbartonshire	939	*	4.20 (3.08 to 5.73)	*	1.65 (1.09 to 2.74)	5.32	5.89 (4.52 to 7.78)	●

Local Authority	Total births [§]	Rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
East Lothian	1,019	*	Δ	*	Δ	7.85	Δ	○
East Renfrewshire	862	*	3.94 (2.88 to 5.37)	*	1.57 (1.00 to 2.64)	*	5.50 (4.16 to 7.33)	●
Eilean Siar	214	*	Δ	*	Δ	*	Δ	○
Falkirk	1,717	1.75	3.85 (2.95 to 5.20)	2.33	1.81 (1.21 to 3.14)	4.08	5.67 (4.44 to 7.37)	●
Fife	3,894	4.37	4.32 (3.34 to 5.71)	1.29	1.60 (1.15 to 2.53)	5.65	5.97 (4.83 to 7.69)	●
Glasgow City	7,441	2.82	3.62 (2.74 to 4.75)	2.02	1.82 (1.40 to 2.77)	4.84	5.42 (4.46 to 6.72)	●
Highland	2,300	*	4.02 (2.98 to 5.34)	*	1.48 (0.98 to 2.34)	3.48	5.48 (4.18 to 7.22)	●
Inverclyde	739	*	4.06 (3.03 to 5.64)	*	1.58 (1.03 to 2.64)	*	5.64 (4.31 to 7.55)	●
Midlothian	1,050	3.81	Δ	2.87	Δ	6.67	Δ	○
Moray	933	4.29	4.20 (3.15 to 5.90)	5.38	2.06 (1.29 to 3.57)	9.65	6.37 (4.89 to 8.80)	●
North Ayrshire	1,310	*	4.21 (3.14 to 5.60)	*	1.51 (0.94 to 2.44)	4.58	5.72 (4.31 to 7.59)	●
North Lanarkshire	3,702	6.21	4.92 (3.66 to 6.73)	2.45	1.95 (1.35 to 3.16)	8.64	7.05 (5.57 to 9.33)	●
Orkney Islands	180	*	4.17 (3.08 to 5.59)	*	1.66 (1.06 to 2.88)	*	5.88 (4.42 to 7.98)	●
Perth and Kinross	1,359	*	3.80 (2.80 to 5.20)	*	1.78 (1.26 to 2.96)	2.94	5.57 (4.18 to 7.31)	●
Renfrewshire	1,801	5.00	4.34 (3.19 to 5.85)	2.79	1.88 (1.23 to 3.14)	7.77	6.32 (5.02 to 8.33)	●
Scottish Borders	1,001	*	4.38 (3.34 to 6.00)	*	1.74 (1.16 to 3.05)	7.99	6.21 (4.82 to 8.21)	●
Shetland Islands	264	*	4.14 (3.05 to 5.73)	*	1.65 (1.12 to 2.79)	*	5.83 (4.37 to 7.78)	●
South Ayrshire	1,037	5.79	4.33 (3.27 to 5.82)	2.91	1.81 (1.24 to 3.08)	8.68	6.24 (4.98 to 8.42)	●
South Lanarkshire	3,400	2.94	3.96 (2.98 to 5.24)	1.77	1.76 (1.22 to 2.76)	4.71	5.74 (4.65 to 7.40)	●
Stirling	817	*	4.14 (3.10 to 5.68)	*	1.58 (1.01 to 2.70)	3.67	5.73 (4.43 to 7.55)	●
West Dunbartonshire	994	3.02	4.05 (3.07 to 5.43)	4.04	1.91 (1.28 to 3.25)	7.04	6.02 (4.65 to 8.05)	●
West Lothian	2,039	*	Δ	*	Δ	4.90	Δ	○
WALES								
Blaenau Gwent	778	*	4.41 (3.17 to 5.96)	*	1.75 (1.18 to 2.96)	10.28	6.26 (4.85 to 8.48)	●

Local Authority	Total births [§]	Rate per 1,000 births [§]						
		Stillbirth [†]		Neonatal [†]		Extended perinatal [†]		
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]	
Bridgend	1,487	*	4.17 (3.19 to 5.60)	*	1.50 (0.97 to 2.52)	4.03	5.67 (4.42 to 7.44)	●
Caerphilly	2,135	*	4.02 (3.10 to 5.32)	*	1.49 (1.01 to 2.45)	3.75	5.49 (4.33 to 7.30)	●
Cardiff	4,634	5.61	4.58 (3.58 to 6.12)	2.39	1.87 (1.35 to 2.97)	7.98	6.55 (5.30 to 8.42)	●
Carmarthenshire	1,819	2.20	3.89 (2.98 to 5.17)	2.20	1.79 (1.23 to 3.06)	4.40	5.70 (4.44 to 7.57)	●
Ceredigion	604	*	4.12 (3.03 to 5.57)	*	1.80 (1.13 to 3.14)	6.62	5.98 (4.63 to 8.01)	●
Conwy	1,112	*	4.12 (3.06 to 5.52)	*	1.54 (1.00 to 2.55)	3.60	5.66 (4.43 to 7.42)	●
Denbighshire	1,112	*	3.84 (2.79 to 5.16)	*	1.53 (0.97 to 2.57)	*	5.34 (4.07 to 6.98)	●
Flintshire	1,629	4.91	4.30 (3.31 to 5.91)	1.85	1.72 (1.17 to 2.97)	6.75	6.10 (4.79 to 8.14)	●
Gwynedd	1,184	*	4.69 (3.53 to 6.46)	*	1.71 (1.16 to 2.77)	10.14	6.53 (4.99 to 8.68)	●
Isle of Anglesey	750	*	4.15 (3.15 to 5.60)	*	1.67 (1.14 to 2.87)	5.33	5.87 (4.54 to 7.61)	●
Merthyr Tydfil	755	*	4.33 (3.15 to 5.93)	*	1.76 (1.17 to 2.94)	9.27	6.18 (4.67 to 8.30)	●
Monmouthshire	773	*	4.24 (3.13 to 5.81)	*	1.67 (1.09 to 2.76)	6.47	5.96 (4.57 to 7.93)	●
Neath Port Talbot	1,503	6.65	4.53 (3.38 to 6.20)	2.01	1.74 (1.19 to 2.90)	8.65	6.37 (4.82 to 8.44)	●
Newport	1,895	2.64	3.90 (2.84 to 5.29)	2.65	1.84 (1.28 to 3.02)	5.28	5.77 (4.55 to 7.49)	●
Pembrokeshire	1,235	*	3.89 (2.94 to 5.26)	*	1.60 (1.09 to 2.58)	2.43	5.48 (4.21 to 7.22)	●
Powys	1,154	*	4.22 (3.20 to 5.68)	*	1.63 (1.10 to 2.76)	5.20	5.89 (4.40 to 7.62)	●
Rhondda Cynon Taf	2,754	6.17	4.66 (3.58 to 6.34)	2.56	1.89 (1.32 to 3.16)	8.71	6.69 (5.20 to 8.64)	●
Swansea	2,540	7.09	4.84 (3.64 to 6.77)	2.78	1.93 (1.30 to 3.21)	9.84	6.95 (5.28 to 9.30)	●
Torfaen	1,009	*	4.06 (3.10 to 5.49)	*	1.64 (1.10 to 2.65)	3.96	5.71 (4.44 to 7.45)	●
Vale of Glamorgan	1,279	*	4.24 (3.23 to 5.75)	*	1.59 (1.08 to 2.62)	5.47	5.87 (4.58 to 7.57)	●
Wrexham	1,610	*	4.21 (3.27 to 5.77)	*	1.56 (1.06 to 2.51)	4.97	5.78 (4.38 to 7.67)	●
NORTHERN IRELAND[°]								
Northern Ireland [°]	24,498	3.76	4.13 (3.51 to 5.02)	2.99	2.79 (2.27 to 3.95)	6.74	6.97 (6.00 to 8.22)	●

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		Stillbirth [†]		Neonatal [‡]		Extended perinatal [†]	
		Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI)	Crude	Stabilised & adjusted (95% CI) [#]

CROWN DEPENDENCIES

Bailiwick of Guernsey	620	*	4.01 (2.92 to 5.61)	*	1.69 (1.11 to 2.86)	*	5.72 (4.35 to 7.55)	●
Bailiwick of Jersey	986	*	3.89 (2.86 to 5.25)	*	1.55 (1.03 to 2.66)	*	5.42 (4.11 to 7.09)	●
Isle Of Man	812	*	3.92 (2.98 to 5.42)	*	1.73 (1.13 to 2.99)	3.69	5.67 (4.45 to 7.56)	●

[†] per 1,000 total births

[‡] per 1,000 live births

[§] excluding terminations of pregnancy and births <24⁺⁰ weeks gestational age

[○] different laws exist in Northern Ireland for the termination of pregnancy

[△] stabilised & adjusted rate not calculated due to unavailability of some individual level data

* entry suppressed because of small number of deaths

[#] colours represent variation from UK average extended perinatal mortality rate

Data sources: MBRRACE-UK, NN4B, ONS, NRS, ISD, NIMATS, States of Guernsey, States of Jersey



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