

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



MBRRACE-UK Perinatal Mortality Surveillance Report

**UK Perinatal Deaths for Births from
January to December 2020**

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on behalf of the MBRRACE-UK collaboration

October 2022



Funding

The Maternal, Newborn and Infant Clinical Outcome Review Programme, delivered by MBRRACE-UK, is commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP). HQIP is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing, and National Voices. Its aim is to promote quality improvement in patient outcomes. The Clinical Outcome Review Programmes, which encompass confidential enquiries, are designed to help assess the quality of healthcare, and stimulate improvement in safety and effectiveness by systematically enabling clinicians, managers, and policy makers to learn from adverse events and other relevant data. HQIP holds the contract to commission, manage, and develop the National Clinical Audit and Patient Outcomes Programme (NCAPOP), comprising around 40 projects covering care provided to people with a wide range of medical, surgical and mental health conditions. The Maternal, Newborn and Infant Clinical Outcome Review Programme is funded by NHS England, NHS Wales, the Health and Social Care division of the Scottish Government, the Northern Ireland Department of Health, and the States of Jersey, Guernsey, and the Isle of Man.

More details can be found at: www.hqip.org.uk/national-programmes.

Stakeholder involvement

Organisations representing parents and families are involved in the MBRRACE-UK programme as part of the 'Third Sector' stakeholder group, identifying possible areas for future research and helping to communicate key findings and messages from the programme to parents, families, the public and policy makers, including through the development of lay summary reports. A full list of organisations can be found at the end of the Tables and Figures document which accompanies this report.

Design by: Ian Gallimore

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Executive Summary

Introduction

MBRRACE-UK is commissioned by the Healthcare Quality Improvement Partnership (HQIP) to undertake the Maternal, Newborn and Infant Clinical Outcome Review Programme (MNI-CORP). The aims of the 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 perinatal deaths from 22⁺⁰ weeks' gestational age (including late fetal losses, stillbirths, and neonatal deaths) of babies born between 1st January and 31st December 2020.**

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 (from 20⁺⁰ weeks' gestational age).
4. A biennial programme of topic-specific confidential enquiries into aspects of stillbirth and infant death or serious infant morbidity.

Perinatal mortality surveillance involves the identification and notification of all eligible deaths and the timely 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 '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. The information is presented in order to assist clinicians, commissioners, managers, parents, and the public in raising standards of maternity and neonatal care in order to reduce perinatal mortality across the UK.

Mortality rates for individual organisations, including Trusts and Health Boards, can be found online at: <http://www.npeu.ox.ac.uk/mbrance-uk/reports>. Additional tables and figures can be found in the accompanying Tables and Figures document. This report should be read in conjunction with the accompanying Technical Document, which contains full details of the MBRRACE-UK methodology, including case ascertainment and statistical methods. All these documents are available for download from the MBRRACE-UK website: <http://www.npeu.ox.ac.uk/mbrance-uk/reports>.

Key findings

Perinatal mortality rates in the UK: 2020

1. Extended perinatal mortality has reduced by 20% over seven years, from 6.04 per 1,000 total births in 2013 to 4.85 per 1,000 total births in 2020, equivalent to approximately 820 fewer deaths in 2020.
2. Stillbirth rates have reduced by 21% from 4.20 per 1,000 total births in 2013 to 3.33 per 1,000 total births in 2020, representing approximately 605 fewer stillbirths in 2020.
3. Neonatal mortality has reduced by 17% from 1.84 per 1,000 live births in 2013 to 1.53 deaths per 1,000 live births in 2020, representing approximately 215 fewer neonatal deaths in 2020 and an increased rate of reduction.

Perinatal mortality rates for Trusts and Health Boards

1. After adjustment for risk factors and unit size, stillbirth rates show increased variation between Trusts and Health Boards compared to previous years, with only 69% of stabilised & adjusted rates for all organisations falling within 5% of their comparator group average.
2. Stabilised & adjusted neonatal mortality rates for organisations that care for the most complex pregnancies and births show wide variation: only 23% of Trusts and Health Boards with a Level 3 Neonatal Intensive Care Unit (NICU) and neonatal surgical provision had a stabilised & adjusted neonatal mortality rate within 5% of their comparator group average.

3. Unlike previous years, the exclusion of deaths due to congenital anomalies had little effect on the variation in stabilised & adjusted stillbirth rates, with only 68% of Trusts and Health Boards falling within 5% of their comparator group average.
4. Exclusion of deaths due to congenital anomalies reduced the variation in stabilised & adjusted neonatal mortality rates, with 50% of Trusts and Health Boards with a Level 3 Neonatal Intensive Care Unit (NICU) and neonatal surgical provision having a stabilised & adjusted neonatal mortality rate within 5% of their comparator group average.

Mortality rates by gestational age

1. The overall reduction in the stillbirth rate is mainly due to a reduction in the rate of term stillbirths by 19%, from 1.52 per 1,000 total births in 2016 to 1.23 in 2020 (an increase from 1.17 in 2019). There was a reduction in the rate of stillbirth for all preterm births from 2016 to 2020.
2. The largest reduction in the neonatal mortality rate was for extremely preterm births (24⁺⁰ to 27⁺⁶ weeks' gestational age), a 14% reduction from 158.9 per 1,000 live births in 2016 to 135.6 in 2020. However, for very preterm births (28⁺⁰ to 31⁺⁶ weeks' gestational age) the neonatal mortality rate has slightly increased from 29.0 to 30.6 per 1,000 live births over the same period.
3. Almost three-quarters of both stillbirths and neonatal deaths (including babies born at 22-23 weeks' gestational age) were preterm births (<37 weeks' gestational age): 73% and 71% respectively.
4. In 2020, 34% of reported stillbirths and late fetal losses and 43% of neonatal deaths occurred in babies who were born extremely preterm (22⁺⁰ to 27⁺⁶ weeks' gestational age).
5. Numbers and rates of post-term births (≥42 weeks' gestational age) remained low and stable over the period 2016 to 2020.

Effect of ethnicity and deprivation on perinatal mortality

1. Stillbirth and neonatal mortality rates increased with deprivation across all ethnic groups.
2. Stillbirth and neonatal mortality rates were lowest for babies of White ethnicity from the least deprived areas (2.78 stillbirths per 1,000 total births and 1.26 neonatal deaths per 1,000 live births).
3. The multiple impact of ethnicity and deprivation is highlighted by a stillbirth rate of 8.10 and 7.96 per 1,000 total births for babies of Black African and Black Caribbean ethnicity respectively from the most deprived areas.
4. Neonatal mortality rates were over 3 per 1,000 live births for babies of Pakistani and Black African ethnicity from the most deprived areas.
5. Due to considerably higher proportions of babies of Black African, Black Caribbean, Pakistani and Bangladeshi ethnicity being from more deprived areas, they are disproportionately affected by the higher rates of stillbirth and neonatal death associated with deprivation.

Effect of twin pregnancy on perinatal mortality

1. There has been a 12% reduction in the number of both singleton and twin births over the period 2016 to 2020.
2. There has been an increase in both stillbirth and neonatal mortality rates for twins over the period 2016 to 2020; from 6.16 to 7.33 per 1,000 total births and from 5.34 to 6.18 per 1,000 live births, respectively.
3. The gap between singleton and twin stillbirth and neonatal mortality rates is widening; from 2.31 per 1,000 total births in 2016 to 4.07 per 1,000 total births in 2020 for stillbirths, and from 3.71 per 1,000 live births in 2016 to 4.81 per 1,000 live births in 2020 for neonatal deaths. In 2020 the risk of twin stillbirth was over 2.25 times higher than for singletons and the risk of twin neonatal death was almost 3.5 times higher than for singletons.
4. Compared to singletons, stillbirth and neonatal mortality rates for twins are significantly lower for all preterm births (<37 weeks gestation) and low birth weight infants (<3500g).

Causes of perinatal death

1. Although the proportion of stillbirths classified as of unknown cause has reduced over time, one-third of stillbirths still fall into this category (33% in 2020); a rate of 1.08 per 1,000 total births. An increasing proportion of stillbirths have been classified as due to placental causes over time; just over one-third in 2020 (35%). This represents a rate of 1.16 per 1,000 total births.

2. Around 40% of neonatal deaths are attributed to neonatal causes. The key driver for the reduction in mortality rates for these deaths (a fall from 0.75 to 0.64 per 1,000 live births from 2016 to 2020) is a fall in deaths classified as due to extreme prematurity, from 0.27 to 0.16 per 1,000 live births over the period.
3. Congenital anomalies continue to contribute significantly to mortality rates, comprising around one-third of neonatal deaths and just under one-tenth of stillbirths.

Timeliness of notification of perinatal deaths

1. Timeliness of notification of perinatal deaths continues to improve across the UK. Around two-thirds of deaths in 2020 were notified within 7 days (66% of stillbirths and 61% of neonatal deaths) and around nine-tenths of deaths were notified within 30 days (90% of stillbirths and 85% of neonatal deaths).
2. Variation between UK countries continues to reduce. In 2020, 41% to 68% of stillbirths were notified within 7 days compared with 12% to 33% notified within 7 days in 2017. For neonatal deaths, 27% to 64% were notified within 7 days in 2020 compared with 8% to 27% notified within 7 days in 2017. The overall proportion of deaths notified within 7 days and 30 days has increased over the same period.
3. There was no correlation between the total number of deaths per Trust or Health Board and the percentage of deaths notified within 7 days or 30 days.

New recommendations

1. Commission a review of evidence in order to enhance perinatal services for disadvantaged populations to reduce inequitable outcomes. **ACTION: Policy Makers, Research Funders.**
2. Continue to evaluate and implement the national initiatives to reduce stillbirth and neonatal deaths and monitor their impact on reducing preterm birth, particularly the most extreme preterm group. **ACTION: National and Regional Policy Makers, Integrated Care Boards / Health Boards, Regional Commissioners, Trusts and Health Boards.**
3. Develop UK-wide harmonised indicators to identify high risk groups, including ethnicity and deprivation measures, to facilitate direct population comparisons. **ACTION: UK Government, National Data Handlers, Policy Makers.**
4. Improve the availability and accessibility of initiatives and policies to reduce stillbirth and neonatal mortality across the UK for health professionals, policy makers, academics, health service researchers and the public. Provide regular updates on progress towards publicised ambitions and targets. **ACTION: Policy Makers, UK Public Health Services.**
5. Investigate the characteristics of stillbirths and neonatal deaths in twin pregnancies, particularly with regard to gestation at delivery, in order to understand the reasons for increasing mortality rates. **ACTION: Policy Makers, Research Funders.**
6. Ensure cause of death coding is undertaken by a suitably qualified clinician following PMRT review, and MBRRACE UK surveillance data updated accordingly. **ACTION: Trust and Health Board Directors, Clinical Directors, Heads of Midwifery, Health Professionals.**

Recommendations from previous reports requiring improved implementation

- Enhance current programmes in order to accelerate the reduction of stillbirths and neonatal deaths to meet national targets, with an emphasis on reducing rates of preterm birth, particularly the most extreme preterm group. **ACTION: Policy Makers, UK Public Health Services.**
- Use the MBRRACE-UK real-time data monitoring tool as part of regular mortality meetings to help identify why an organisation's stabilised & adjusted stillbirth, neonatal mortality or extended perinatal mortality rate falls into the red or amber band. **ACTION: Trust and Health Board Directors, Clinical Directors, Heads of Midwifery, Health Professionals.**
- Investigate potential modifiable factors in the treatment of neonates when an organisation's stabilised & adjusted neonatal mortality rate falls into the red or amber bands after exclusion of deaths due to congenital anomalies. Ensure that this encompasses both local population characteristics and quality of care provision. **ACTION: Trust and Health Board Directors, Clinical Directors, Heads of Midwifery.**

- Use the MBRRACE-UK guidance for the assessment of signs of life in births before 24⁺⁰ weeks' gestational age. **ACTION: Trust and Health Board Directors, Clinical Directors, Heads of Midwifery, Health Professionals.**
- Ensure that there is a multi-agency targeted approach affecting people living in areas of high socio-economic deprivation across all points of the reproductive, pregnancy and neonatal healthcare pathway. **ACTION: Policy Makers, UK Public Health Services, Service Planners and Commissioners at local and national level.**
- Identify the specific needs of Black and Asian populations and ensure that these are addressed as part of their reproductive and pregnancy healthcare provision. **ACTION: Service Planners, Service Commissioners, Health Professionals.**
- Initiate a research programme to inform the development of effective interventions to address health inequalities and reduce stillbirth and neonatal mortality rates. **ACTION: Policy Makers, UK Public Health Services, Research Funders.**
- Develop focused initiatives to reduce stillbirths and neonatal deaths among those at the highest risk, informed by the multidimensional effects of ethnicity, deprivation and age. **ACTION: Policy Makers, UK Public Health Services.**
- Emphasise the importance of pre-conception health as a routine part of every health professional's interaction with people who have risk factors for congenital anomaly. **ACTION: UK Public Health Services, Primary Care Providers, Royal Colleges, Trust and Health Board Directors, Clinical Directors, Heads of Midwifery, Health Professionals.**
- Undertake placental histology for all babies admitted to a neonatal unit, preferably by a specialist perinatal pathologist. **ACTION: Trust and Health Board Directors, Clinical Directors, Heads of Midwifery, Health Professionals.**

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Introduction

Deaths reported to MBRRACE-UK

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

- *late fetal losses*: a baby born between 22⁺⁰ and 23⁺⁶ weeks' gestational age showing no signs of life, irrespective of when the death occurred;
- *stillbirths*: a baby born 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) 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.

The 2020 birth cohort

In this report rates of stillbirth, neonatal death and extended perinatal death (stillbirths and neonatal deaths combined) are presented for births from 1st January 2020 to 31st December 2020; thus, neonatal deaths of babies born in December 2020 which occurred in January 2021 are included. The reporting of mortality for a birth cohort is in contrast to statutory publications, which are 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.

The 2020 birth cohort includes babies who were born during the early months of the SARS-Cov2 global pandemic (hereafter referred to as the COVID-19 pandemic), including during the first national 'lockdown' period. The national impact of the pandemic, both direct and indirect, on perinatal deaths is extremely difficult to assess. Care provision during this period was heterogeneous and subject to constant, sometimes weekly change, as healthcare providers adapted to new restrictions, changes in guidance, and staff and resource availability. Data on these changes to care provision is not collected by MBRRACE-UK. The degree of local, regional and national variation means that it is extremely challenging to identify a clear and reliable message about the pandemic's impact over the initial 9 month period covered by this report. As a result, where we have identified possible effects of the pandemic these are included in the corresponding section of the report rather than in a dedicated COVID-19 pandemic section. A more detailed examination of the impact of the pandemic will be presented in next year's report.

Data sources

The data presented in this report is derived from a number of sources in addition to the information submitted via the MBRRACE-UK web-based reporting system: ONS, PDS, NRS, PHS, NISRA, Health and Social Services Department (Bailiwick of Guernsey), and the Health Intelligence Unit (Bailiwick of Jersey). Full details of all data sources and the case ascertainment procedure can be found in the accompanying Technical Document.

The UK total births is based on all births for the UK (irrespective of country of residence) whereas the number of births for each individual UK country and the Crown Dependencies is based on those births for which the country of residence of the mother was known.

Deaths included in reported mortality rates

This report focuses on **births from 24⁺⁰ weeks' gestational age**, with the exception of the chapter on mortality rates by gestational age, which includes information on births at 22⁺⁰ to 23⁺⁶ weeks' gestational age. 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. **All terminations of pregnancy have been excluded from the mortality rates reported.**

Report overview

This is the eighth MBRRACE-UK Perinatal Mortality Surveillance Report. The main report is divided into seven sections: perinatal mortality rates in the UK; variation in mortality rates for Trusts and Health Board comparator groups; mortality rates by gestational age; the effect of ethnicity and deprivation on perinatal mortality; the effect of twin pregnancy on perinatal mortality; causes of death; and the timeliness of notification of perinatal deaths.

Mortality rates for individual organisations, including Trusts and Health Boards, together with interactive maps, can be found online at: www.npeu.ox.ac.uk/mbrrace-uk/reports. Additional tables and figures can be found in the accompanying Tables and Figures document. This report should be read in conjunction with the accompanying Technical Document which contains full details of the MBRRACE-UK methodology, including case ascertainment and statistical methods. All these documents are available for download from the MBRRACE-UK website: www.npeu.ox.ac.uk/mbrrace-uk/reports.

Terminology

Throughout this report we use the terms ‘women’ and ‘mothers’. However, we acknowledge that it is not only people who identify as women who access perinatal services and that our recommendations apply to all people who are pregnant or have given birth. Likewise, use of the word ‘parents’ includes anyone who has the main responsibility of caring for a baby.

Key to colour coding

Recommendations from previous reports which are still relevant but require improved implementation, and the source of these recommendations, are cited within green boxes. Example:

Recommendation A

Previous recommendations requiring improved implementation are presented in green boxes.

MBRRACE-UK 2021

New recommendations which are not based on current national guidance and which have not been noted in previous reports or initiatives are shown in purple boxes. Example:

Recommendation B

New recommendations are presented in purple boxes.

Perinatal mortality rates in the UK: 2020

Key findings

1. Extended perinatal mortality has reduced by 20% over seven years, from 6.04 per 1,000 total births in 2013 to 4.85 per 1,000 total births in 2020, equivalent to approximately 820 fewer deaths in 2020.
2. Stillbirth rates have reduced by 21% from 4.20 per 1,000 total births in 2013 to 3.33 per 1,000 total births in 2020, representing approximately 605 fewer stillbirths in 2020.
3. Neonatal mortality has reduced by 17% from 1.84 per 1,000 live births in 2013 to 1.53 deaths per 1,000 live births in 2020, representing approximately 215 fewer neonatal deaths in 2020 and an increased rate of reduction.

Data presented

1. **Rates of stillbirth, neonatal death, and extended perinatal death (stillbirth and neonatal deaths combined) for births that occurred in 2020 at 24⁺⁰ weeks' gestational age or later (excluding terminations of pregnancy) for the UK and the devolved nations based on the mother's country of residence.**
2. **Quarterly rates of stillbirth, neonatal death, and extended perinatal death (stillbirth and neonatal deaths combined) for births at 24⁺⁰ weeks' gestational age or later (excluding terminations of pregnancy) for the UK and the devolved nations based on the mother's country of residence, 2016 to 2020.**
3. **Trends in stillbirth, neonatal mortality and extended perinatal mortality rates for the UK and the devolved nations over the eight years of the MBRRACE-UK programme, 2013 to 2020.**

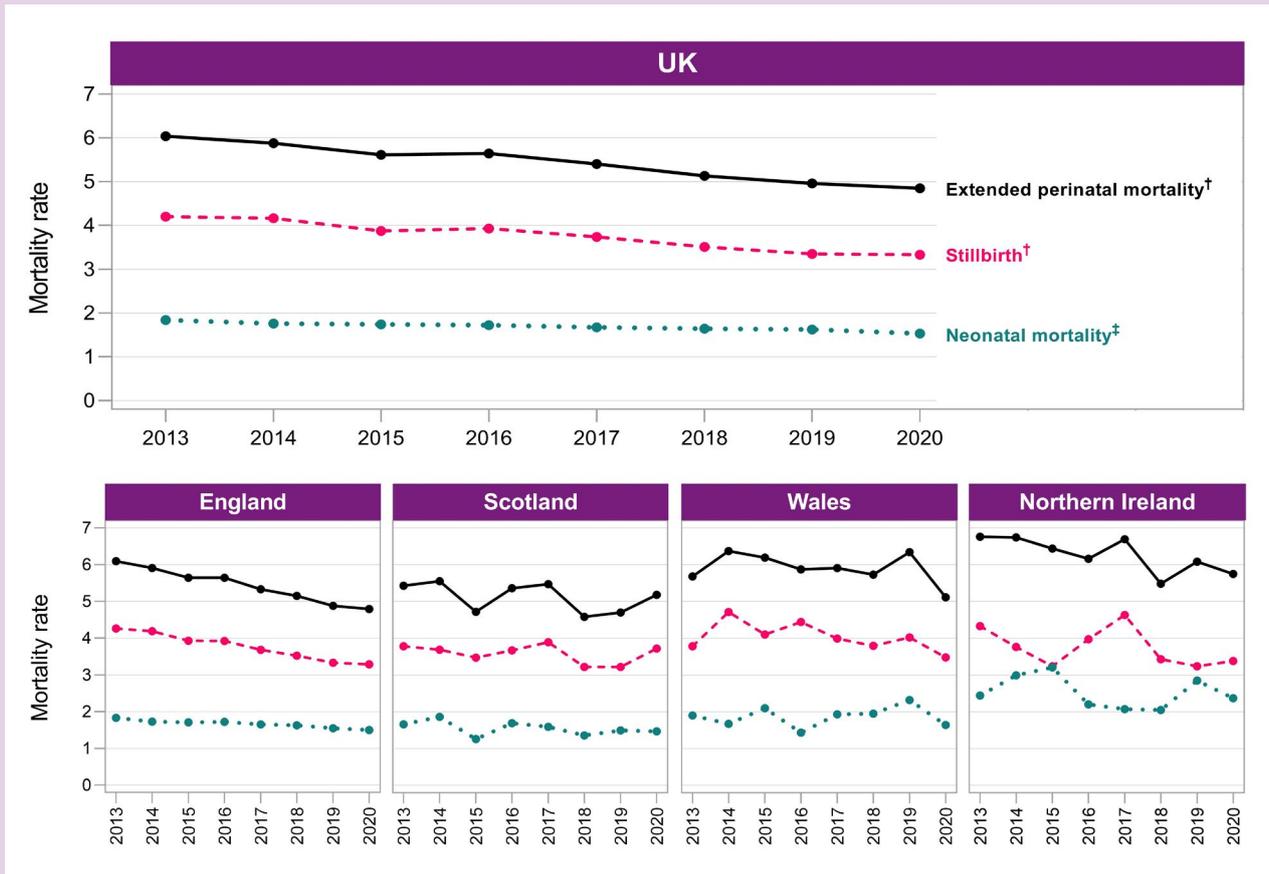
Results

1. Since 2013 there has been a year on year reduction in both the total number of stillbirths and the total number of neonatal deaths, and this trend has continued in 2020: 2,292 stillbirths in 2020 compared with 2,399 in 2019 and 2,579 in 2018, and 1,051 neonatal deaths in 2020 compared with 1,158 in 2019 and 1,199 in 2018. The extended perinatal mortality rate for 2020 across the UK as a whole was 4.85 per 1,000 total births (4.96 in 2019); comprising 3.33 stillbirths per 1,000 total births (3.35 in 2019) and 1.53 neonatal deaths per 1,000 live births (1.62 in 2019) (Figure 1 and Table 4). The year on year reduction in neonatal mortality rates has increased in 2020, with a reduction of 0.9 per 1,000 live births compared to 2019, following reductions of between 0.5 and 0.2 per 1,000 live births per year over the preceding five years.
2. Over the same period, there has been a steady reduction in the total number of births at 24⁺⁰ weeks or greater gestational age (excluding terminations of pregnancy) for the UK, from 781,932 to 689,004 in 2020: an overall reduction of 92,928 (11.9%) births (Table 1).
3. Across the four UK nations the lowest stillbirth rate in 2020 was in England (3.29 per 1,000 total births) whilst the lowest rate of neonatal mortality was in Scotland (1.47 per 1,000 live births compared with 1.49 in 2019) (Table 2).
4. For stillbirths the highest rate in 2020 was in Scotland (3.72 per 1,000 total births) whilst the highest neonatal mortality rate was in Northern Ireland (2.37 per 1,000 live births) (Table 2). However, it is important to note that during this period stillbirth and, in particular, neonatal mortality rates in Northern Ireland were still influenced by differences in the law relating to termination of pregnancy, with more babies affected by major congenital anomalies being carried into the later stages of pregnancy and resulting in early neonatal deaths. Whilst the law in Northern Ireland was changed on 21st October 2019, decriminalising abortion in defined circumstances, legislation governing the provision of abortion services did not come into force until 31st March 2020. Abortion services were not commissioned or funded during the period reported.
5. As in previous years the number of babies born in the Crown Dependencies is too few to permit reliable comparison with the four countries of the UK.
6. The overall reduction in stillbirth, neonatal and extended perinatal mortality the UK since 2013 is presented in Table 4 and Figure 1. This shows a fall of 21% in the stillbirth rate, 17% in the neonatal mortality rate and 20% in the extended perinatal mortality rate, across the duration of the MBRRACE-UK programme. As over 85% of UK births occur in England this overall pattern reflects a decline over the eight year period in England but with less evidence of change

over time in the remaining devolved nations where rates show more year on year variation due to their smaller population sizes.

- In order to investigate the impact of the COVID-19 pandemic on stillbirth, neonatal mortality and extended perinatal mortality rates in 2020 quarterly rates are presented for 2016 to 2020 in Table 3 and Figure 2. Rates of extended perinatal mortality and antepartum stillbirths remained fairly stable over the last three quarters of 2020 (the period affected by the pandemic) with the neonatal mortality rate showing a continued decline over the same period. Similarly, despite the effect of the pandemic on the provision of services the intrapartum stillbirth rate showed a continued slow decline over the last three quarters of 2020.

Figure 1: Stillbirth, neonatal, and extended perinatal mortality rates for the UK and by country of residence: United Kingdom, for births from 2013 to 2020



† per 1,000 total births

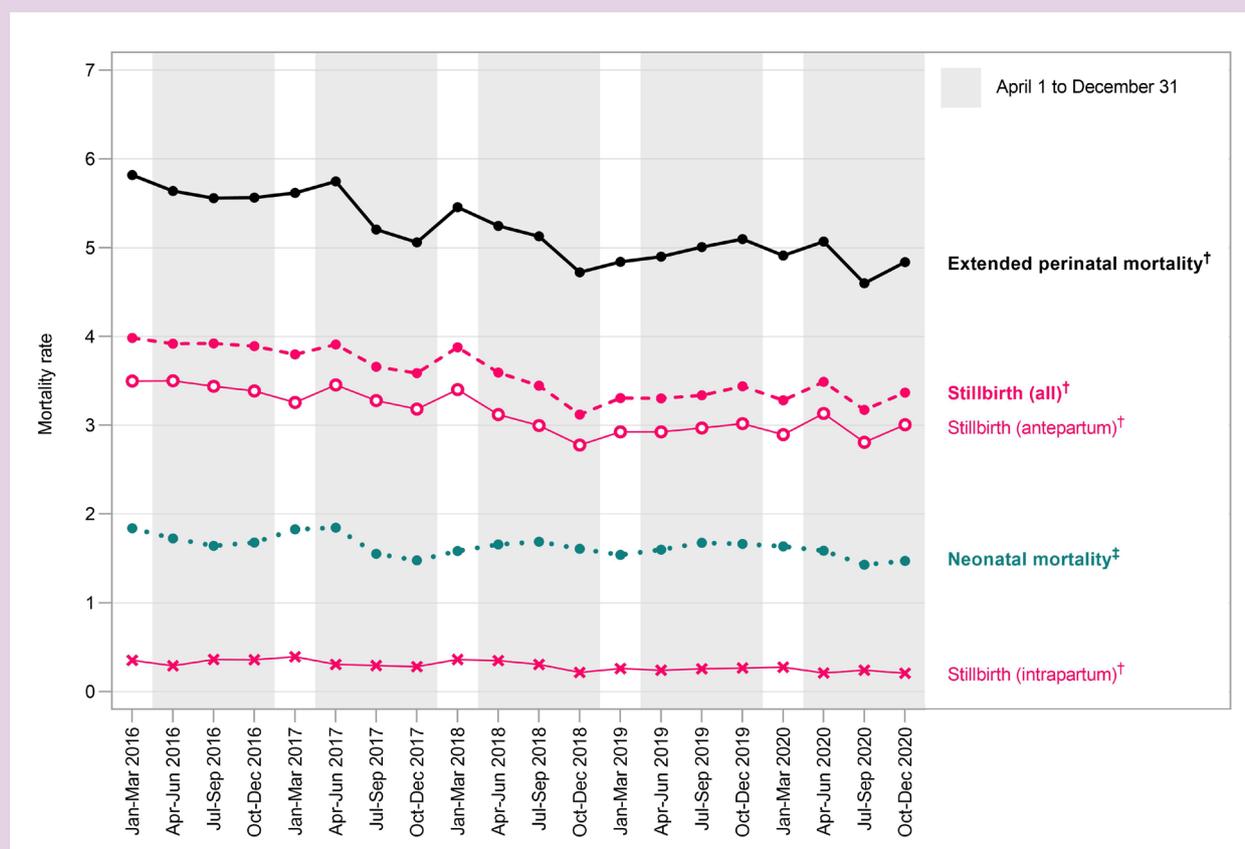
‡ per 1,000 live births

Excluding terminations of pregnancy and births <24⁺⁰ weeks' gestational age

New legislation on termination of pregnancy in Northern Ireland (Abortion (Northern Ireland) Regulations 2020) became law on 31st March 2020

Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey

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Figure 2: Stillbirth, neonatal, and extended perinatal mortality rates by quarter: United Kingdom and Crown Dependencies, for births from 2016 to 2020

† per 1,000 total births

‡ per 1,000 live births

Excluding terminations of pregnancy and births <24⁺⁰ weeks' gestational ageNew legislation on termination of pregnancy in Northern Ireland (Abortion (Northern Ireland) Regulations 2020) became law on 31st March 2020

Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey

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Table 1: Number of births, stillbirths, neonatal deaths, and extended perinatal deaths by country of residence: United Kingdom and Crown Dependencies, for births in 2020

Births and perinatal deaths	Number [§]					
	UK [^]	England	Scotland	Wales	Northern Ireland ^o	Crown Dep.
Total births	689,004	588,731	47,845	28,756	21,569	2,034
Live births	686,712	586,792	47,667	28,656	21,496	2,032
Stillbirths	2,292	1,939	178	100	73	2
Antepartum	2,039	1,719	161	93	64	2
Intrapartum	161	141	9	5	6	0
Unknown timing	92	79	8	2	3	0
Neonatal deaths	1,051	880	70	47	51	3
Early neonatal deaths	676	567	42	27	39	1
Late neonatal deaths	375	313	28	20	12	2
Perinatal deaths	2,968	2,506	220	127	112	3
Extended perinatal deaths	3,343	2,819	248	147	124	5

§ excluding terminations of pregnancy and births <24⁺⁰ weeks' gestational age[^] including the Crown Dependencies and mothers with unknown residency^o New legislation on termination of pregnancy in Northern Ireland (Abortion (Northern Ireland) Regulations 2020) became law on 31st March 2020

Data sources: MBRRACE-UK, ONS, PDS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey

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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 2020

Perinatal deaths	Rate per 1,000 births (CI) [§]					
	UK [†]	England	Scotland	Wales	Northern Ireland [°]	Crown Dep.
Stillbirths[†]	3.33 (3.19 to 3.46)	3.29 (3.15 to 3.44)	3.72 (3.17 to 4.27)	3.48 (2.8 to 4.16)	3.38 (2.61 to 4.16)	0.98 (0 to 2.35)
Antepartum [†]	2.96 (2.83 to 3.09)	2.92 (2.78 to 3.06)	3.37 (2.85 to 3.88)	3.23 (2.58 to 3.89)	2.97 (2.24 to 3.69)	0.98 (0 to 2.35)
Intrapartum [†]	0.23 (0.2 to 0.27)	0.24 (0.2 to 0.28)	0.19 (0.07 to 0.31)	0.17 (0.02 to 0.33)	0.28 (0.06 to 0.5)	0.00 (0 to 1.47)
Unknown timing [†]	0.13 (0.11 to 0.16)	0.13 (0.1 to 0.16)	0.17 (0.05 to 0.28)	0.07 (0 to 0.17)	0.14 (0 to 0.3)	0.00 (0 to 1.47)
Neonatal deaths[‡]	1.53 (1.44 to 1.62)	1.50 (1.4 to 1.6)	1.47 (1.12 to 1.81)	1.64 (1.17 to 2.11)	2.37 (1.72 to 3.02)	1.48 (0 to 3.15)
Early neonatal deaths [‡]	0.98 (0.91 to 1.06)	0.97 (0.89 to 1.05)	0.88 (0.61 to 1.15)	0.94 (0.59 to 1.3)	1.81 (1.25 to 2.38)	0.49 (0 to 1.46)
Late neonatal deaths [‡]	0.55 (0.49 to 0.6)	0.53 (0.47 to 0.59)	0.59 (0.37 to 0.8)	0.70 (0.39 to 1)	0.56 (0.24 to 0.87)	0.98 (0 to 2.35)
Perinatal deaths[†]	4.31 (4.15 to 4.46)	4.26 (4.09 to 4.42)	4.60 (3.99 to 5.2)	4.42 (3.65 to 5.18)	5.19 (4.23 to 6.15)	1.47 (0 to 3.14)
Extended perinatal deaths[†]	4.85 (4.69 to 5.02)	4.79 (4.61 to 4.96)	5.18 (4.54 to 5.83)	5.11 (4.29 to 5.94)	5.75 (4.74 to 6.76)	2.46 (0.31 to 4.61)

[†] per 1,000 total births

[‡] per 1,000 live births

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

[°] New legislation on termination of pregnancy in Northern Ireland (Abortion (Northern Ireland) Regulations 2020) became law on 31st March 2020

[^] including the Crown Dependencies and mothers with unknown residency

Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey

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Table 3: Stillbirth, neonatal, and extended perinatal mortality rates by quarter: United Kingdom and Crown Dependencies, for births from 2016 to 2020

Year	Quarter	Number [§]				
		Rate per 1,000 births				
		Stillbirths [†]			Neonatal deaths [‡]	Extended perinatal deaths [†]
		All	Antepartum	Intrapartum		
2016	Jan-Mar	756	664	67	348	1,104
		3.98	3.50	0.35	1.84	5.82
	Apr-Jun	768	686	57	337	1,105
		3.92	3.50	0.29	1.73	5.64
	Jul-Sep	794	696	73	331	1,125
		3.92	3.44	0.36	1.64	5.56
	Oct-Dec	747	650	69	321	1,068
		3.89	3.39	0.36	1.68	5.56
2017	Jan-Mar	697	598	72	334	1,031
		3.80	3.26	0.39	1.83	5.62
	Apr-Jun	740	654	58	348	1,088
		3.91	3.46	0.31	1.85	5.75
	Jul-Sep	723	648	58	306	1,029
		3.66	3.28	0.29	1.55	5.21
	Oct-Dec	680	603	53	279	959
		3.59	3.18	0.28	1.48	5.06
2018	Jan-Mar	689	604	64	280	969
		3.88	3.40	0.36	1.58	5.46
	Apr-Jun	661	574	64	304	965
		3.59	3.12	0.35	1.66	5.25
	Jul-Sep	655	570	58	320	975
		3.44	3.00	0.31	1.69	5.13
	Oct-Dec	574	511	40	295	869
		3.12	2.78	0.22	1.61	4.72
2019	Jan-Mar	573	507	45	266	839
		3.31	2.92	0.26	1.54	4.84
	Apr-Jun	591	523	43	285	876
		3.31	2.92	0.24	1.60	4.90
	Jul-Sep	625	556	48	313	938
		3.34	2.97	0.26	1.68	5.01
	Oct-Dec	610	535	47	294	904
		3.44	3.02	0.27	1.66	5.10
2020	Jan-Mar	561	495	47	279	840
		3.28	2.89	0.27	1.64	4.91
	Apr-Jun	598	537	36	271	869
		3.49	3.13	0.21	1.59	5.07
	Jul-Sep	564	499	43	253	817
		3.17	2.81	0.24	1.43	4.60
	Oct-Dec	569	508	35	248	817
		3.37	3.01	0.21	1.47	4.84

† per 1,000 total births

‡ per 1,000 live births

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

^ including the Crown Dependencies and mothers with unknown residency

Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey

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Table 4: Stillbirth, neonatal, and extended perinatal mortality rates (95% confidence intervals (CIs)): United Kingdom and Crown Dependencies, for births from 2013 to 2020

Year	Rate per 1,000 births (CI) [§]					
	Stillbirths [†]		Neonatal deaths [‡]		Extended perinatal deaths [†]	
2013	4.20	(4.06 to 4.35)	1.84	(1.75 to 1.94)	6.04	(5.87 to 6.21)
2014	4.12	(3.98 to 4.33)	1.76	(1.67 to 1.86)	5.88	(5.71 to 6.04)
2015	3.87	(3.73 to 4.01)	1.74	(1.65 to 1.84)	5.61	(5.44 to 5.77)
2016	3.93	(3.79 to 4.07)	1.72	(1.63 to 1.81)	5.64	(5.48 to 5.28)
2017	3.74	(3.60 to 3.87)	1.67	(1.58 to 1.77)	5.40	(5.24 to 5.57)
2018	3.51	(3.37 to 3.64)	1.64	(1.54 to 1.73)	5.13	(4.97 to 5.30)
2019	3.35	(3.21 to 3.48)	1.62	(1.53 to 1.71)	4.96	(4.80 to 5.12)
2020	3.33	(3.19 to 3.46)	1.53	(1.44 to 1.62)	4.85	(4.69 to 5.02)

[§] excluding terminations of pregnancy and births <24⁰ weeks' gestational age

[†] per 1,000 total births

[‡] per 1,000 live births

Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey

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Implications

Previous MBRRACE-UK reports have identified the initiatives in place to reduce perinatal mortality in all four UK nations [1-4]. The English Department of Health's ambition to reduce mortality rates by 20% by 2020 [2] has been met for stillbirths, which show a 21% reduction since the start of the MBRRACE-UK perinatal surveillance programme in 2013. Neonatal mortality rates have shown an increased rate of reduction in 2020 resulting in a 17% reduction over the 2013-2020 period. Whilst both stillbirth and neonatal mortality rates have shown a steady decrease over time the rate of reduction needs to be significantly increased in order to achieve the English Department of Health's revised ambition of a 50% reduction in mortality rates by 2025, which would be in line with the rates of similar high income countries.

Continued learning from the results of confidential enquiries and local and national findings from the Perinatal Mortality Review Tool is required in order to improve the quality of service provision at all points of the care pathway. Failures to follow guidance and standards at local level can be addressed by developing 'strong' actions targeted at system-level changes which remove the reliance on individuals to choose the correct action, followed by local auditing of their implementation and impact. Data from the national Perinatal Mortality Review Tool shows that only a very small proportion of actions are currently identified as 'strong' [5]. In addition, given the wide inequalities in social deprivation and for Black and Asian ethnic groups (see *Effect of ethnicity and deprivation on perinatal mortality*, pages 18-23) new targeted initiatives need to be developed alongside improved strategies to reduce obesity and smoking during pregnancy [5-8].

The UK has higher preterm birth rates than other EU or similar high income countries. Despite having similar outcomes for preterm births [9, 10] the higher rate (and consequent numbers) of very preterm birth in the UK results in high neonatal mortality rates. Work to reduce the preterm birth rate therefore remains a priority for all UK nations. Further examination of the effect of gestational age on perinatal mortality is presented on pages 14-17.

The COVID-19 pandemic has had a major impact on service provision and the ability of the population to access services. This affected pregnant women and people and their babies. The first national 'lockdown' due to the pandemic began towards the end of March 2020. Changes to maternity services access or a reluctance to attend hospital could potentially have led to an increase in mortality rates. However, the antepartum stillbirth rate remained fairly stable both over the April to December 2020 period and compared to previous years. Intrapartum stillbirth rates and neonatal mortality rates continued to decline over the latter three quarters of 2020 despite the access changes and the additional issue of increasing staff sickness levels due to the pandemic. Overall, it therefore appears that there was little effect of the pandemic on stillbirth and neonatal mortality rates over the first nine months of the COVID-19 pandemic.

Recommendation from previous reports requiring improved implementation

Enhance current programmes in order to accelerate the reduction of stillbirths and neonatal deaths to meet national targets, with an emphasis on reducing rates of preterm birth, particularly the most extreme preterm group.

MBRRACE-UK 2021 [11]

Perinatal mortality rates for Trusts and Health Boards

Revised 27th October 2022

Key findings

1. After adjustment for risk factors and unit size, stillbirth rates show increased variation between Trusts and Health Boards compared to previous years, with only 60% of stabilised & adjusted rates for all organisations falling within 5% of their comparator group average.
2. Stabilised & adjusted neonatal mortality rates for organisations that care for the most complex pregnancies and births show wide variation: only 19% of Trusts and Health Boards with a Level 3 Neonatal Intensive Care Unit (NICU) and neonatal surgical provision had a stabilised & adjusted neonatal mortality rate within 5% of their comparator group average.
3. Unlike previous years, the exclusion of deaths due to congenital anomalies had little effect on the variation in stabilised & adjusted stillbirth rates, with only 57% of Trusts and Health Boards falling within 5% of their comparator group average.
4. Exclusion of deaths due to congenital anomalies reduced the variation in stabilised & adjusted neonatal mortality rates, with 58% of Trusts and Health Boards with a Level 3 Neonatal Intensive Care Unit (NICU) and neonatal surgical provision having a stabilised & adjusted neonatal mortality rate within 5% of their comparator group average.

Data presented

Variation in stabilised & adjusted rates of stillbirth and neonatal death for births that occurred in 2020 at 24⁺⁰ weeks' gestational age or later (excluding terminations of pregnancy) by Trust and Health Board, with and without deaths due to congenital anomalies.

As in previous years, to account for the wide variation in case-mix, Trusts and Health Boards were 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 24 weeks or later;
4. 2,000-3,999 births per annum at 24 weeks or later;
5. Under 2,000 births per annum at 24 weeks or later.

In order to compare Trusts and Health Boards more fairly, **stabilised & adjusted mortality rates** are calculated. 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. 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 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). A complete explanation of the MBRRACE-UK methodology, including statistical methods, can be found in the accompanying Technical Document.

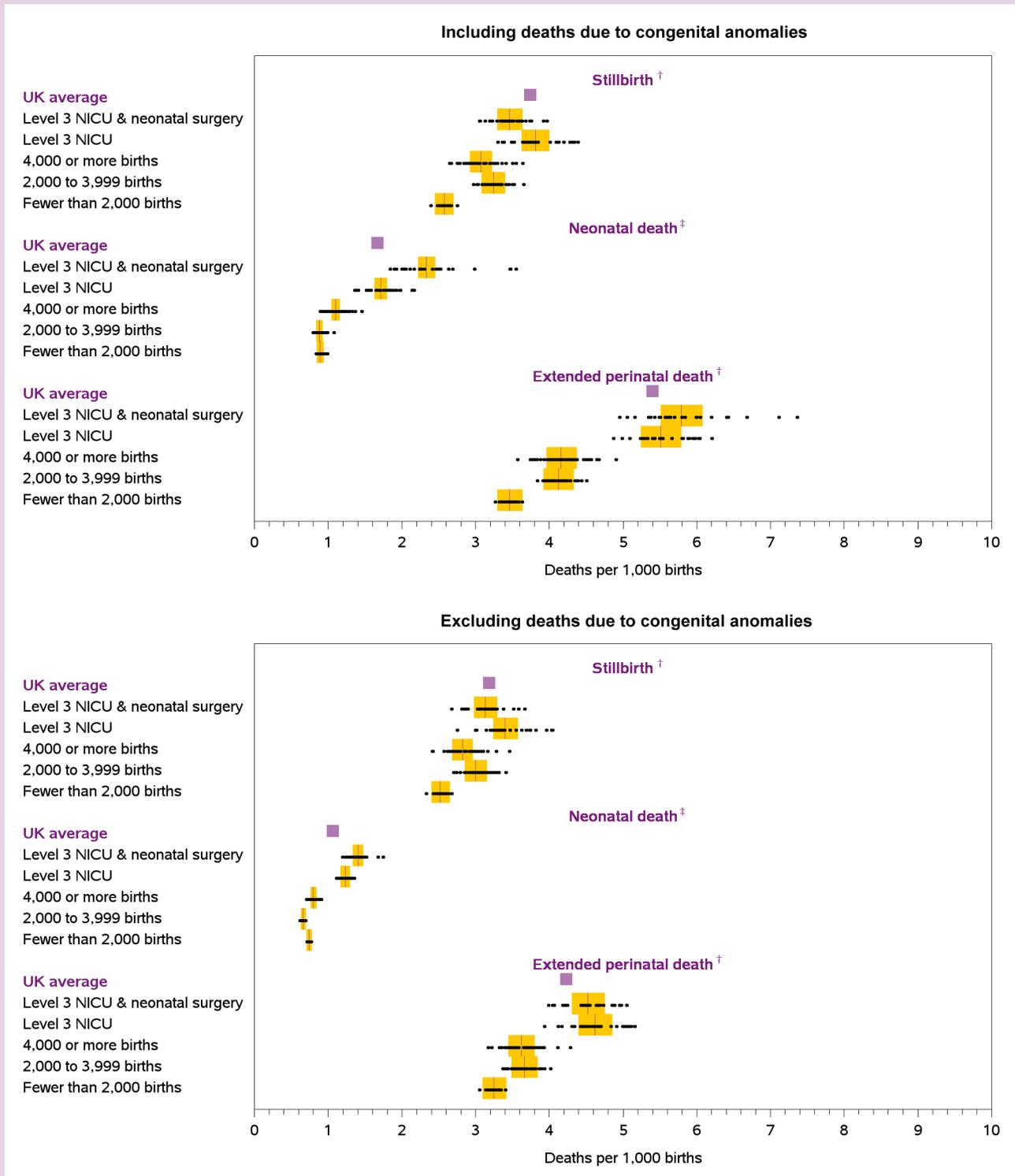
Crude and stabilised & adjusted rates for individual Trusts and Health Boards, with and without deaths due to congenital anomalies, can be found in the accompanying interactive maps and tables available at: www.npeu.ox.ac.uk/mbrpace-uk/reports. Mortality rates for organisations are colour-coded according to the variation from their respective comparator group average:

- Green: organisational mortality rate is more than 15% lower than the group average.
- Yellow: organisational mortality rate is more than 5% and up to 15% lower than the group average.
- Amber: organisational mortality rate is up to 5% higher or up to 5% lower than the group average.
- Red: organisational mortality rate is more than 5% higher than the group average.

Results

1. The extent to which the hierarchical classification of Trusts and Health Boards reflects the risk profiles of the different types of unit is presented in Figure 3 and Tables 5 and 6. In 2020 stabilised & adjusted stillbirth rates showed greater variation than in previous years, with 17% of Trusts and Health Boards having a stabilised & adjusted stillbirth rate more than 5% and up to 15% lower than their comparator group average, and 23% having a rate more than 5% higher than the average. As a consequence, only 60% of Trusts and Health Boards had a stabilised & adjusted stillbirth rate within 5% of their comparator group average (85% in 2018 and 97% in 2019).
2. Stabilised & adjusted neonatal mortality rates continued to show wide variation with only 35% of Trusts and Health Boards falling within 5% of their comparator group average (31% in 2018 and 26% in 2019).
3. Stabilised & adjusted stillbirth rates for Trusts and Health Boards across the UK ranged from 3.06 to 3.97 per 1,000 total births for those with a Level 3 NICU and neonatal surgery and from 2.39 to 2.75 for Trusts and Health Boards with under 2,000 births per annum.
4. Stabilised & adjusted neonatal mortality rates for Trusts and Health Boards across the UK ranged from 1.84 to 3.55 per 1,000 live births for those with a Level 3 NICU and neonatal surgery and from 0.79 to 1.08 for Trusts and Health Boards with 2,000-3,999 births per annum.
5. Exclusion of deaths due to congenital anomalies has little effect on variation in stabilised & adjusted stillbirth rates compared to the comparator group average, with 57% of Trusts and Health Boards falling within 5% of the group average (range 2.33 to 4.05 per 1,000 total births across all types of unit).
6. Compared to previous years, exclusion of deaths due to congenital anomalies has a greater impact on the variation in stabilised & adjusted neonatal mortality rates, with 68% of Trusts and Health Boards having a rate within 5% of their comparator group average (Table 6). Once deaths due to congenital anomalies are excluded 58% of Trusts and Health Boards with a Level 3 NICU and neonatal surgery fall within 5% of their group average (range 1.20 to 1.75 per 1,000 live births). Overall, 17% of eligible Trusts and Health Boards (26 out of 154) had a neonatal mortality rate over 5% higher than the comparator average when congenital anomalies are excluded, compared with 35% of Trusts and Health Boards in 2019.

Figure 3: Stabilised & adjusted stillbirth, neonatal and extended perinatal mortality rates for Trusts and Health Boards by comparator group, including and excluding deaths due to congenital anomalies: United Kingdom and Crown Dependencies, for births in 2020



The amber band represents up to 5% higher or up to 5% lower than the comparator group average mortality rate.

† 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, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey

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Table 5: Stabilised & adjusted stillbirth rates for Trusts and Health Boards by comparator group, including and excluding deaths due to congenital anomalies: United Kingdom and Crown Dependencies, for births in 2020

Comparator group		Stillbirth rate [†]				Number of organisations in colour band*			
		Lowest rate	Highest rate	Group average	UK average	Green	Yellow	Amber	Red
Level 3 NICU and neonatal surgery	Including congenital anomalies	3.06	3.97	3.46	3.34	0	6	14	6
	Excluding congenital anomalies	2.68	3.67	3.13	3.05	0	6	15	5
Level 3 NICU	Including congenital anomalies	3.30	4.39	3.81	3.34	0	5	14	9
	Excluding congenital anomalies	2.75	4.05	3.40	3.05	1	6	13	8
4,000 or more births	Including congenital anomalies	2.65	3.64	3.07	3.34	0	10	19	12
	Excluding congenital anomalies	2.42	3.46	2.82	3.05	0	12	17	12
2,000-3,999 births	Including congenital anomalies	2.97	3.65	3.24	3.34	0	4	28	7
	Excluding congenital anomalies	2.70	3.41	3.00	3.05	0	5	25	9
Under 2,000 births	Including congenital anomalies	2.39	2.75	2.57	3.34	0	1	18	1
	Excluding congenital anomalies	2.33	2.67	2.52	3.05	0	1	18	1
All groups	Including congenital anomalies	2.39	4.39	N/A	3.34	0	26	93	35
	Excluding congenital anomalies	2.33	4.05	N/A	3.05	1	30	88	35

Excluding terminations of pregnancy and births <24⁺⁰ weeks' gestational age
[†] per 1,000 total births

* Colours represent variation from comparator group average stillbirth rate:

- Green: more than 15% lower than the average
- Yellow: more than 5% and up to 15% lower than the average
- Amber: up to 5% higher or up to 5% lower than the average
- Red: more than 5% higher than the average

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Table 6: Stabilised & adjusted neonatal mortality rates for Trusts and Health Boards by comparator group, including and excluding deaths due to congenital anomalies: United Kingdom and Crown Dependencies, for births in 2020

Comparator group		Neonatal mortality rate [‡]				Number of organisations in colour band *			
		Lowest rate	Highest rate	Group average	UK average	Green	Yellow	Amber	Red
Level 3 NICU and neonatal surgery	Including congenital anomalies	1.84	3.55	2.33	1.54	5	6	5	10
	Excluding congenital anomalies	1.20	1.75	1.40	1.03	0	5	15	6
Level 3 NICU	Including congenital anomalies	1.36	2.17	1.71	1.54	3	7	6	12
	Excluding congenital anomalies	1.11	1.35	1.23	1.03	0	6	14	8
4,000 or more births	Including congenital anomalies	0.89	1.46	1.10	1.54	3	14	8	16
	Excluding congenital anomalies	0.71	0.90	0.80	1.03	0	11	20	10
2,000-3,999 births	Including congenital anomalies	0.79	1.08	0.88	1.54	0	9	20	10
	Excluding congenital anomalies	0.62	0.69	0.66	1.03	0	1	36	2
Under 2,000 births	Including congenital anomalies	0.84	0.99	0.89	1.54	0	2	15	3
	Excluding congenital anomalies	0.72	0.77	0.74	1.03	0	0	20	0
All groups	Including congenital anomalies	0.79	3.55	N/A	1.54	11	38	54	51
	Excluding congenital anomalies	0.62	1.75	N/A	1.03	0	23	105	26

Excluding terminations of pregnancy and births <24⁺⁰ weeks' gestational age
[‡] per 1,000 live births

* Colours represent variation from comparator group average neonatal mortality rate:

- Green: more than 15% lower than the average
- Yellow: more than 5% and up to 15% lower than the average
- Amber: up to 5% higher or up to 5% lower than the average
- Red: more than 5% higher than the average

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Implications

Each year we produce stabilised & adjusted stillbirth and neonatal mortality rates for five different categories of Trusts and Health Boards to allow for a more fair comparison between similar units. These rates account for both unit size and the case mix of the population served by each hospital. Findings were completely different in 2020 compared to previous years, with greater variation in stillbirth rates noted between units than shown previously: 69% of rates falling within 5% of the comparator group average compared to 97% in 2019. Exclusion of deaths due to congenital anomalies also had minimal impact on stillbirth rates. This increased variation may reflect differences in organisational measures established to address the pandemic at Trust and Health Board level as well as problems with staffing levels due to sickness and retention.

Overall neonatal mortality rates show wide variation, particularly between Trusts and Health Boards with Level 3 NICUs, with or without neonatal surgery, where babies at the highest risk of mortality are treated. In 2020, following the exclusion of deaths due to congenital anomalies, this variation was significantly reduced across all comparator groups; from 35% of neonatal mortality rates falling within 5% of the comparator average in 2019 to 64% in 2020.

Investigations into the reasons for this wide variation for both stillbirth and neonatal mortality rates should continue to be carried out at local, organisation and population levels to determine whether this is a lack of appropriate resourcing to address local population characteristics, which may include deprivation and ethnicity [12], organisational issues during the pandemic period, or quality of care provision. Unit review of their quality of care provision using the Perinatal Mortality Review Tool should provide insight into areas where improvements are required, as well as identifying best practice.

Recommendation 1

Commission a review of evidence in order to enhance perinatal services for disadvantaged populations to reduce inequitable outcomes.

Recommendations from previous reports requiring improved implementation

Use the MBRRACE-UK real-time data monitoring tool and interactive maps and tables as part of regular mortality meetings to help identify why an organisation's stabilised & adjusted stillbirth, neonatal mortality or extended perinatal mortality rate falls into the red or amber band.

MBRRACE-UK 2020 [13]

Investigate potential modifiable factors in the treatment of neonates when an organisation's stabilised & adjusted neonatal mortality rate falls into the red or amber bands after exclusion of deaths due to congenital anomalies. Ensure that this encompasses both local population characteristics and quality of care provision.

MBRRACE-UK 2020 [13]

Mortality rates by gestational age

Key findings

1. The overall reduction in the stillbirth rate is mainly due to a reduction in the rate of term stillbirths by 19%, from 1.52 per 1,000 total births in 2016 to 1.23 in 2020 (an increase from 1.17 in 2019). There was a reduction in the rate of stillbirth for all preterm births from 2016 to 2020.
2. The largest reduction in the neonatal mortality rate was for extremely preterm births (24⁺⁰ to 27⁺⁶ weeks' gestational age), a 14% reduction from 158.9 per 1,000 live births in 2016 to 135.6 in 2020. However, for very preterm births (28⁺⁰ to 31⁺⁶ weeks' gestational age) the neonatal mortality rate has slightly increased from 29.0 to 30.6 per 1,000 live births over the same period.
3. Almost three-quarters of both stillbirths and neonatal deaths (including babies born at 22-23 weeks' gestational age) were preterm births (<37 weeks' gestational age): 73% and 71% respectively.
4. In 2020, 34% of reported stillbirths and late fetal losses and 43% of neonatal deaths occurred in babies who were born extremely preterm (22⁺⁰ to 27⁺⁶ weeks' gestational age).
5. Numbers and rates of post-term births (≥42 weeks' gestational age) remained low and stable over the period 2016 to 2020.

Data presented

1. **Annual rates of stillbirth (including late fetal losses), neonatal death, and extended perinatal death (stillbirth and neonatal deaths combined) for births that occurred from 2016 to 2020 at 22⁺⁰ weeks' gestational age or later (excluding terminations of pregnancy) in the UK, by gestational age.**
2. **Quarterly rates of stillbirth (including late fetal losses), neonatal death, and extended perinatal death (stillbirth and neonatal deaths combined) for births that occurred from 2016 to 2020 at 22⁺⁰ weeks' gestational age or later (excluding terminations of pregnancy) in the UK, by gestational age.**

Births with missing gestational age information were excluded (n=33,335 in 2020; 5% of births).

Results

1. Table 7 shows the continued impact of preterm birth in relation to both stillbirth and neonatal death rates in the UK, with data for 2020 showing that almost three-quarters of stillbirths (including late fetal losses) and neonatal deaths were of babies born before 37 weeks' gestational age (73% and 71% respectively).
2. Including babies born at 22 to 23 weeks' gestational age, 34% of stillbirths and 43% of neonatal deaths in 2020 were extremely preterm (<28 weeks' gestational age), once again emphasising the impact of preterm birth in the UK.
3. The overall reduction in stillbirth and neonatal mortality rates, particularly the fall seen this year, is related to a reduction in the proportion of babies born before 32 weeks: from 1.44% in 2016 to 1.34% in 2020.
4. The greatest reduction in the stillbirth rate over the five year period is in extremely preterm babies (a 13% reduction at 22⁺⁰-23⁺⁶ weeks' gestational age and an 11% reduction at 24⁺⁰-27⁺⁶ weeks' gestational age). However, given the large reduction in the number of late fetal losses at 22 and 23 weeks' gestational age reported in 2020 (863 compared to over 1,000 in the previous four years) there could be under-reporting of this group of non-registerable births over the pandemic period.
5. Unlike in previous years, where the greatest reduction in the stillbirth rate was seen in babies born at 37⁺⁰ to 41⁺⁶ weeks, in 2020 the stillbirth rate for this group increased by 5% since 2019 following several years of consistent decline. Stillbirth rates have also risen by 6% for babies born from 28⁺⁰-31⁺⁶ weeks' gestational age over the same period.
6. As with stillbirths, the greatest reduction in neonatal deaths over the five year period is seen in extremely preterm babies (a 16% reduction at 24⁺⁰ to 27⁺⁶ weeks and a 12% reduction at 22⁺⁰ to 23⁺⁶ weeks' gestational age).

Table 7: Number and percentage of stillbirths and late fetal losses by gestational age at birth: United Kingdom and Crown Dependencies, for births from 2016 to 2020

		Gestational age at birth (weeks)		Stillbirths and late fetal losses [§]				
				2016	2017	2018	2019	2020
Preterm	Extremely preterm	22 ⁺⁰ -23 ⁺⁶	Births [§]	1,034	1,070	1,008	1,026	863
			Late fetal losses N (%)	529 (14.7)	530 (15.7)	508 (16.5)	514 (17.7)	393 (14.7)
			Rate [†]	511.6	495.3	504.0	501.0	455.4
		24 ⁺⁰ -27 ⁺⁶	Births [§]	3,260	3,166	3,028	2,907	2,603
			Stillbirths N (%)	717 (19.9)	710 (21.1)	665 (21.6)	604 (20.7)	516 (19.2)
			Rate [†]	219.9	224.3	219.6	207.8	198.2
	Very preterm	28 ⁺⁰ -31 ⁺⁶	Births [§]	6,616	6,512	6,062	5,934	5,330
			Stillbirths N (%)	512 (14.2)	482 (14.3)	467 (15.1)	417 (14.3)	389 (14.5)
			Rate [†]	77.4	74.0	77.0	70.3	73.0
	Moderate to late preterm	32 ⁺⁰ -36 ⁺⁶	Births [§]	50,365	50,251	48,150	46,483	41,920
			Stillbirths N (%)	786 (21.9)	730 (21.7)	658 (21.3)	635 (21.8)	645 (24.1)
			Rate [†]	15.6	14.5	13.7	13.7	15.4
Term	37 ⁺⁰ -41 ⁺⁶	Births [§]	678,089	660,948	637,257	625,255	591,565	
		Stillbirths N (%)	1031 (28.7)	894 (26.5)	772 (25)	733 (25.2)	725 (27.0)	
		Rate [†]	1.52	1.35	1.21	1.17	1.23	
	≥42	Births [§]	18,276	16,211	14,307	13,214	12,252	
		Stillbirths N (%)	19 (0.5)	22 (0.7)	15 (0.5)	8 (0.3)	13 (0.5)	
		Rate [†]	1.04	1.36	1.05	0.61	1.06	
Total births			757,640	738,158	709,812	694,819	654,533	

[§] excluding terminations of pregnancy and births with missing gestational age

[†] per 1,000 total births

Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey

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Table 8: Number and percentage of neonatal deaths by gestational age at birth: United Kingdom and Crown Dependencies, for births from 2016 to 2020

		Gestational age at birth (weeks)		Neonatal deaths [§]				
				2016	2017	2018	2019	2020
Preterm	Extremely preterm	22 ⁺⁰ -23 ⁺⁶	Live births [§]	505	540	500	512	470
			Neonatal deaths N (%)	360 (21.3)	386 (23.4)	356 (22.9)	337 (22.6)	305 (22.5)
			Rate [‡]	712.9	714.8	712.0	658.2	648.9
		24 ⁺⁰ -27 ⁺⁶	Live births [§]	2,543	2,456	2,363	2,303	2,087
			Neonatal deaths N (%)	404 (23.9)	365 (22.2)	342 (22)	349 (23.4)	283 (20.9)
			Rate [‡]	158.9	148.6	144.7	151.5	135.6
	Very preterm	28 ⁺⁰ -31 ⁺⁶	Live births [§]	6,104	6,030	5,595	5,517	4,941
			Neonatal deaths N (%)	177 (10.5)	187 (11.4)	167 (10.8)	160 (10.7)	151 (11.1)
			Rate [‡]	29.0	31.0	29.8	29.0	30.6
	Moderate to late preterm	32 ⁺⁰ -36 ⁺⁶	Live births [§]	49,579	49,521	47,492	45,848	41,275
			Neonatal deaths N (%)	275 (16.2)	270 (16.4)	244 (15.7)	241 (16.2)	221 (16.3)
			Rate [‡]	5.55	5.45	5.14	5.26	5.35
Term	37 ⁺⁰ -41 ⁺⁶	Live births [§]	677,058	660,054	636,485	624,522	590,840	
		Neonatal deaths N (%)	468 (27.6)	428 (26)	431 (27.8)	398 (26.7)	387 (28.5)	
		Rate [‡]	0.69	0.65	0.68	0.64	0.65	
	≥42	Live births [§]	18,257	16,189	14,292	13,206	12,239	
		Neonatal deaths N (%)	9 (0.5)	11 (0.7)	13 (0.8)	6 (0.4)	9 (0.7)	
		Rate [‡]	0.49	0.68	0.91	0.45	0.74	
Total live births			754,046	734,790	706,727	691,908	651,852	

[§] excluding terminations of pregnancy and births with missing gestational age

[‡] per 1,000 live births

Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey

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Table 9: Quarterly birth rates by gestational age at birth: United Kingdom and Crown Dependencies, for births from 2016 to 2020

Year	Quarter	Rate per 1,000 total births [§]					
		Extremely preterm		Very preterm	Moderate to late preterm	Term	
		22 ⁺⁰ -23 ⁺⁶	24 ⁺⁰ -27 ⁺⁶	28 ⁺⁰ -31 ⁺⁶	32 ⁺⁰ -36 ⁺⁶	37 ⁺⁰ -41 ⁺⁶	≥42
2016	Jan-Mar	1.31	4.46	9.11	65.9	894.8	24.4
	Apr-Jun	1.36	4.33	8.62	66.8	894.9	24.0
	Jul-Sep	1.33	4.15	8.20	65.0	896.8	24.5
	Oct-Dec	1.46	4.28	9.03	68.2	893.5	23.5
2017	Jan-Mar	1.49	4.34	8.87	67.8	895.6	21.9
	Apr-Jun	1.50	4.72	8.87	69.1	893.8	22.0
	Jul-Sep	1.50	4.09	8.75	66.2	896.9	22.5
	Oct-Dec	1.31	4.01	8.80	69.4	895.2	21.3
2018	Jan-Mar	1.50	4.43	8.50	69.5	895.9	20.1
	Apr-Jun	1.50	4.44	8.82	67.0	898.1	20.2
	Jul-Sep	1.39	4.13	8.30	66.5	898.8	20.8
	Oct-Dec	1.29	4.08	8.55	68.4	898.2	19.5
2019	Jan-Mar	1.69	4.14	8.89	68.3	898.2	18.8
	Apr-Jun	1.43	4.14	8.45	67.4	898.9	19.7
	Jul-Sep	1.23	4.21	8.16	64.8	901.9	19.7
	Oct-Dec	1.58	4.25	8.69	67.3	900.3	17.9
2020	Jan-Mar	1.47	4.18	8.48	65.5	902.8	17.5
	Apr-Jun	1.39	4.22	8.35	63.5	903.5	19.1
	Jul-Sep	1.26	3.64	7.78	63.4	904.7	19.2
	Oct-Dec	1.18	3.89	7.99	63.9	904.0	19.0

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

Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey

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Implications

As noted in our last report [11], the large reduction in stillbirth rates for term births provides evidence of the successful implementation of targeted initiatives across the four nations of the UK [1-4, 14]. Most of this work was initially focused on reducing term stillbirths and the impact is reflected in the largest rate of reduction of stillbirths being in this group. National initiatives e.g. version 2 of the Saving Babies' Lives Care Bundle, have expanded their focus to include the prevention of neonatal deaths and preterm births. A positive finding from the 2020 data is a reduction in the rate of stillbirth and neonatal mortality across nearly all preterm births with the greatest reductions being for the most extreme preterm stillbirth and neonatal mortality rates at <28 weeks' gestational age. There is a mixed picture for the more mature preterm births with very small increases or reductions in the stillbirth and neonatal mortality rates for babies born between 28 and 36 weeks' gestational age. Detailed evaluation of these initiatives would help identify where improvements or more focussed targeting of interventions should be applied. Data for post term births (≥42 weeks' gestational age) for 2020 shows a continuing fall in the numbers of births and fairly stable stillbirth and neonatal mortality rates suggesting that any potential access issues to services due to the pandemic had no impact on these rates.

The UK continues to have high rates of preterm birth compared to other European countries [15]. In order to tackle this issue we need to strengthen our intervention programmes to reduce preterm births. Standardised international and organisational comparisons using gestation specific mortality rates should be developed to facilitate the identification of best practice and areas for improvement. Healthcare professionals should use the MBRRACE-UK guidance for the assessment of signs of life in births before 24⁺⁰ weeks' gestational age [16] in order to standardise the reporting of outcomes for babies born at these gestations. Explanatory videos to accompany the guidance are now available for both clinicians and families at: <https://www.npeu.ox.ac.uk/mbrrace-uk/signs-of-life>.

Recommendation 2

Continue to evaluate and implement the national initiatives to reduce stillbirth and neonatal deaths and monitor their impact on reducing preterm birth, particularly the most extreme preterm group.

Recommendation from previous reports requiring improved implementation

Use the MBRRACE-UK guidance for the assessment of signs of life in births before 24⁺⁰ weeks' gestational age.

MBRRACE-UK 2021 [11]

Effect of ethnicity and deprivation on perinatal mortality

Key findings

1. Stillbirth and neonatal mortality rates increased with deprivation across all ethnic groups.
2. Stillbirth and neonatal mortality rates were lowest for babies of White ethnicity from the least deprived areas (2.78 stillbirths per 1,000 total births and 1.26 neonatal deaths per 1,000 live births).
3. The multiple impact of ethnicity and deprivation is highlighted by a stillbirth rate of 8.10 and 7.96 per 1,000 total births for babies of Black African and Black Caribbean ethnicity respectively from the most deprived areas.
4. Neonatal mortality rates were over 3 per 1,000 live births for babies of Pakistani and Black African ethnicity from the most deprived areas.
5. Due to considerably higher proportions of babies of Black African, Black Caribbean, Pakistani and Bangladeshi ethnicity being from more deprived areas, they are disproportionately affected by the higher rates of stillbirth and neonatal death associated with deprivation.

Data presented

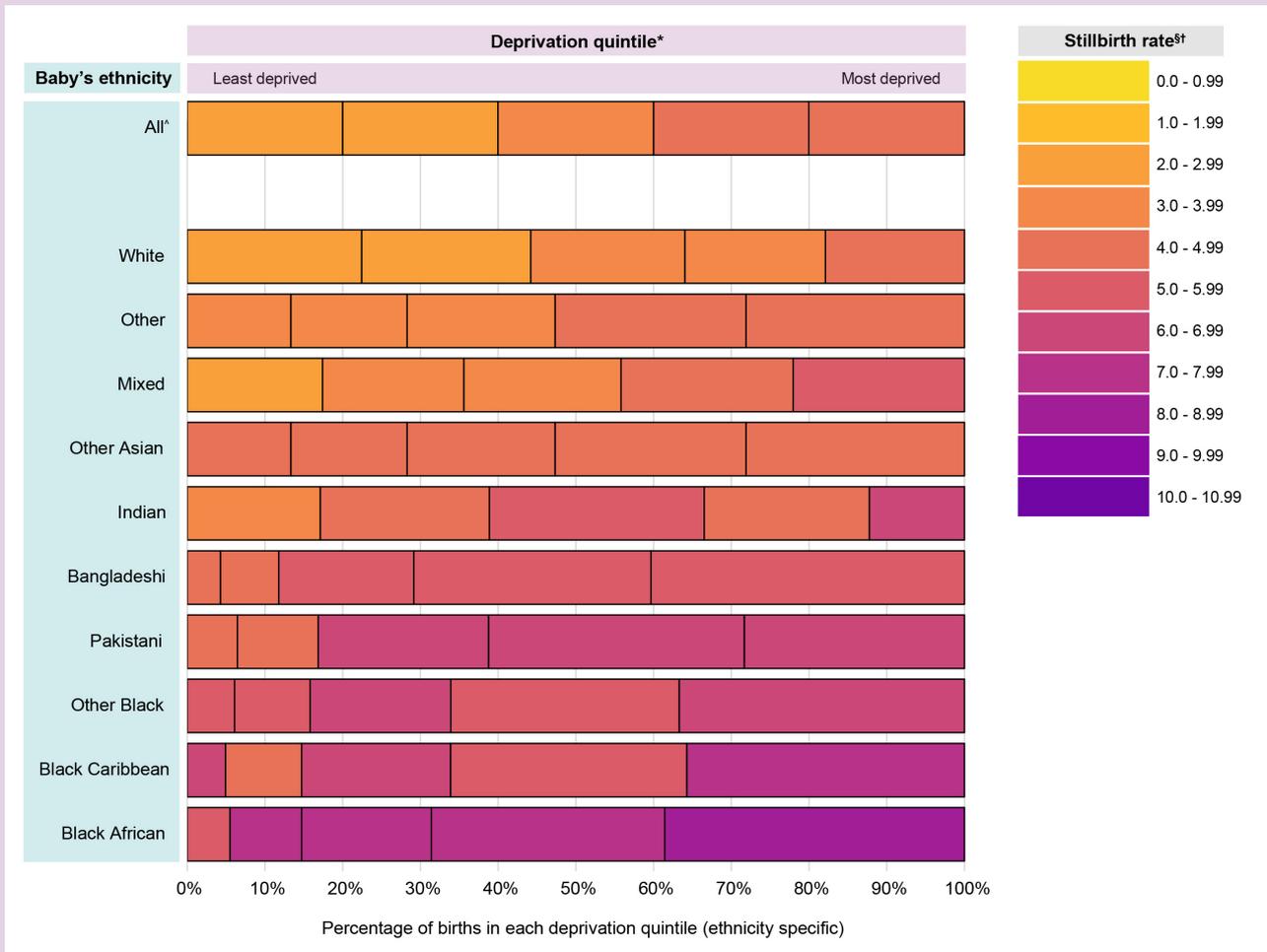
Numbers and rates of stillbirth and neonatal death for births in the UK at 24⁺⁰ weeks' gestational age or later (excluding terminations of pregnancy) for the period 2016 to 2020, by babies' ethnicity and mothers' socio-economic deprivation quintile of residence.

Socio-economic deprivation is measured using the Children in Low-Income Families Local Measure [17] based on the mother's postcode of residence at the time of birth.

Results

1. Figures 4 & 5 and Tables 10 & 11 show the continued impact of deprivation in relation to stillbirth and neonatal mortality rates in the UK. Data for 2016 to 2020 showed an increase in mortality with increasing deprivation, with stillbirth rates ranging from 2.67 per 1,000 total births in the least deprived quintile to 4.69 per 1,000 total births in the most deprived quintile; and neonatal mortality rates ranging from 1.21 per 1,000 live births in the least deprived quintile to 2.12 per 1,000 live births in the most deprived quintile.
2. Using data for 2016 to 2020 we have explored stillbirth rates and neonatal mortality rates by ethnicity using more detailed information than previous reports, which highlights wide disparities in stillbirth and neonatal mortality rates relating to ethnicity in the UK. Stillbirth rates were highest for babies of Black African (7.80 stillbirths per 1,000 total births), Black Caribbean (6.42 stillbirths per 1000 total births) and Pakistani ethnicity (6.21 stillbirths per 1,000 births) compared to 3.43 stillbirths per 1,000 total births for babies of White ethnicity. Neonatal mortality rates were highest for babies of Pakistani (3.45 neonatal deaths per 1,000 live births), Black African (2.67 neonatal deaths per 1,000 live births) and Bangladeshi ethnicity (2.62 neonatal deaths per 1,000 live births) compared to 1.63 neonatal deaths per 1,000 live births for babies of White ethnicity.
3. Figure 4 highlights the combined impact of deprivation on stillbirth rates for babies of different ethnicities with rates ranging from 2.78 to 8.10 per 1,000 total births. Rates of stillbirth for babies of Black Caribbean, Black African, Pakistani and Bangladeshi ethnicity were extremely high. Rates for these babies for every deprivation quintile, even the least deprived quintile, exceeded rates for babies of White ethnicity in the most deprived quintile. Rates of over 7 per 1,000 total births were seen for 4 out of 5 quintiles of deprivation for babies of Black African ethnicity, with rates of 8.10 for those from the most deprived quintile.
4. Figure 5 similarly highlights the combined impact of deprivation on neonatal mortality rates for babies of different ethnicities. Rates of neonatal mortality for babies of Pakistani and Black African ethnicity were consistently high across all deprivation groups, ranging between 2.03 and 4.14 neonatal deaths per 1,000 live births compared to a range of 1.26 to 2.14 neonatal deaths per 1000 live births for babies of White ethnicity.

Figure 4: Stillbirth rates by babies' ethnicity and mothers' socio-economic deprivation quintile of residence: United Kingdom and Crown Dependencies, for births in 2016 to 2020



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

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

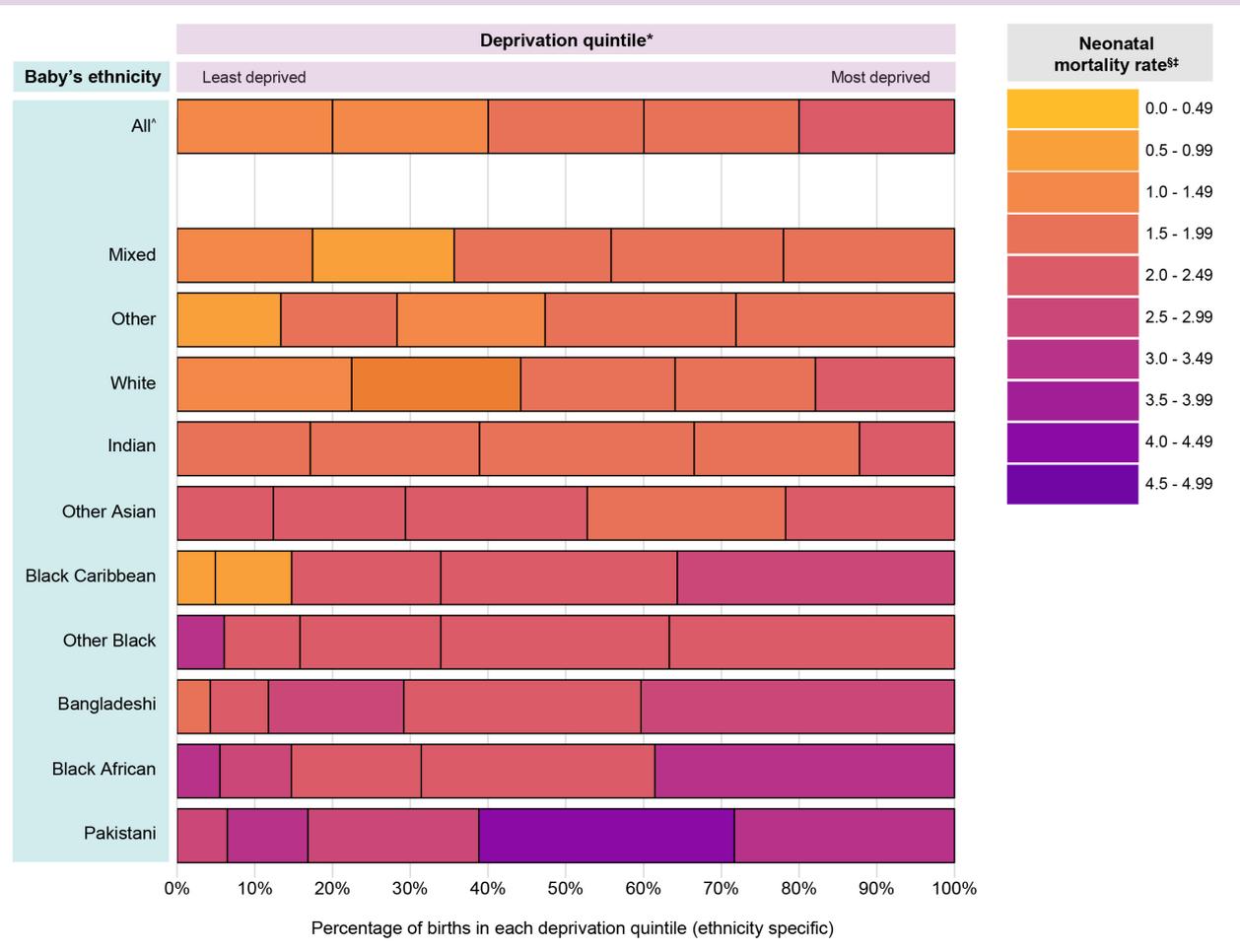
† per 1,000 total births

[^] including missing ethnicity

Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey

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Figure 5: Neonatal mortality rates by babies’ ethnicity and mothers’ socio-economic deprivation quintile of residence: United Kingdom and Crown Dependencies, for births in 2016 to 2020



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

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

‡ per 1,000 live births

[^] including missing ethnicity

Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey

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Table 10: Stillbirth rates by babies' ethnicity and mothers' socio-economic deprivation quintile of residence: United Kingdom and Crown Dependencies, for births in 2016 to 2020

Baby's ethnicity		Socioeconomic deprivation quintile					
		1-Least deprived	2	3	4	5 - Most deprived	All quintiles
White	Births [§]	573,833	555,885	508,045	461,729	457,540	2,557,032
	Stillbirths	1,596	1,633	1,679	1,771	2,093	8,772
	Rate [†]	2.78	2.94	3.30	3.84	4.57	3.43
Indian	Births [§]	17,937	22,765	28,959	22,272	12,804	104,737
	Stillbirths	60	107	156	110	78	511
	Rate [†]	3.35	4.70	5.39	4.94	6.09	4.88
Pakistani	Births [§]	9,002	14,488	30,652	45,920	39,527	139,589
	Stillbirths	43	70	188	314	252	867
	Rate [†]	4.78	4.83	6.13	6.84	6.38	6.21
Bangladeshi	Births [§]	2,061	3,629	8,403	14,772	19,508	48,373
	Stillbirths	10	16	49	80	116	271
	Rate [†]	4.85	4.41	5.83	5.42	5.95	5.60
Other Asian	Births [§]	8,288	11,357	15,651	17,070	14,535	66,901
	Stillbirths	36	46	75	85	61	303
	Rate [†]	4.34	4.05	4.79	4.98	4.20	4.53
Black Caribbean	Births [§]	1,278	2,551	4,993	7,909	9,298	26,029
	Stillbirths	8	11	30	44	74	167
	Rate [†]	6.26	4.31	6.01	5.56	7.96	6.42
Black African	Births [§]	6,067	10,112	18,406	33,077	42,450	110,112
	Stillbirths	35	79	144	257	344	859
	Rate [†]	5.77	7.81	7.82	7.77	8.10	7.80
Other Black	Births [§]	1,160	1,867	3,466	5,624	7,022	19,139
	Stillbirths	6	11	24	31	47	119
	Rate [†]	5.17	5.89	6.92	5.51	6.69	6.22
Mixed	Births [§]	34,942	36,594	40,565	44,508	44,289	200,898
	Stillbirths	102	117	162	206	235	822
	Rate [†]	2.92	3.20	3.99	4.63	5.31	4.09
Other	Births [§]	12,863	14,409	18,385	23,679	27,097	96,433
	Stillbirths	48	49	70	98	109	374
	Rate [†]	3.73	3.40	3.81	4.14	4.02	3.88
All ethnicities [^]	Births [§]	732,683	733,298	734,069	732,664	734,181	
	Stillbirths	1,956	2,144	2,581	3,009	3,442	
	Rate [†]	2.67	2.92	3.52	4.11	4.69	

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

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

[†] per 1,000 total births

[^] including missing ethnicity (N=297,652)

Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey

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Table 11: Neonatal mortality rates by babies' ethnicity and mothers' socio-economic deprivation quintile of residence: United Kingdom and Crown Dependencies, for births in 2016 to 2020

Baby's ethnicity		Socioeconomic deprivation quintile					
		1-Least deprived	2	3	4	5 - Most deprived	All quintiles
White	Live births [§]	572,237	554,252	506,366	459,958	455,447	2,548,260
	Neonatal deaths	720	806	798	855	973	4,152
	Rate [‡]	1.26	1.45	1.58	1.86	2.14	1.63
Indian	Live births [§]	17,877	22,658	28,803	22,162	12,726	104,226
	Neonatal deaths	28	37	45	41	30	181
	Rate [‡]	1.57	1.63	1.56	1.85	2.36	1.74
Pakistani	Live births [§]	8,959	14,418	30,464	45,606	39,275	138,722
	Neonatal deaths	23	44	90	189	132	478
	Rate [‡]	2.57	3.05	2.95	4.14	3.36	3.45
Bangladeshi	Live births [§]	2,051	3,613	8,354	14,692	19,392	48,102
	Neonatal deaths	4	9	23	34	56	126
	Rate [‡]	1.95	2.49	2.75	2.31	2.89	2.62
Other Asian	Live births [§]	8,252	11,311	15,576	16,985	14,474	66,598
	Neonatal deaths	17	23	38	30	35	143
	Rate [‡]	2.06	2.03	2.44	1.77	2.42	2.15
Black Caribbean	Live births [§]	1,270	2,540	4,963	7,865	9,224	25,862
	Neonatal deaths	1	2	10	18	26	57
	Rate [‡]	0.79	0.79	2.01	2.29	2.82	2.20
Black African	Live births [§]	6,032	10,033	18,262	32,820	42,106	109,253
	Neonatal deaths	20	27	37	78	130	292
	Rate [‡]	3.32	2.69	2.03	2.38	3.09	2.67
Other Black	Live births [§]	1,154	1,856	3,442	5,593	6,975	19,020
	Neonatal deaths	4	4	8	13	15	44
	Rate [‡]	3.47	2.16	2.32	2.32	2.15	2.31
Mixed	Live births [§]	34,840	36,477	40,403	44,302	44,054	200,076
	Neonatal deaths	42	35	65	78	88	308
	Rate [‡]	1.21	0.96	1.61	1.76	2.00	1.54
Other	Live births [§]	12,815	14,360	18,315	23,581	26,988	96,059
	Neonatal deaths	12	24	24	47	43	150
	Rate [‡]	0.94	1.67	1.31	1.99	1.59	1.56
All ethnicities [^]	Live births [§]	730,727	731,154	731,488	729,655	730,739	
	Neonatal deaths	881	1,021	1,147	1,397	1,549	
	Rate [‡]	1.21	1.40	1.57	1.91	2.12	

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

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

[‡] per 1,000 live births

[^] including missing ethnicity (N=297,585)

Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey

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Implications

This analysis of the impact of both deprivation and ethnicity provides additional information for public health specialists, commissioners and service providers to support and develop initiatives targeted at those groups at the highest risk of having a baby stillborn or who dies within the neonatal period.

A considerably higher proportion of babies of Black African, Black Caribbean, Pakistani and Bangladeshi ethnicity are born to mothers living in more deprived areas, which means they are disproportionately experiencing the higher rates observed with increasing deprivation compared to babies of White ethnicity born to mothers who were more likely to be living in less deprived areas. Only 5-6% of babies of Black African, Black Caribbean, Pakistani and Bangladeshi ethnicity were born to mothers living in the least deprived quintile compared to 22% of babies of White ethnicity. Conversely, 36-40% of babies of Black African, Black Caribbean and Bangladeshi ethnicity and 28% of babies of Pakistani ethnicity were born to mothers living in the most deprived quintile compared to 18% of babies of White ethnicity.

These data, highlighting issues of multiple disadvantage, confirm the need for national strategies to tackle disparities in maternity care experienced by women and people from ethnic minority groups and those living in deprived areas [14, 18, 19].

Recent work by MBRRACE-UK has investigated inequalities in stillbirths rates by ethnicity, including an exploration of cause of death [20]. The current MBRRACE-UK perinatal confidential enquiry, which will report in 2023, has been expanded to include mothers of both Black and Asian ethnicity. The enquiry is reviewing the quality of care provision to identify areas where care could be improved and to assess whether the care provided for these communities is equitable. The findings of this work will further support the national aims to improve maternity care for these high risk groups.

Recommendation 3

Develop UK-wide harmonised indicators to identify high risk groups, including ethnicity and deprivation measures, to facilitate direct population comparisons.

Recommendation 4

Improve the availability and accessibility of initiatives and policies to reduce stillbirth and neonatal mortality across the UK for health professionals, policy makers, academics, health service researchers and the public. Provide regular updates on progress towards publicised ambitions and targets.

Recommendations from previous reports requiring improved implementation

Ensure that there is a multi-agency targeted approach affecting people living in areas of high socio-economic deprivation across all points of the reproductive, pregnancy and neonatal healthcare pathway.

Identify the specific needs of Black and Asian populations and ensure that these are addressed as part of their reproductive and pregnancy healthcare provision.

MBRRACE-UK 2020 [13]

Initiate a research programme to inform the development of effective interventions to address health inequalities and reduce stillbirth and neonatal mortality rates.

Develop focused initiatives to reduce stillbirths and neonatal deaths among those at the highest risk, informed by the multidimensional effects of ethnicity, deprivation and age.

MBRRACE-UK 2021 [11]

Effect of twin pregnancy on perinatal mortality

Key findings

1. There has been a 12% reduction in the number of both singleton and twin births over the period 2016 to 2020.
2. There has been an increase in both stillbirth and neonatal mortality rates for twins over the period 2016 to 2020; from 6.18 to 7.31 per 1,000 total births and from 5.34 to 6.18 per 1,000 live births, respectively.
3. The gap between singleton and twin stillbirth and neonatal mortality rates is widening; from 2.31 per 1,000 total births in 2016 to 4.07 per 1,000 total births in 2020 for stillbirths, and from 3.71 per 1,000 live births in 2016 to 4.81 per 1,000 live births in 2020 for neonatal deaths. In 2020 the risk of twin stillbirth was over 2.25 times higher than for singletons and the risk of twin neonatal death was almost 3.5 times higher than for singletons.
4. Compared to singletons, stillbirth and neonatal mortality rates for twins are significantly lower for all preterm births (<37 weeks gestation) and low birth weight babies (<3500g).

Data presented

1. **Rates of stillbirth and neonatal death for births in the UK at 24⁺⁰ weeks' gestational age or later (excluding terminations of pregnancy) for the period 2016 to 2020, by multiplicity.**
2. **Mortality rate differences for stillbirths and neonatal deaths for births in the UK at 24⁺⁰ weeks' gestational age or later (excluding terminations of pregnancy) for the period 2016 to 2020, by multiplicity.**
3. **Rates of stillbirth and neonatal death for births in the UK at 24⁺⁰ weeks' gestational age or later (excluding terminations of pregnancy) for the period 2018 to 2020, by multiplicity and mothers' and babies' characteristics.**

Results

1. Numbers of births and stillbirths are provided for singleton and twin pregnancies for 2016 to 2020 (Table 12). Over this period there has been a 12% reduction in the number of both singleton and twin births across the UK.
2. Whilst numbers of stillbirths and neonatal deaths from twin pregnancies has remained fairly constant over time, rates of stillbirths and neonatal death from twin pregnancies has increased from 6.18 to 7.31 per 1,000 total births for stillbirths (Table 14) and from 5.32 to 6.20 per 1,000 live births for neonatal deaths over the period 2016 to 2020 (Tables 14 and 15).
3. Over the period 2016 to 2020 singleton stillbirth rates have reduced from 3.87 to 3.23 per 1,000 total births (Table 14) and neonatal mortality rates have reduced from 1.61 to 1.40 per 1,000 live births (Table 15).
4. There is wide variation in the stillbirth and neonatal mortality rates for twin births across the devolved nations. In 2020 twin stillbirth rates ranged from 5.13 in Scotland to 12.72 in Northern Ireland, and twin neonatal mortality rates ranged from 1.38 in Wales to 17.71 in Northern Ireland.
5. There has been a widening of the gap between singleton and twin stillbirth rates over the period 2016 to 2020 from 2.31 to 4.07 per 1,000 total births, with the risk of twin stillbirth being over 2.25 times higher than for singletons (Table 14).
6. A similar widening gap can be seen for singleton and twin neonatal mortality rates over this period; from 3.71 to 4.81 per 1,000 live births, with the risk of twin neonatal death being almost 3.5 times higher than for singletons (Table 15).
7. In terms of socio-demographic characteristics the largest difference in twin and singleton stillbirth and neonatal mortality rates is for the youngest mothers (aged <25 years), with twin stillbirth rates as high as 9.80 per 1,000 total births (Table 16) and twin neonatal mortality rates as high as 11.14 for mothers aged <20 years (Table 17). As for singletons, there are increasing stillbirth and neonatal death rates with increasing levels of deprivation, with a twin stillbirth rate of 9.25 per 1,000 total births for the fourth quintile of deprivation and a twin neonatal mortality rate of 7.89 per 1,000 live births for most deprived quintile of mothers.
8. The largest difference in twin and singleton stillbirth rates by ethnicity is in the Mixed ethnicity group, with a twin stillbirth rate of 10.92 per 1,000 total births compared to 3.75 per 1,000 total births for singletons. The smallest difference is in Black and Black British babies where the rates of stillbirth are similar for both twin and singleton births (8.09 and 6.88 per 1,000 total births respectively) (Table 16).

9. Rates of stillbirth and neonatal mortality for twins are significantly lower for all preterm births and low birth weight babies compared to singleton births e.g. for very preterm births from 28⁺⁰-31⁺⁶ weeks' gestational age the difference in the stillbirth rate between twins and singletons was -62.53 per 1,000 total births (Table 16) and the difference in the neonatal mortality rate was -14.78 (Table 17). For twins born at term rates for both stillbirths and neonatal deaths were higher than for term singletons.

Table 12: Number of births and stillbirths in singleton and twin pregnancies: United Kingdom*, for births in 2016 to 2020

Region		Number [§]				
		2016	2017	2018	2019	2020
England	Singleton births	643,362	627,471	607,091	592,510	569,202
	Singleton deaths	2,476	2,254	2,095	1,916	1,811
	Twin births	20,289	19,978	18,725	18,130	16,443
	Twin deaths	128	138	112	123	121
Scotland	Singleton births	51,963	50,585	48,942	47,212	44,908
	Singleton deaths	195	198	156	146	171
	Twin births	1,530	1,463	1,436	1,405	1,364
	Twin deaths	7	9	11	15	7
Wales	Singleton births	31,124	30,572	29,776	28,391	26,969
	Singleton deaths	137	111	108	107	91
	Twin births	947	778	897	810	728
	Twin deaths	8	6	5	3	4
Northern Ireland	Singleton births	23,573	22,783	22,234	21,962	20,990
	Singleton deaths	94	97	71	72	66
	Twin births	699	647	765	639	629
	Twin deaths	2	11	8	3	8
UK	Singleton births	750,022	731,411	708,043	690,075	662,069
	Singleton deaths	2,902	2,660	2,430	2,241	2,139
	Twin births	23,465	22,866	21,823	20,984	19,164
	Twin deaths	145	164	136	144	140

* Numbers for the Crown Dependencies have been suppressed due to small numbers

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

Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey

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Table 13: Number of births and neonatal deaths in singleton and twin pregnancies: United Kingdom*, for births in 2016 to 2020

Region		Number [§]				
		2016	2017	2018	2019	2020
England	Singleton births	640,886	625,217	604,996	590,594	567,391
	Singleton deaths	1,036	965	903	843	787
	Twin births	20,161	19,840	18,613	18,007	16,322
	Twin deaths	110	113	120	110	96
Scotland	Singleton births	51,768	50,387	48,786	47,066	44,737
	Singleton deaths	79	70	61	65	59
	Twin births	1,523	1,454	1,425	1,390	1,357
	Twin deaths	12	10	9	8	10
Wales	Singleton births	30,987	30,461	29,668	28,284	26,878
	Singleton deaths	31	47	49	56	35
	Twin births	939	772	892	807	724
	Twin deaths	1	3	7	6	1
Northern Ireland [°]	Singleton births	23,479	22,686	22,163	21,890	20,924
	Singleton deaths	54	47	40	59	40
	Twin births	697	636	757	636	621
	Twin deaths	1	1	6	4	11
UK	Singleton births	747,120	728,751	705,613	687,834	659,930
	Singleton deaths	1,200	1,129	1,053	1,023	921
	Twin births	23,320	22,702	21,687	20,840	19,024
	Twin deaths	124	127	142	128	118

* Numbers for the Crown Dependencies have been suppressed due to small numbers

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

[°] New legislation on termination of pregnancy in Northern Ireland (Abortion (Northern Ireland) Regulations 2020) became law on 31st March 2020

Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey

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Table 14: Stillbirth rates in singleton and twin pregnancies: United Kingdom*, for births in 2016 to 2020

Region		Stillbirth rate ^{§†}				
		2016	2017	2018	2019	2020
England	Singleton	3.85	3.59	3.45	3.23	3.18
	Twin	6.31	6.91	5.98	6.78	7.36
	Difference in rate	2.46	3.32	2.53	3.55	4.18
	(95% CI)	(1.33 to 3.59)	(2.13 to 4.50)	(1.39 to 3.67)	(2.32 to 4.78)	(2.83 to 5.52)
Scotland	Singleton	3.75	3.91	3.19	3.09	3.81
	Twin	4.58	6.15	7.66	10.68	5.13
	Difference in rate	0.82	2.24	4.47	7.58	1.32
	(95% CI)	(-2.94 to 4.58)	(-2.16 to 6.63)	(-0.42 to 9.37)	(1.82 to 13.35)	(-2.89 to 5.54)
Wales	Singleton	4.40	3.63	3.63	3.77	3.37
	Twin	8.45	7.71	5.57	3.70	5.49
	Difference in rate	4.05	4.08	1.95	-0.07	2.12
	(95% CI)	(-2.37 to 10.47)	(-2.76 to 10.92)	(-3.55 to 7.44)	(-4.94 to 4.81)	(-4.00 to 8.24)
Northern Ireland [°]	Singleton	3.99	4.26	3.19	3.28	3.14
	Twin	2.86	17.00	10.46	4.69	12.72
	Difference in rate	-1.13	12.74	7.26	1.42	9.57
	(95% CI)	(-5.90 to 3.65)	(1.95 to 23.54)	(-0.66 to 15.19)	(-4.74 to 7.58)	(-0.03 to 19.18)
UK	Singleton	3.87	3.64	3.43	3.25	3.23
	Twin	6.18	7.17	6.23	6.86	7.31
	Difference in rate	2.31	3.54	2.80	3.61	4.07
	(95% CI)	(1.28 to 3.34)	(2.41 to 4.66)	(1.72 to 3.88)	(2.47 to 4.76)	(2.83 to 5.31)

* Rates for the Crown Dependencies have been suppressed due to small numbers

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

[†] per 1,000 total births

[°] New legislation on termination of pregnancy in Northern Ireland (Abortion (Northern Ireland) Regulations 2020) became law on 31st March 2020

Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey

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Table 15: Neonatal mortality rates in singleton and twin pregnancies: United Kingdom*, for births in 2016 to 2020

Region		Neonatal mortality rate ^{§†}				
		2016	2017	2018	2019	2020
England	Singleton	1.62	1.54	1.49	1.43	1.39
	Twin	5.46	5.70	6.45	6.11	5.88
	Difference in rate	3.84	4.15	4.95	4.68	4.49
	(95% CI)	(2.79 to 4.89)	(3.07 to 5.23)	(3.77 to 6.14)	(3.51 to 5.85)	(3.29 to 5.70)
Scotland	Singleton	1.53	1.39	1.25	1.38	1.32
	Twin	7.88	6.88	6.32	5.76	7.37
	Difference in rate	6.35	5.49	5.07	4.37	6.05
	(95% CI)	(1.56 to 11.14)	(0.87 to 10.10)	(0.58 to 9.55)	(0.01 to 8.74)	(1.11 to 10.99)
Wales	Singleton	1.00	1.54	1.65	1.98	1.30
	Twin	1.06	3.89	7.85	7.43	1.38
	Difference in rate	0.06	2.34	6.20	5.46	0.08
	(95% CI)	(-2.60 to 2.73)	(-2.73 to 7.42)	(-0.19 to 12.58)	(-1.13 to 12.04)	(-3.37 to 3.53)
Northern Ireland	Singleton	2.30	2.07	1.80	2.70	1.91
	Twin	1.43	1.57	7.93	6.29	17.71
	Difference in rate	-0.87	-0.50	6.12	3.59	15.80
	(95% CI)	(-4.48 to 2.75)	(-4.44 to 3.44)	(-0.90 to 13.15)	(-3.40 to 10.59)	(4.58 to 27.02)
UK	Singleton	1.61	1.55	1.49	1.49	1.40
	Twin	5.32	5.59	6.55	6.14	6.20
	Difference in rate	3.71	4.04	5.06	4.65	4.81
	(95% CI)	(2.75 to 4.67)	(3.05 to 5.04)	(3.95 to 6.16)	(3.57 to 5.74)	(3.66 to 5.95)

* Rates for the Crown Dependencies have been suppressed due to small numbers

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

† per 1,000 live births

° New legislation on termination of pregnancy in Northern Ireland (Abortion (Northern Ireland) Regulations 2020) became law on 31st March 2020

Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey

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Table 16: Stillbirth rates in singleton and twin pregnancies by mother's and baby's characteristics: United Kingdom and Crown Dependencies, for births in 2018 to 2020

Characteristic	Singleton			Twin			Stillbirth rate [†]			
	Births [§]	Stillbirths [§]		Births [§]	Stillbirths [§]		Singleton	Twin	Difference in rate	(95% CI)
N		%	N		%					
Maternal age										
<20	56,770	252	(3.7)	816	8	(1.9)	4.44	9.80	5.36	(-2.04 to 12.77)
20-24	273,976	1,099	(16.1)	5,427	45	(10.7)	4.01	8.29	4.28	(1.76 to 6.80)
25-29	548,179	1,695	(24.9)	14,202	90	(21.4)	3.09	6.34	3.25	(1.90 to 4.59)
30-34	657,432	2,032	(29.8)	20,655	135	(32.1)	3.09	6.54	3.45	(2.31 to 4.58)
35-39	376,237	1,336	(19.6)	14,826	106	(25.2)	3.55	7.15	3.60	(2.19 to 5.00)
≥40	88,167	405	(5.9)	4,858	37	(8.8)	4.59	7.62	3.02	(0.43 to 5.62)
Not known	72,192	1	(0.0)	2,410	0	(0.0)				
Deprivation										
1 - Least deprived	413,206	1,001	(14.7)	13,250	71	(16.9)	2.42	5.36	2.94	(1.64 to 4.23)
2	411,582	1,046	(15.3)	12,811	77	(18.3)	2.54	6.01	3.47	(2.08 to 4.86)
3	415,194	1,348	(19.8)	12,152	74	(17.6)	3.25	6.09	2.84	(1.41 to 4.28)
4	412,787	1,560	(22.9)	11,890	110	(26.1)	3.78	9.25	5.47	(3.70 to 7.25)
5 - Most deprived	414,294	1,852	(27.2)	11,874	87	(20.7)	4.47	7.33	2.86	(1.27 to 4.45)
Not known	5,890	13	(0.2)	1,217	2	(0.5)				
Baby's sex										
Male	1,062,695	3,433	(50.3)	31,564	190	(45.1)	3.23	6.02	2.79	(1.91 to 3.67)
Female	1,010,066	3,309	(48.5)	31,564	211	(50.1)	3.28	6.68	3.41	(2.49 to 4.33)
Not known	192	78	(1.1)	66	20	(4.8)				
Baby's ethnicity										
White	1,434,988	4,520	(66.3)	43,076	296	(70.3)	3.15	6.87	3.72	(2.92 to 4.52)
Mixed	116,389	437	(6.4)	3,387	37	(8.8)	3.75	10.92	7.17	(3.50 to 10.84)
Asian, Asian British	206,512	1,036	(15.2)	5,176	44	(10.5)	5.02	8.50	3.48	(0.87 to 6.10)
Black, Black British	86,501	595	(8.7)	3,462	28	(6.7)	6.88	8.09	1.21	(-1.97 to 4.39)
Other	54,204	203	(3.0)	1,424	12	(2.9)	3.75	8.43	4.68	(-0.45 to 9.82)
Refused/Not Known	174,359	29	(0.4)	6,669	4	(1.0)	0.17	0.60	0.43	(-0.24 to 1.10)
Gestational age at birth (weeks)										
24 ⁺⁰ -27 ⁺⁶	6,946	1,669	(24.5)	1,555	106	(25.2)	240.28	68.17	-172.11	(-188.57 to -155.66)
28 ⁺⁰ -31 ⁺⁶	13,028	1,158	(17.0)	3,946	104	(24.7)	88.89	26.36	-62.53	(-69.68 to -55.37)
32 ⁺⁰ -36 ⁺⁶	105,134	1,771	(26.0)	30,739	160	(38.0)	16.85	5.21	-11.64	(-12.78 to -10.50)
37 ⁺⁰ -41 ⁺⁶	1,829,674	2,178	(31.9)	24,325	51	(12.1)	1.19	2.10	0.91	(0.31 to 1.50)
≥42 ⁺⁰	39,753	36	(0.5)	18	0	(0.0)	0.91	0.00	-0.91	(-28.99 to 27.18)
Not known	78,418	8	(0.1)	2,611	0	(0.0)				
Birthweight (g)										
<1,500	16,496	2,844	(41.7)	4,842	312	(74.1)	172.41	64.44	-107.97	(-117.11 to -98.83)
1,500-2,499	98,804	1,635	(24.0)	28,157	71	(16.9)	16.55	2.52	-14.03	(-15.04 to -13.02)
2,500-3,499	1,078,449	1,743	(25.6)	25,284	12	(2.9)	1.62	0.47	-1.14	(-1.44 to -0.84)
3,500-4,499	815,225	547	(8.0)	920	1	(0.2)	0.67	1.09	0.42	(-2.26 to 3.09)
≥4,500	27,714	40	(0.6)	25	0	(0.0)	1.44	0.00	-1.44	(-21.91 to 19.02)
Not known	36,265	11	(0.2)	3,966	25	(5.9)				

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

[†] per 1,000 total births

Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey

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Table 17: Neonatal mortality rates in singleton and twin pregnancies by mother's and baby's characteristics: United Kingdom and Crown Dependencies, for births in 2018 to 2020

Characteristic	Singleton				Twin			Neonatal mortality rate [‡]			
	Births [§]	Neonatal deaths [§]		Births [§]	Neonatal deaths [§]		Singleton	Twin	Difference in rate	(95% CI)	
		N	%		N	%					
Maternal age											
<20	56,518	125	(4.2)	808	9	(2.3)	2.21	11.14	8.93	(1.05 to 16.80)	
20-24	272,877	484	(16.1)	5,382	48	(12.4)	1.77	8.92	7.14	(4.53 to 9.76)	
25-29	546,484	795	(26.5)	14,112	104	(26.8)	1.45	7.37	5.91	(4.46 to 7.37)	
30-34	655,400	879	(29.3)	20,520	121	(31.2)	1.34	5.90	4.56	(3.48 to 5.63)	
35-39	374,901	541	(18.0)	14,720	74	(19.1)	1.44	5.03	3.58	(2.40 to 4.77)	
≥40	87,762	179	(6.0)	4,821	32	(8.3)	2.04	6.64	4.60	(2.18 to 7.02)	
Not known	72,191	0	(0.0)	2,410	0	(0.0)					
Deprivation											
1 - Least deprived	412,205	422	(14.1)	13,179	71	(18.3)	1.02	5.39	4.36	(3.07 to 5.66)	
2	410,536	499	(16.6)	12,734	75	(19.3)	1.22	5.89	4.67	(3.30 to 6.05)	
3	413,846	595	(19.8)	12,078	63	(16.2)	1.44	5.22	3.78	(2.45 to 5.11)	
4	411,227	692	(23.0)	11,780	86	(22.2)	1.68	7.30	5.62	(4.03 to 7.20)	
5 - Most deprived	412,442	788	(26.2)	11,787	93	(24.0)	1.91	7.89	5.98	(4.33 to 7.63)	
Not known	5,877	7	(0.2)	1,215	0	(0.0)					
Baby's sex											
Male	1,059,262	1,636	(54.5)	31,374	222	(57.2)	1.54	7.08	5.53	(4.58 to 6.48)	
Female	1,006,757	1,352	(45.0)	31,353	162	(41.8)	1.34	5.17	3.82	(3.01 to 4.64)	
Not known	114	15	(0.5)	46	4	(1.0)					
Baby's ethnicity											
White	1,430,468	2,051	(68.3)	42,780	287	(74.0)	1.43	6.71	5.27	(4.49 to 6.06)	
Mixed	115,952	165	(5.5)	3,350	19	(4.9)	1.42	5.67	4.25	(1.54 to 6.95)	
Asian, Asian British	205,476	476	(15.9)	5,132	34	(8.8)	2.32	6.63	4.31	(1.98 to 6.64)	
Black, Black British	85,906	189	(6.3)	3,434	28	(7.2)	2.20	8.15	5.95	(2.78 to 9.13)	
Other	54,001	76	(2.5)	1,412	14	(3.6)	1.41	9.92	8.51	(2.97 to 14.05)	
Refused/Not Known	174,330	46	(1.5)	6,665	6	(1.6)	0.26	0.90	0.64	(-0.17 to 1.44)	
Gestational age at birth (weeks)											
24 ⁺⁰ -27 ⁺⁶	5,277	763	(25.4)	1,449	201	(51.8)	144.59	138.72	-5.87	(-26.48 to 14.74)	
28 ⁺⁰ -31 ⁺⁶	11,870	401	(13.4)	3,842	73	(18.8)	33.78	19.00	-14.78	(-20.36 to -9.21)	
32 ⁺⁰ -36 ⁺⁶	103,363	618	(20.6)	30,579	85	(21.9)	5.98	2.78	-3.20	(-3.97 to -2.42)	
37 ⁺⁰ -41 ⁺⁶	1,827,496	1,187	(39.5)	24,274	29	(7.5)	0.65	1.19	0.55	(0.09 to 1.00)	
≥42 ⁺⁰	39,717	28	(0.9)	18	0	(0.0)	0.70	0.00	-0.70	(-28.76 to 27.35)	
Not known	78,410	6	(0.2)	2,611	0	(0.0)					
Birthweight (g)											
<1,500	13,652	1,116	(37.2)	4,530	282	(72.7)	81.75	62.25	-19.49	(-28.05 to -10.94)	
1,500-2,499	97,169	685	(22.8)	28,086	83	(21.4)	7.05	2.96	-4.09	(-4.94 to -3.25)	
2,500-3,499	1,076,706	874	(29.1)	25,272	22	(5.7)	0.81	0.87	0.06	(-0.33 to 0.45)	
3,500-4,499	814,678	295	(9.8)	919	0	(0.0)	0.36	0.00	-0.36	(-0.95 to 0.22)	
≥4,500	27,674	23	(0.8)	25	0	(0.0)	0.83	0.00	-0.83	(-21.19 to 19.53)	
Not known	36,254	10	(0.3)	3,941	1	(0.3)					

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

[‡] per 1,000 live births

Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey

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Implications

The reduction in births across the UK is reflected equally in both singleton and twin pregnancies with a 12% reduction for both groups. However, despite this reduction in births the number of stillbirths and neonatal deaths from twin pregnancies has remained stable resulting in rates of both stillbirths and neonatal deaths from twin pregnancies have increased over the past five years: an increase of 20% for stillbirths and 16% for neonatal deaths. This has led to a widening gap between singleton and twin stillbirth and neonatal mortality rates which could be partially due to a differential effect of the intervention programmes established to reduce mortality rates across the UK, with a lower impact on the prevention of stillbirths and neonatal deaths from twin pregnancies. Detailed investigation of the specific groups of twin stillbirths and neonatal deaths

where there are higher or lower differences than in overall rates may provide insight into new strategies to reduce mortality rates. These groups include the Black and Black British babies where (although numbers are small) the difference in stillbirth rates between singleton and twin pregnancies is the lowest across defined ethnic groups and significantly lower than the overall difference for all groups. The youngest mothers, aged less than 25 years, have the highest difference in both stillbirth and neonatal mortality rates providing a group for whom new initiative should be developed. The information provided here, alongside the key findings and recommendation from the recent MBRRACE-UK perinatal confidential enquiry into stillbirths and neonatal deaths in twin pregnancies [11] provide evidence to facilitate the development of such initiatives.

Analysis of the stillbirth and neonatal mortality rates for singleton and twin pregnancies has confirmed previous findings that survival for babies from twin pregnancies born before 37 weeks gestation is better than for their singleton counterparts. [21-23]

Recommendation 5

Investigate the characteristics of stillbirths and neonatal deaths in twin pregnancies, particularly with regard to gestation at delivery, in order to understand the reasons for increasing mortality rates.

Causes of perinatal death

Key findings

1. Although the proportion of stillbirths classified as of unknown cause has reduced over time, one-third of stillbirths still fall into this category (33% in 2020); a rate of 1.08 per 1,000 total births. An increasing proportion of stillbirths have been classified as due to placental causes over time; just over one-third in 2020 (35%). This represents a rate of 1.16 per 1,000 total births.
2. Around 40% of neonatal deaths are attributed to neonatal causes. The key driver for the reduction in mortality rates for these deaths (a fall from 0.75 to 0.64 per 1,000 live births from 2016 to 2020) is a fall in deaths classified as due to extreme prematurity, from 0.27 to 0.16 per 1,000 live births over the period.
3. Congenital anomalies continue to contribute significantly to mortality rates, comprising around one-third of neonatal deaths and just under one-tenth of stillbirths.

Data presented

1. **The number and proportion of stillbirth and neonatal death for births in the UK at 24⁺⁰ weeks' gestational age or later (excluding terminations of pregnancy) for the period 2016 to 2020, by cause of death .**
2. **Rates of stillbirth and neonatal death for births in the UK at 24⁺⁰ weeks' gestational age or later (excluding terminations of pregnancy) for the period 2016 to 2020, by cause of death.**
3. **The number and proportion of stillbirths and neonatal deaths where there was an offer of post-mortem and whether consent was obtained, in 2020.**
4. **The number and proportion of stillbirths and neonatal deaths where a placental histology examination was carried out, in 2020.**

Causes of death are reported to MBRRACE-UK using the Cause of Death & Associated Conditions (CODAC) classification system [24]. The CODAC system has a three level hierarchical tree for the coding of both the primary cause of death and any associated conditions. The CODAC level 1 and level 2 classification is presented for all stillbirths and neonatal deaths.

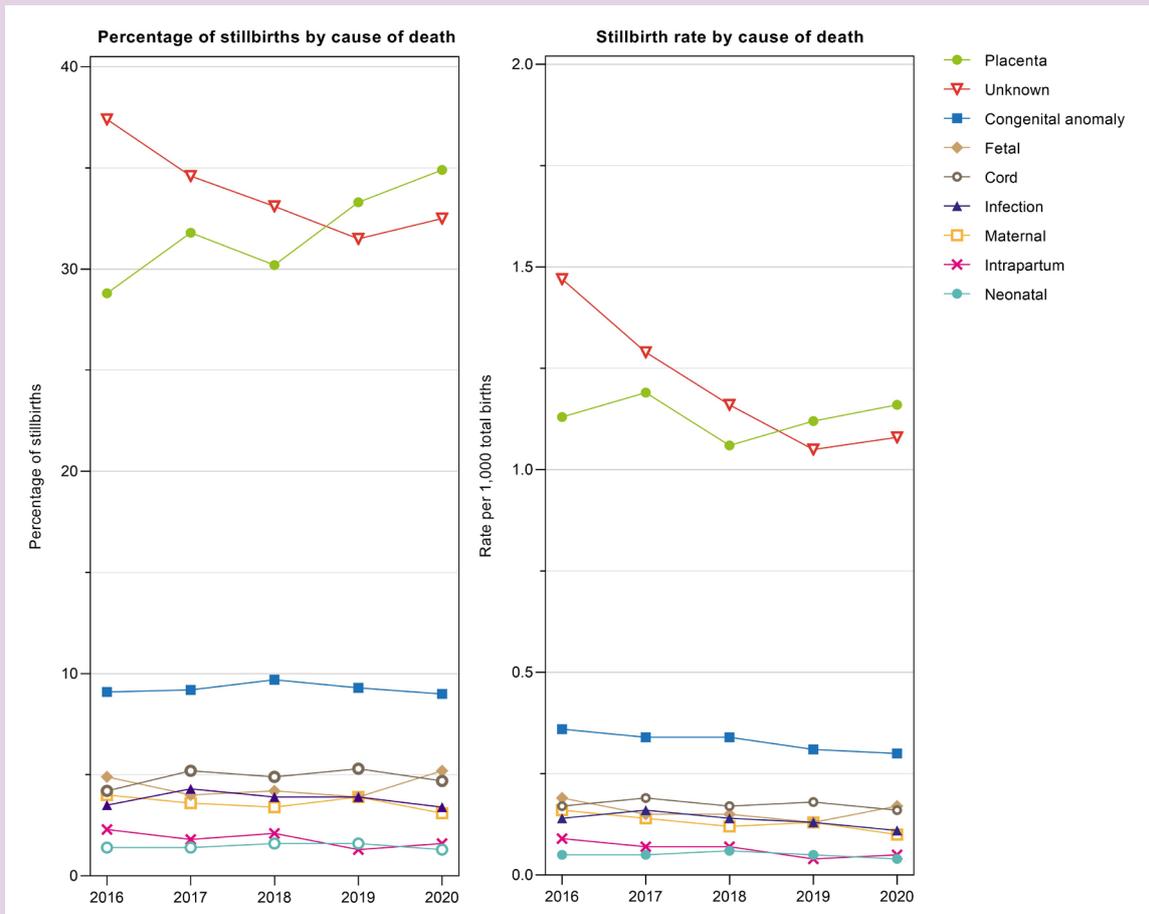
When reporting a death via the MBRRACE-UK data entry system reporters are asked to complete both a primary cause of death and up to two associated conditions. Following a detailed review of the coding of deaths reported as due to congenital anomalies in the 2015 MBRRACE-UK report, all cause of death data in this report is presented using congenital anomaly as the cause of death for all deaths where a congenital anomaly is coded as either the primary cause or an associated condition.

Results

1. The reported proportions and rates by CODAC level 1 cause of death for all stillbirths over the period 2016 to 2020 are presented in Table 18 and in Figure 6. Over this period, the proportion of stillbirths classified as unknown cause of death has fallen from 37.4% in 2016 to 32.5% in 2020. This is reflected in a reduction in the rate of stillbirth with unknown cause of death from 1.47 to 1.08 per 1,000 total births.
2. Stillbirths ascribed to a placental cause show the opposite, with an increasing proportion over time: 28.8% in 2016 to 34.9% in 2020, which is mirrored by an increasing rate: from 1.13 in 2016 to 1.16 in 2020.
3. The proportion of stillbirths due to congenital anomalies has remained fairly constant over the period: 9.0% in 2020, a rate of 0.30 per 1,000 total births.
4. Stillbirths due to intrapartum causes have shown a reduction in both the proportion and rates over the period: 2.3% to 1.6% and 0.09 to 0.05 per 1,000 total births, respectively.

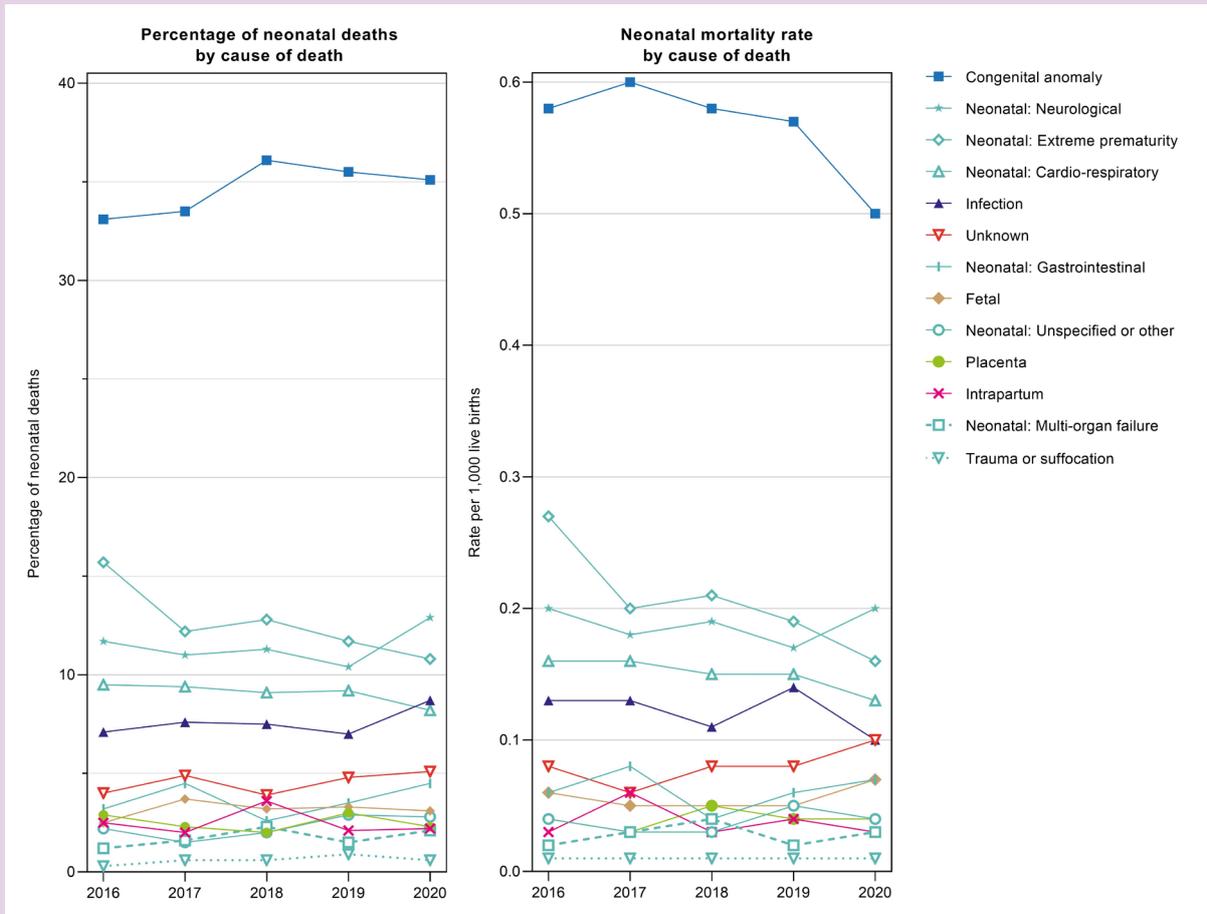
5. For neonatal deaths, the reported proportions and rates by CODAC level 1 and level 2 cause of death over the period 2016 to 2020 are presented in Table 19 and in Figure 7. In part due to how the CODAC system is structured, once deaths due to congenital anomalies are excluded most neonatal deaths are coded within the “Neonatal” category at level 1. Around two-fifths of neonatal deaths are attributed to neonatal causes (41.8% in 2020) with decreasing rates over the five year period: 0.75 to 0.64 per 1,000 live births. However the rate of reduction in neonatal mortality for this group has slowed since 2017.
6. Within the “Neonatal” category the majority of CODAC level 2 causes are subject to wider year-on-year variation due to the small number of deaths within most level 2 categories. However, the mortality rate for two of the three largest CODAC level 2 neonatal causes have both fallen over the 5 year period with a 40% fall for deaths from extreme prematurity from 0.27 to 0.16 per 1,000 live births and a 19% fall for deaths from cardio-respiratory causes from 0.16 to 0.13 per 1,000 live births.
7. Congenital anomalies continue to account for around one-third of neonatal deaths. In 2020, the neonatal mortality rate due to congenital anomalies was 0.50 per 1,000 live births, a small reduction after remaining fairly static over the preceding four years.
8. The rate and proportion of neonatal deaths attributed to intrapartum causes remains low at 2.2% and 0.03 per 1,000 live births in 2020. However within the CODAC classification system these deaths can be classified in two ways: as a CODAC level 1 “Intrapartum” cause or in the CODAC level 2 “Neonatal>Neurological” category which includes those deaths determined to be caused by Hypoxic Ischaemic Encephalopathy (HIE).
9. Contrary to the findings for stillbirths, the proportion and rate of neonatal deaths of unknown cause remain low at 6.5% and 0.10 per 1,000 live births in 2020.
10. Stillbirth and neonatal mortality rates are presented by CODAC level 2 cause of death for each CODAC level 1 category in Figures 8 and 9. This provides additional detail of the type of congenital anomaly (e.g. trisomy, CNS), the type of infection (e.g. Group B Streptococci, viral) etc. A breakdown of the deaths within in each category can be found in the accompanying Tables and Figures document.
11. Post-mortem examination (PM) was offered to parents for almost all stillbirths (98%) and most neonatal deaths (86%). Where a PM was offered consent was given for half of stillbirths (53%) and one-third of neonatal deaths (34%). Examination by the coroner or procurator fiscal accounted for an additional 3% of neonatal deaths.
12. Placental histology examination was conducted for almost all stillbirths (95%) and just over three-quarters (78%) of neonatal deaths on day 1 of life or where the cause of death was reported as intrapartum-related. This represents a small increase for stillbirths since 2019 (93%) but no change for neonatal deaths.

Figure 6: Stillbirths by CODAC level 1 cause of death: United Kingdom and Crown Dependencies, for births in 2016 to 2020



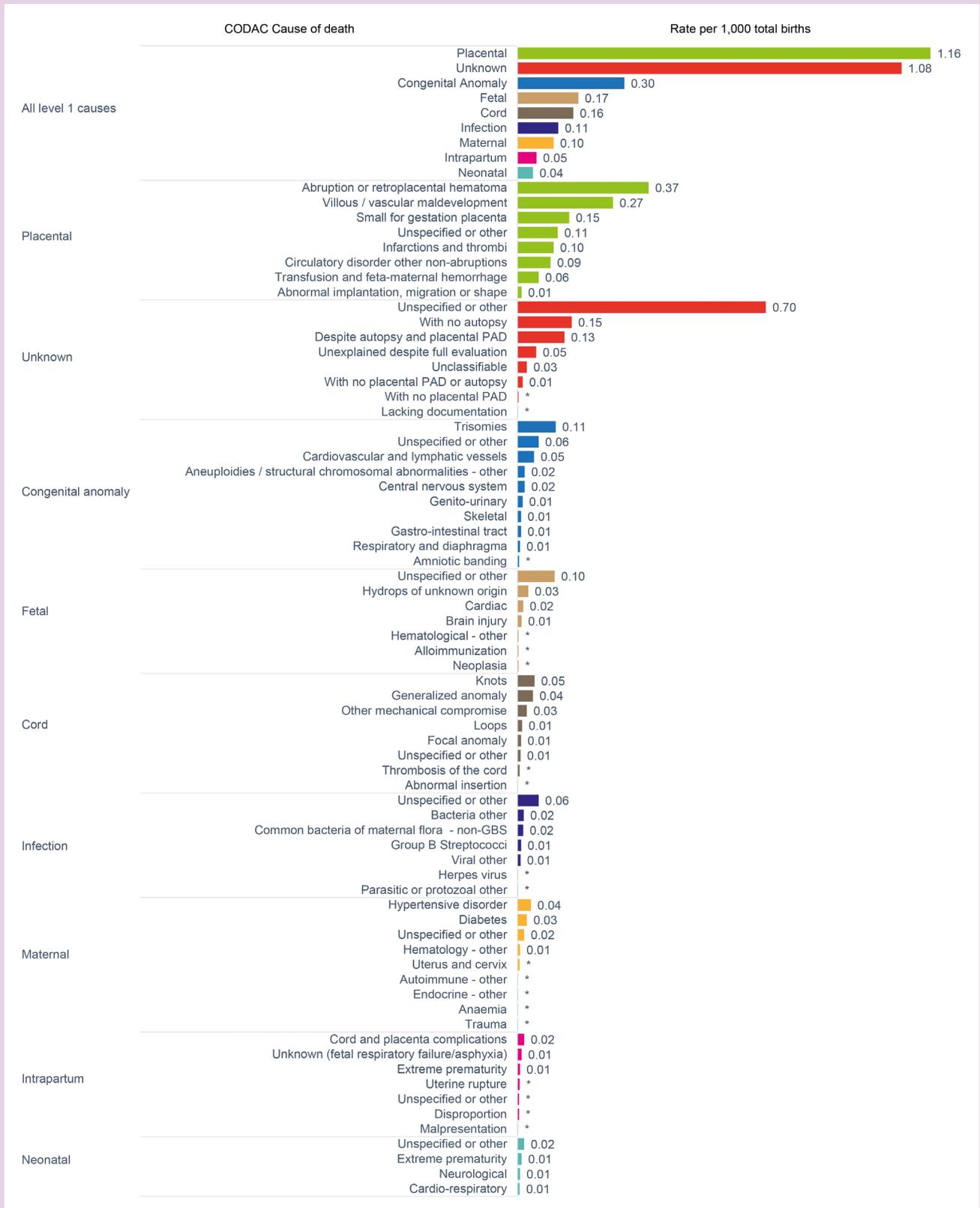
Excluding terminations of pregnancy and births <24⁺⁰ weeks' gestational age
 Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey
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Figure 7: Neonatal deaths by CODAC level 1 and CODAC level 2 “Neonatal” cause of death: United Kingdom and Crown Dependencies, for births in 2016 to 2020



Excluding terminations of pregnancy and births <24⁺⁰ weeks' gestational age
 Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey
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Figure 8: Stillbirth rates by CODAC level 2 cause of death: United Kingdom and Crown Dependencies, for births in 2020



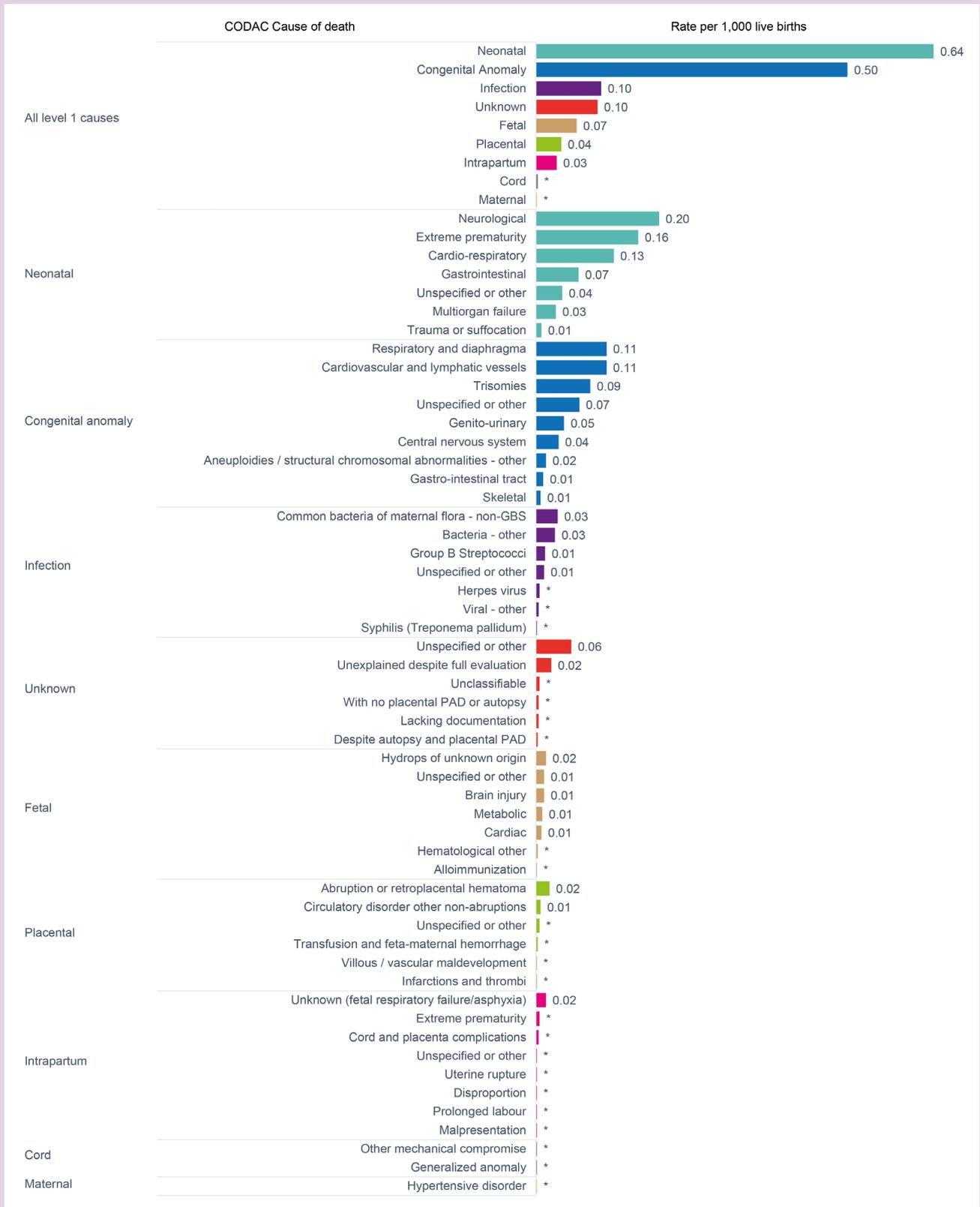
Excluding terminations of pregnancy and births <24⁺⁰ weeks' gestational age.

* Rate suppressed due to small numbers.

Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey.

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Figure 9: Neonatal mortality rates by CODAC level 2 cause of death: United Kingdom and Crown Dependencies, for births in 2020



Excluding terminations of pregnancy and births <24⁺⁰ weeks' gestational age.

* Rate suppressed due to small numbers.

Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey.

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Table 18: Stillbirth rates by CODAC level 1 cause of death: United Kingdom and Crown Dependencies, for births in 2016 to 2020

CODAC cause of death: level 1	Stillbirths N (%)				
	Rate [†]				
	2016	2017	2018	2019	2020
Infection	108 (3.5)	121 (4.3)	101 (3.9)	94 (3.9)	79 (3.4)
	0.14	0.16	0.14	0.13	0.11
Neonatal	42 (1.4)	41 (1.4)	42 (1.6)	39 (1.6)	30 (1.3)
	0.05	0.05	0.06	0.05	0.04
Intrapartum	71 (2.3)	51 (1.8)	53 (2.1)	30 (1.3)	37 (1.6)
	0.09	0.07	0.07	0.04	0.05
Congenital anomaly	280 (9.1)	262 (9.2)	249 (9.7)	223 (9.3)	207 (9.0)
	0.36	0.34	0.34	0.31	0.30
Fetal	149 (4.9)	113 (4.0)	109 (4.2)	93 (3.9)	118 (5.1)
	0.19	0.15	0.15	0.13	0.17
Cord	130 (4.2)	148 (5.2)	127 (4.9)	128 (5.3)	108 (4.7)
	0.17	0.19	0.17	0.18	0.16
Placenta	882 (28.8)	904 (31.8)	780 (30.2)	800 (33.3)	800 (34.9)
	1.13	1.19	1.06	1.12	1.16
Maternal	122 (4.0)	103 (3.6)	88 (3.4)	94 (3.9)	70 (3.1)
	0.16	0.14	0.12	0.13	0.10
Unknown	1145 (37.4)	982 (34.6)	853 (35.1)	756 (31.5)	745 (32.5)
	1.47	1.29	1.16	1.05	1.08
Missing	136 (4.4)	115 (4)	177 (6.9)	142 (5.9)	98 (4.3)
	0.17	0.15	0.24	0.2	0.14

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

[†] per 1,000 total births

Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey

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Table 19: Neonatal mortality rates by CODAC level 1 and level 2 cause of death: United Kingdom and Crown Dependencies, for births in 2016 to 2020

CODAC cause of death: level 1 and level 2 (neonatal)	Neonatal deaths N (%) [§]				
	Rate [‡]				
	2016	2017	2018	2019	2020
Infection	101 (7.6) 0.13	95 (7.5) 0.13	84 (7.0) 0.11	101 (8.7) 0.14	72 (6.9) 0.10
Neonatal	586 (43.8) 0.75	517 (40.8) 0.68	491 (41) 0.67	467 (40.3) 0.65	439 (41.8) 0.64
Extreme prematurity	210 (15.7) 0.27	155 (12.2) 0.20	154 (12.8) 0.21	136 (11.7) 0.19	113 (10.8) 0.16
Neurological	157 (11.7) 0.20	139 (11) 0.18	136 (11.3) 0.19	121 (10.4) 0.17	136 (12.9) 0.20
Cardio-respiratory	127 (9.5) 0.16	119 (9.4) 0.16	109 (9.1) 0.15	107 (9.2) 0.15	86 (8.2) 0.13
Gastrointestinal	43 (3.2) 0.06	57 (4.5) 0.08	31 (2.6) 0.04	41 (3.5) 0.06	47 (4.5) 0.07
Multi-organ failure	16 (1.2) 0.02	20 (1.6) 0.03	28 (2.3) 0.04	17 (1.5) 0.02	22 (2.1) 0.03
Trauma or suffocation	4 (0.3) 0.01	7 (0.6) 0.01	7 (0.6) 0.01	10 (0.9) 0.01	6 (0.6) 0.01
Inadequate care	0 (0.0) 0.00	1 (0.1) 0.00	2 (0.2) 0.00	1 (0.1) 0.00	0 (0.0) 0.00
Unspecified or other	29 (2.2) 0.04	19 (1.5) 0.03	24 (2.0) 0.03	34 (2.9) 0.05	29 (2.8) 0.04
Intrapartum	27 (2.0) 0.03	46 (3.6) 0.06	25 (2.1) 0.03	26 (2.2) 0.04	23 (2.2) 0.03
Congenital anomaly	448 (33.5) 0.58	458 (36.1) 0.6	426 (35.5) 0.58	407 (35.1) 0.57	344 (32.7) 0.50
Fetal	49 (3.7) 0.06	40 (3.2) 0.05	40 (3.3) 0.05	36 (3.1) 0.05	45 (4.3) 0.07
Cord	2 (0.1) 0	1 (0.1) 0	3 (0.3) 0	4 (0.3) 0.01	2 (0.2) 0.00
Placenta	31 (2.3) 0.04	25 (2.0) 0.03	36 (3.0) 0.05	27 (2.3) 0.04	28 (2.7) 0.04
Maternal	5 (0.4) 0.01	4 (0.3) 0.01	5 (0.4) 0.01	8 (0.7) 0.01	1 (0.1) 0.00
Unknown	65 (4.9) 0.08	49 (3.9) 0.06	58 (4.8) 0.08	59 (5.1) 0.08	68 (6.5) 0.10
Missing	23 (1.7) 0.03	32 (2.5) 0.04	31 (2.6) 0.04	23 (2.0) 0.03	29 (2.8) 0.04

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

[‡] per 1,000 live births

Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey

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Implications

The proportion of stillbirths classified as being of unknown cause has continued to fall in 2020 although this still represents almost one third. As indicated previously this probably reflects the concomitant increase in identification of placental causes. Approximately one in ten stillbirths is due to a congenital anomaly with just over one third of these categorised as trisomies: a rate of 0.11 per 1,000 total births. The slow but steady downward trend in intrapartum causes of stillbirth continues, potentially reflecting the learning from both local and national confidential enquiry and mortality review processes.

Although there has been a large reduction (40%) in the rate of neonatal mortality attributed to extreme prematurity, this should be interpreted with caution. The MBRRACE-UK programme only includes deaths up to 28 days so the data reported provides an incomplete picture from a clinical and family perspective as it does not include post-neonatal mortality prior to discharge home. Following the introduction of national guidance on the management of extreme preterm birth [25], introduced in October 2019, it is possible this could lead to an increase in the numbers of babies born at <24⁺⁰ weeks' gestational age being offered neonatal intensive care. We are working to understand the changes in practice and impact on neonatal care provision and mortality.

Congenital anomalies contribute significantly to neonatal mortality as well as to stillbirth rates. Stillbirth and neonatal mortality rates due to congenital anomalies have continued to fall in 2020 despite any potential issues with access to services for termination of pregnancy due to constraints imposed as a result of the pandemic. Many of these anomalies, once established, are not amenable to intervention apart from the offer of a termination of pregnancy. This has major implications for nationally-stated targets for reductions in overall perinatal mortality rates. In order to meet national targets, concerted efforts will be required to achieve and maintain consistent improvements for all other causes of perinatal mortality, in addition to increasing focus on pre-conception care for people with risk factors for congenital anomaly.

Post-mortem examination remains an important tool in determining cause of death. We have previously discussed the difference between the offer of post-mortem and consent to undertaking the examination [13]. It is likely that wider uptake by families may provide further insight into causes of perinatal mortality with consequent impact on treatment.

Thorough review of all perinatal deaths by an appropriate multidisciplinary team is essential to identify modifiable factors that could reduce future mortality [5]. Wherever possible, external reviewers should participate in reviews to ensure ‘fresh eyes’ and to avoid ‘group-think’, particularly in cases where families have raised concerns. A multidisciplinary approach to cause of death coding, as part of this review, will help to ensure the highest quality information on why babies die is available for both clinicians and families. MBRRACE-UK is developing support materials on the CODAC classification system to aid this process and to ensure consistency of coding.

Recommendation 6

Ensure cause of death coding is undertaken by a suitably qualified clinician following PMRT review, and MBRRACE UK surveillance data updated accordingly.

Recommendations from previous reports requiring improved implementation

Emphasise the importance of pre-conception health as a routine part of every health professional’s interaction with people who have risk factors for congenital anomaly.

MBRRACE-UK 2021 [11]

Investigate potential modifiable factors in the treatment of neonates when an organisation’s stabilised & adjusted neonatal mortality rate falls into the red or amber bands after exclusion of deaths due to congenital anomalies. Ensure that this encompasses both local population characteristics and quality of care provision.

Undertake placental histology examination for all babies admitted to a neonatal unit, preferably by a specialist perinatal pathologist.

MBRRACE-UK 2020 [13]

Timeliness of notification of perinatal deaths

Key findings

1. Timeliness of notification of perinatal deaths continues to improve across the UK. Around two-thirds of deaths in 2020 were notified within 7 days (66% of stillbirths and 61% of neonatal deaths) and around nine-tenths of deaths were notified within 30 days (90% of stillbirths and 85% of neonatal deaths).
2. Variation between UK countries continues to reduce. In 2020, 41% to 68% of stillbirths were notified within 7 days compared with 12% to 33% notified within 7 days in 2017. For neonatal deaths, 27% to 64% were notified within 7 days in 2020 compared with 8% to 27% notified within 7 days in 2017. The overall proportion of deaths notified within 7 days and 30 days has increased over the same period.
3. There was no correlation between the total number of deaths per Trust or Health Board and the percentage of deaths notified within 7 days or 30 days.

Data presented

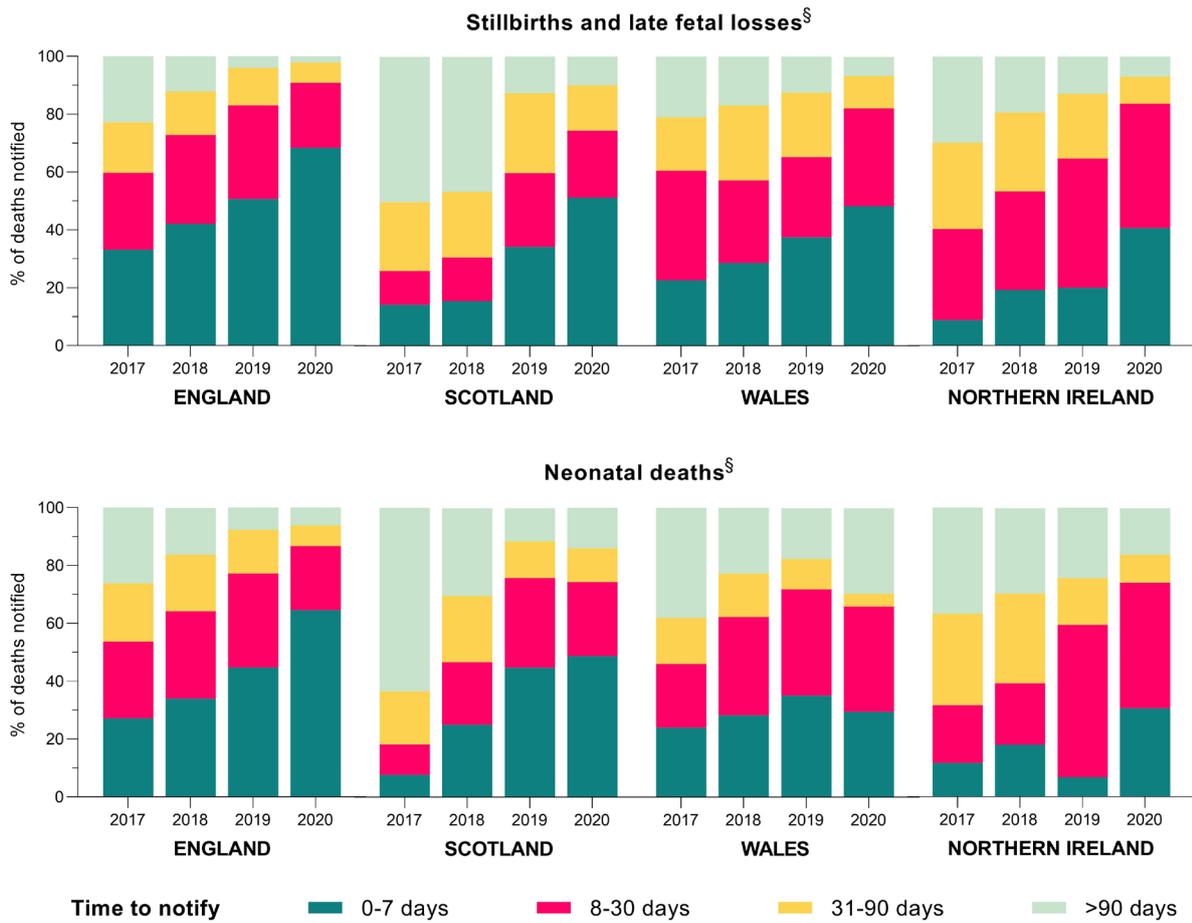
1. **Percentage of deaths of babies born from 22⁺⁰ weeks' gestational age by days to notify from 2017 to 2020.**
2. **Regional variation in the timing of the notification of perinatal deaths from 2017 to 2020.**

The data presented is derived from information submitted via the MBRRACE-UK web-based reporting system.

Results

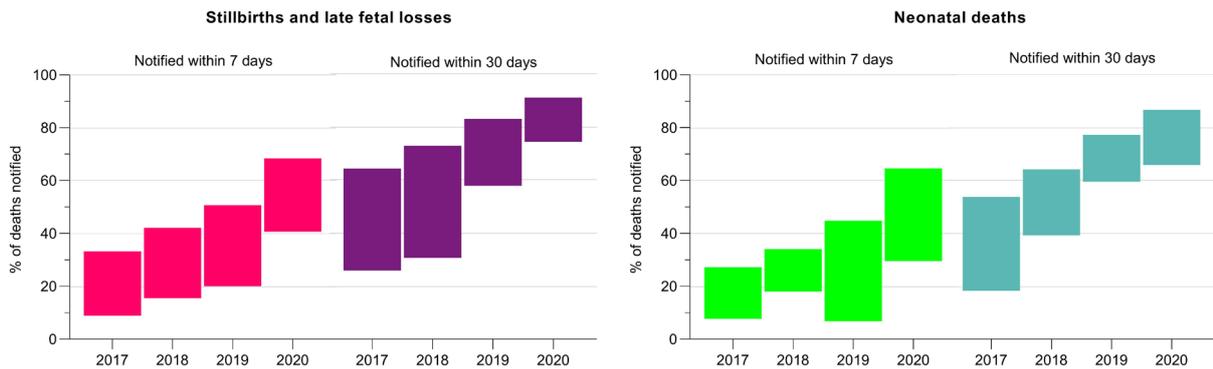
1. Timeliness of notification of perinatal deaths continues to improve across the UK (Figures 10 & 11 and Tables 20 & 21). Around two-thirds of deaths in 2020 were notified within 7 days (66% of stillbirths and 61% of neonatal deaths) and around nine-tenths of deaths (90% of stillbirths and 85% of neonatal deaths) were notified within 30 days.
2. Only 12 Trusts and Health Boards notified all of their deaths within 7 days (4 in 2019), and 51 Trusts and Health Boards notified all of their deaths within 30 days (34 in 2019).
3. Variation between UK countries has reduced considerably over the four year period (Figures 7 and 8). In 2017 12% to 33% of stillbirths were notified within 7 days, increasing to 41% to 68% notified within 7 days in 2020. For neonatal deaths progress has been slower across some of the devolved nations, meaning the 19% variation in neonatal deaths notified within 7 days in 2017 (8% to 27% notified within 30 days) has increased to 35% variation in 2020 (30% to 65% notified within 7 days). Importantly, the overall proportion of deaths notified within 7 days and 30 days has increased over the same period.
4. There was no correlation between the total number of deaths per Trust or Health Board and the percentage of deaths notified within 7 days or 30 days.
5. The number of days taken to notify deaths ranged from zero to 545 days for stillbirths (UK-wide average 16 days) and zero to 731 days for neonatal deaths (UK-wide average 29 days). A total of 35 deaths were notified more than a year after the death occurred.
6. Most late notifications (more than six months after the death) are deaths identified by MBRRACE-UK via the case ascertainment/validation process using routine data sources, which are subsequently highlighted to Trusts and Health Boards as "missing" cases (n=146 in 2020).

Figure 10: Percentage of perinatal deaths notified to MBRRACE-UK by days to notify: 2017 to 2020



[§] From 22⁺⁰ weeks' gestational age at birth, excluding terminations of pregnancy
 Data source: MBRRACE-UK

Figure 11: Regional variation in timing of notification of stillbirths and neonatal deaths: 2017 to 2020



[§] From 22⁺⁰ weeks' gestational age at birth, excluding terminations of pregnancy
 Data source: MBRRACE-UK

Table 20: Percentage of stillbirths and late fetal losses notified to MBRRACE-UK by days to notify: 2017 to 2020

Time to notify	% Notified			
	Stillbirths and late fetal losses [§]			
	2017	2018	2019	2020
0-7 days	30.8	39.2	47.9	65.5
8-30 days	26.0	29.6	31.9	23.6
31-90 days	18.3	16.3	14.6	7.8
>90 days	24.8	15.0	5.6	3.1

[§] From 22⁺⁰ weeks' gestational age at birth, excluding terminations of pregnancy
Data source: MBRRACE-UK

Table 21: Percentage of neonatal deaths notified to MBRRACE-UK by days to notify: 2017 to 2020

Time to notify	% Notified			
	Neonatal deaths [§]			
	2017	2018	2019	2020
0-7 days	25.1	32.6	42.2	60.7
8-30 days	25.3	29.5	33.8	23.9
31-90 days	20.4	20.2	15.0	7.4
>90 days	29.2	17.7	9.1	8.0

[§] From 22⁺⁰ weeks' gestational age at birth, excluding terminations of pregnancy
Data source: MBRRACE-UK

Implications

In December 2020 MBRRACE-UK recommended that Trusts and Health Boards should notify all perinatal deaths within 7 working days [13]. Whilst many of the deaths included in this year's report were notified after this particular recommendation was published, many Trusts and Health Boards were already moving towards an increased number of deaths notified within 7 days.

English Trusts are required to notify deaths within a specific time frame as part of the Maternity Incentive Scheme (MIS): currently 7 working days in Year 4. Trusts are notified of an initial breach of this standard by the MBRRACE-UK reporting system in order to ensure future compliance. A variation of this warning system has now been expanded to all regions of the UK to advise Trusts and Health Boards where a death is notified beyond the MBRRACE-UK standard of 7 days. Regular late notification should prompt Trusts and Health Boards to consider whether there are particular local factors which may be impacting on the timely notification of deaths, such as resourcing issues, poor communication between departments, or systemic or cultural problems.

Combined data submission to the National Child Mortality Database (NCMD), Child Death Overview Panel (CDOP) process and Perinatal Mortality Review Tool (PMRT) is now being rolled out as a phased process in England. The single notification portal will ensure that in future the majority of neonatal deaths are notified to MBRRACE-UK in a timely manner, as well as reducing the administrative burden for Trusts.

Whilst there remains a discrepancy between reporting requirements for stillbirths and neonatal deaths, where notification of stillbirths within 7 working days is still a substantial delay when compared to the rapid statutory notification required for most neonatal deaths, this has to be balanced with the practicalities on the ground, and particularly with the resources available within units. The MIS requirement to notify deaths within 2 working days was short-lived once it became clear that most Trusts did not have the resources to meet the standard.

The MBRRACE-UK case ascertainment process ensures that, ultimately, all deaths are identified and included in the annual surveillance report. Deaths identified in routine data sources which have not been reported to MBRRACE-UK are flagged as "missing" cases for Trusts and Health Boards to report. The number of missing cases continues to reduce as a consequence of improved reporting by Trusts and Health Boards as well as ongoing data monitoring by MBRRACE-UK. However, the identification of missing cases is contingent upon the availability of the routine data, and it may therefore be six to nine months before an unreported death is identified by MBRRACE-UK. As well leading to a financial penalty for English Trusts for failing to meeting MIS standards, unreported deaths cannot be reviewed with the PMRT, meaning families are left without any understanding of why their baby died.

As a matter of good practice Trusts and Health Boards should incorporate MBRRACE-UK notification into local processes for all perinatal deaths and, where possible, aim to implement a similar standard for the notification of stillbirths as in place for neonatal deaths.

Definitions used in this report

Late fetal loss	A baby born between 22 ⁺⁰ and 23 ⁺⁶ weeks' gestational age showing no signs of life, irrespective of when the death occurred.
Stillbirth	A baby born at or after 24 ⁺⁰ weeks' gestational age showing no signs of life, irrespective of when the death occurred.
<i>Antepartum stillbirth</i>	A baby born 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>Intrapartum stillbirth</i>	A baby born at or after 24 ⁺⁰ weeks' gestational age showing no signs of life and known to have been alive at the onset of care in labour.
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>	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>Late neonatal death</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.
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.

Abbreviations

BMI	Body Mass Index
CCG	Clinical Commissioning Group
CDOP	Child Death Overview Panel
HQIP	Healthcare Quality Improvement Partnership
LFL	Late Fetal Loss
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
NISRA	Northern Ireland Statistics and Research Agency
NRS	National Records of Scotland
ONS	Office for National Statistics
PDS	Personal Demographics Service
PHS	Public Health Scotland
PMRT	Perinatal Mortality Review Tool
RCOG	Royal College of Obstetricians and Gynaecologists
STP	Sustainability and Transformation Partnership

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It is with grateful thanks that the MBRRACE-UK collaboration would like to acknowledge the contribution of the many healthcare professionals and staff from the health service and other organisations who were involved in the reporting of perinatal deaths in the UK. It is only through this generous contribution of their time and expertise that it has been possible to conduct this national perinatal mortality surveillance and to continue the UK tradition of national self-audit to improve care for mothers, babies and their families. A full list can be found in the accompanying Tables and Figures document.

Members of the MBRRACE-UK collaboration

Members of the Leicester based MBRRACE-UK team

Members of the Oxford based MBRRACE-UK team

Office for National Statistics

National Records of Scotland

Public Health Scotland

Health Improvement Scotland

Northern Ireland Maternal and Child Health, HSC Public Health Agency

Health and Social Services Department, States of Guernsey

Health Intelligence Unit, Public Health Services, Jersey

Noble's Hospital, Isle of Man

NHS Digital

The Maternal, Newborn and Infant Clinical Outcome Review Independent Advisory Group

Healthcare Quality Improvement Partnership

MBRRACE-UK Third Sector Stakeholder Group Representatives

MBRRACE-UK Royal College and Professional Association Stakeholder Group Representatives

Reporters at all UK Trusts and Health Boards

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Change log

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1.0	First published	13 th October 2022
1.1	Figure 3, Tables 5 and 6, and explanatory text revised.	27 th October 2022
1.2	Figure 7 percentages revised for 2020	27 th January 2023
