

Maternal, Newborn and
Infant Clinical Outcome
Review Programme



MBRRACE-UK Perinatal mortality surveillance

UK perinatal deaths of babies born in 2022

State of the nation report



July 2024



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 and the Royal College of Nursing. 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 programme is funded by NHS England, the Welsh Government and, with some individual projects, other devolved administrations and Crown Dependencies.

More details can be found on [the HQIP website](#).

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 in the [acknowledgements](#).

Cohort

Deaths reported are of babies born in England, Wales, Scotland, Northern Ireland, and the Crown Dependencies, for the period 1 January 2022 to 31 December 2022 inclusive. Deaths for Guernsey are not included in 2022, but appear in trend data for previous years.

Version history

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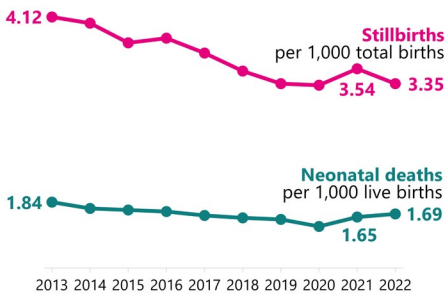
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State of the nation report

UK perinatal deaths of babies born in 2022

1. Stillbirth rates decreased across the UK in 2022, but neonatal mortality increased



Stillbirths per 1,000 total births			Neonatal deaths per 1,000 live births		
Country	2021	2022	Country	2021	2022
UK & Crown Dependencies	3.54	3.35	UK & Crown Dependencies	1.65	1.69
England	3.52	3.33	England	1.60	1.67
Scotland	3.27	3.31	Scotland	1.91	1.59
Wales	3.88	3.63	Wales	1.70	1.91
Northern Ireland	4.09	3.49	Northern Ireland	2.46	2.29

2. There was wide variation in neonatal mortality rates

Percentage of organisations with mortality rates within 5% of the group average

Comparator group	Stillbirths		Neonatal deaths	
	All deaths	Excluding deaths due to congenital anomalies	All deaths	Excluding deaths due to congenital anomalies
Level 3 NICU with surgery	100%	100%	12%	31%
Level 3 NICU	100%	100%	12%	16%
4,000 or more births (No Level 3 NICU)	100%	100%	22%	19%
2,000 to 3,999 births (No Level 3 NICU)	100%	100%	26%	24%
Fewer than 2,000 births (No Level 3 NICU)	100%	100%	37%	58%

What is a stillbirth or neonatal death?

A **stillbirth** is the death of a baby before or during birth once a pregnancy has reached 24 completed weeks.

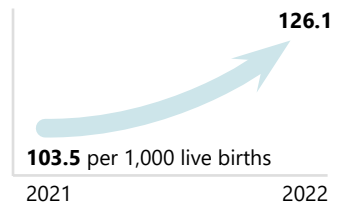
A **neonatal death** is a baby born at any gestation who lives, even briefly, but dies within 28 days of birth.

All rates in this report are for babies born from 24 completed weeks and include deaths due to congenital anomalies, unless otherwise stated.

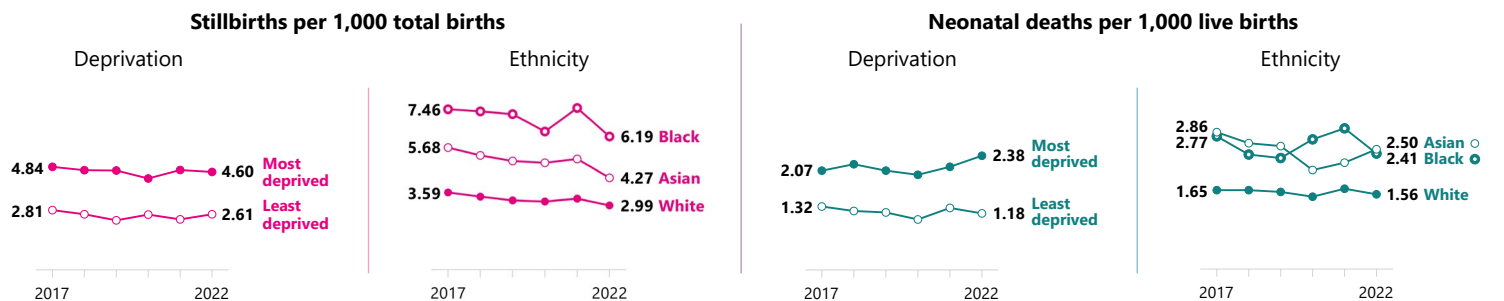
3. Stillbirth and neonatal mortality rates decreased in almost all gestational age groups

Stillbirths per 1,000 total births			Neonatal deaths per 1,000 live births		
Gestational age	2021	2022	Gestational age	2021	2022
22 to 23 weeks	472.7	405.5	22 to 23 weeks	660.5	625.2
24 to 27 weeks	212.1	↑ 216.0 ↑	24 to 27 weeks	160.0	139.6
28 to 31 weeks	81.7	74.4	28 to 31 weeks	34.0	29.5
32 to 36 weeks	16.4	12.7	32 to 36 weeks	5.35	↑ 6.58 ↑
37 to 41 weeks	1.19	1.09	37 to 41 weeks	0.66	0.62

Late neonatal mortality increased for the very smallest babies

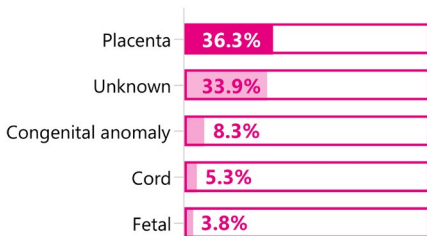


4. Despite recent improvements, inequalities in mortality rates by deprivation and ethnicity remain

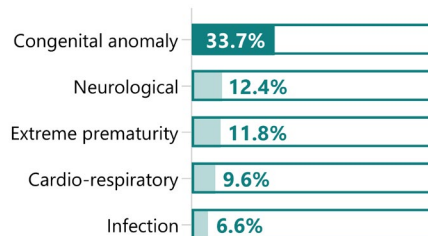


5. The most common causes of stillbirth and neonatal death were unchanged

Most common causes of stillbirth



Most common causes of neonatal death



When stillbirths and neonatal deaths are combined, congenital anomalies contributed to 17% of deaths

Recommendations and supporting data

Given the short period of time elapsed between this report and the previous “[State of the nation](#)” report (published in September 2023), where recommendations from the previous report are supported by the most recent data, these are included below. For definitions see the [MBRRACE-UK technical manual](#).

New recommendation	Target audience	Supporting data in 2022
1. Ensure neonatal intensive care capacity and resources reflect the increase in the numbers of babies born before 24 completed weeks’ gestational age receiving survival-focused care.	Commissioners	<p>Late neonatal mortality for babies born between 22 and 23 completed weeks was 126.1 per 1,000 live births in 2022, the highest rate since 2014 when MBRRACE-UK began reporting rates for these babies. This should be viewed in the context of increased provision of survival-focused care following the implementation of recent national guidance.</p> <p>See Sections 4.2. and 4.3.</p> <p>For babies born at 22 to 23 completed weeks in 2022, there were 579 live births out of 974 total births (59%). For the period 2014 to 2019, live births at this gestation made up around 50% of total births.</p> <p>The number and proportion of babies born at 22 to 23 weeks who subsequently died during the late neonatal period almost doubled between 2014 and 2022: from 41 babies (11% of all neonatal deaths) in 2014 to 73 babies (20% of all neonatal deaths) in 2022.</p> <p>See Reference Table 2.</p>

Previous recommendations	Target audience	Updated supporting data in 2022
P1. Support external clinical input into the rigorous review of all stillbirths and neonatal deaths across the UK, to identify learning and common themes related to clinical care and service provision, delivery and organisation.	UK Governments, Royal Colleges, Commissioners	<p>Extended perinatal mortality rates decreased across the UK in 2022 (UK extended perinatal mortality rate: 5.04 per 1,000 total births) after a rise in 2021, although rates remain higher than both 2019 and 2020.</p> <p>Compared with rates in 2021, stillbirth rates per 1,000 total births in 2022 were lower across all the devolved nations except Scotland, where there was a small increase: 3.35 (UK); 3.33 (England); 3.31 (Scotland); 3.63 (Wales); and 3.49 (Northern Ireland).</p> <p>There were increases in the neonatal mortality rate per 1,000 live births in England and Wales compared with 2021: 1.69 (UK); 1.67 (England); 1.59 (Scotland); 1.91 (Wales); and 2.29 (Northern Ireland).</p> <p>See Section 2.3.</p> <p>Stabilised & adjusted neonatal mortality rates continued to show wide variation, with just 21.5% of Trusts and Health Boards falling within 5% of their comparator group average</p> <p>After the exclusion of deaths due to congenital anomalies, 26.8% of Trusts and Health Boards had a stabilised & adjusted neonatal mortality rate within 5% of their comparator group average.</p> <p>See Section 3.2.</p>
P2. Ensure healthcare providers adopt and use the BAPM Perinatal Optimisation Pathway, to improve preterm outcomes.	Royal Colleges, Commissioners	<p>75% of stillbirths and late fetal losses and 74% of neonatal deaths were born preterm (before 37 completed weeks).</p> <p>See Sections 4.2. and 4.3.</p>
P3. Continue to develop and implement targeted action, at national and organisational levels, to support the reduction of direct and indirect health inequalities.	UK Governments, Royal Colleges, Commissioners	<p>Stillbirth rates for babies born to mothers from the most deprived areas decreased (from 4.69 per 1,000 total births in 2021 to 4.60 per 1,000 total births in 2022), but remain much higher than those for babies born to mothers from the least deprived areas (2.61 per 1,000 total births).</p> <p>There was an increase in the neonatal mortality rate for babies born to mothers from the most deprived areas (from 2.15 per 1,000 live births in 2021 to 2.38 per 1,000 live births in 2022), a rate which is now twice that of babies born to mothers living in the least deprived areas (1.18 per 1,000 live births).</p> <p>Stillbirth rates by ethnicity decreased in all groups after a rise in 2021, but wide ethnic inequalities remain; babies of Black ethnicity are still more than twice as likely to be stillborn than babies of White ethnicity (Black: 6.19 per 1,000 total births; White: 2.99 per 1,000 total births).</p>

Previous recommendations	Target audience	Updated supporting data in 2022
		<p>Neonatal mortality rates decreased for babies of Black and White ethnicity, with rates for babies of Black ethnicity decreasing after a two-year period of increase. However, neonatal mortality for babies of Asian ethnicity increased for the second year. Babies of both Asian and Black ethnicity continue to have much higher rates of neonatal mortality than babies of White ethnicity (Asian: 2.50 per 1,000 live births; Black: 2.41 per 1,000 live births; White: 1.56 per 1,000 live births).</p> <p>See Sections 5.3 and 5.4 and Reference Tables 3 to 6.</p>

MBRRACE-UK perinatal mortality surveillance

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State of the Nation Report

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1. Introduction

1.1. Report overview

This is the tenth MBRRACE-UK perinatal mortality surveillance report. The report is divided into five sections: perinatal mortality rates in the UK; mortality rates for Trusts and Health Boards; mortality rates by gestational age; mortality rates by ethnicity and socioeconomic deprivation; and a description of the causes of perinatal death

This report focuses on **births from 24 completed weeks' gestational age**, with the exception of the section on mortality rates by gestational age, which also includes information on births at 22 to 23 completed weeks' gestational age. This avoids the influence of the wide disparity in the classification of babies born before 24 completed weeks' gestational age as a neonatal death or a late fetal loss. **Terminations of pregnancy have been excluded from the mortality rates reported.**

Additional [supporting materials](#) to accompany this report include:

- a set of reference tables;
- a data viewer with interactive mapping, which presents mortality rates for individual organisations, including Trusts and Health Boards; and
- a technical manual containing full details of the MBRRACE-UK methodology, including definitions, case ascertainment and statistical methods.

A [HTML version of this report](#) is also available.

1.2. Definitions and terminology

For [definitions of the deaths reported to MBRRACE-UK](#) and an explanation of the [different types of mortality rates](#) reported, see the MBRRACE-UK technical manual.

In this report and the supporting materials we use the terms 'women' and 'mothers'. However, we acknowledge that not all people who access perinatal services identify as women or mothers, 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.

2. Perinatal mortality rates in the UK: 2022

2.1. Introduction

Rates of stillbirth, neonatal mortality and extended perinatal mortality by country of residence are presented for the UK and for each devolved nation for the period 2013 to 2022. This is to show trends in mortality rates over time and to enable individual nations to monitor the progress of initiatives to reduce perinatal mortality.

2.2. Key messages

- Extended perinatal mortality rates decreased across the UK in 2022 (UK extended perinatal mortality rate: 5.04 per 1,000 total births) after a rise in 2021, although rates remain higher than both 2019 and 2020.
- Compared with rates in 2021, stillbirth rates per 1,000 total births in 2022 were lower across all the devolved nations except Scotland, where there was a small increase: 3.35 (UK); 3.33 (England); 3.31 (Scotland); 3.63 (Wales); and 3.49 (Northern Ireland).
- There were increases in the neonatal mortality rate per 1,000 live births in England and Wales compared with 2021: 1.69 (UK); 1.67 (England); 1.59 (Scotland); 1.91 (Wales); and 2.29 (Northern Ireland).

2.3. Perinatal mortality rates across the UK

- ① Perinatal mortality rates decreased across most of the UK in 2022. There was a small increase in the stillbirth rate in Scotland, and neonatal mortality rates increased in England and Wales.

Figure 1: Stillbirth, neonatal, and extended perinatal mortality rates by country of residence: United Kingdom, for births from 2013 to 2022



Description of Figure 1: Line charts showing stillbirth (all, antepartum and intrapartum), neonatal death and extended perinatal mortality rates for the UK, England, Scotland, Wales and Northern Ireland, from 2013 to 2022. Stillbirths and extended perinatal deaths are shown as rates per 1,000 total births. Neonatal deaths are shown as rates per 1,000 live births. Terminations of pregnancy and births at less than 24 completed weeks' gestational age are excluded.

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

3. Perinatal mortality rates for Trusts and Health Boards

3.1. Introduction

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. In order to compare Trusts and Health Boards more fairly, stabilised & adjusted mortality rates were calculated and colour-coded according to the variation from their respective comparator group average. A complete explanation of the MBRRACE-UK methodology, including statistical methods, can be found in the [technical manual](#).

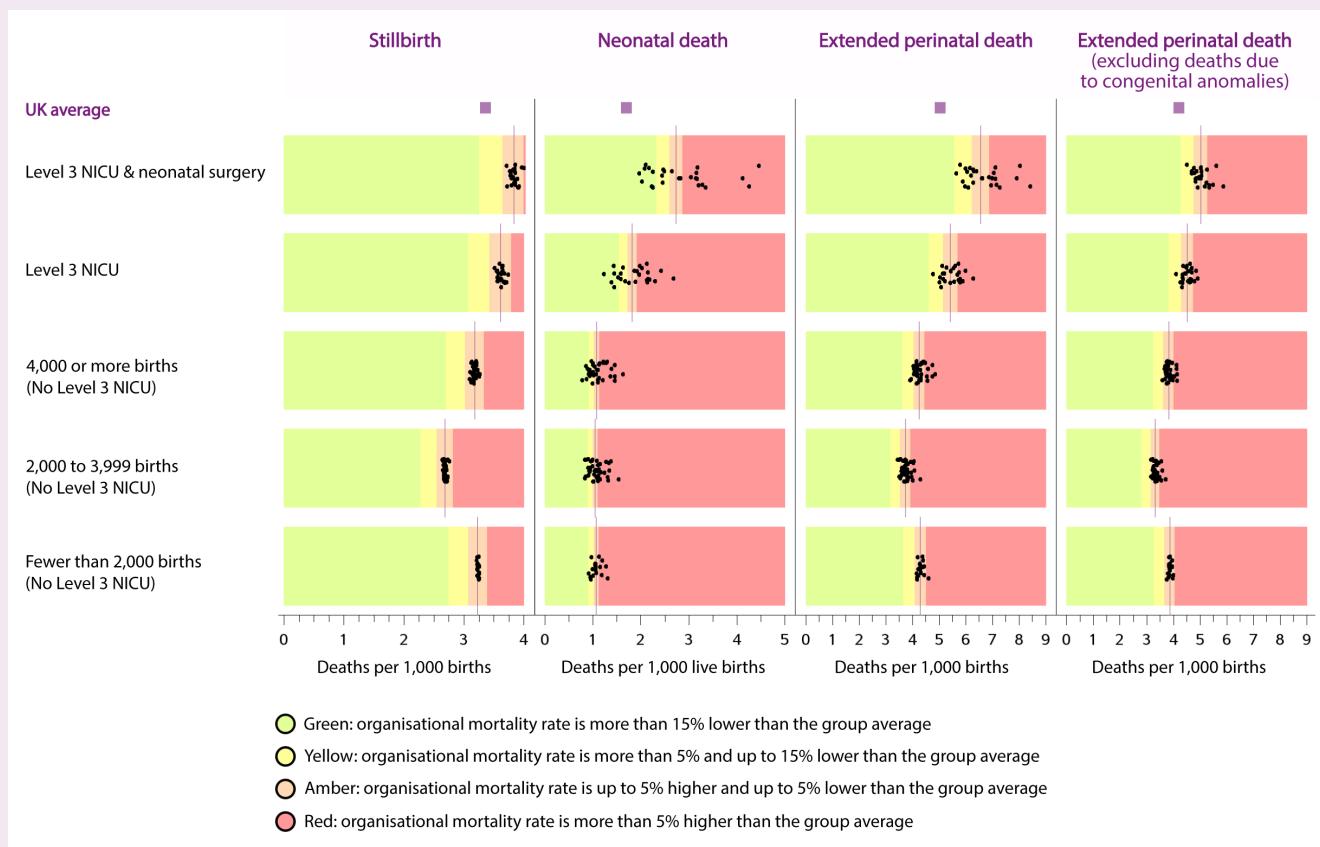
3.2. Key messages

- Stabilised & adjusted stillbirth rates in 2022 showed much more limited variation than in the years 2020 and 2021, with all Trusts and Health Boards having a stabilised & adjusted stillbirth rate within 5% of their comparator group average.
- Stabilised & adjusted neonatal mortality rates continued to show wide variation, with just 21.5% of Trusts and Health Boards falling within 5% of their comparator group average.
- After the exclusion of deaths due to congenital anomalies, 26.8% of Trusts and Health Boards had a stabilised & adjusted neonatal mortality rate within 5% of their comparator group average.

3.3. Variation in perinatal mortality rates within Trust and Health Board comparator groups

① There was wide variation in neonatal mortality rates, even when deaths due to congenital anomalies were excluded.

Figure 2: Stabilised & adjusted stillbirth, neonatal and extended perinatal mortality rates for Trusts and Health Boards by comparator group: United Kingdom and Crown Dependencies, for births in 2022



Description of Figure 2: Scatter chart showing the variation in stabilised & adjusted stillbirth, neonatal death and extended perinatal mortality rates within Trust and Health Board comparator groups in 2022. Trusts and Health Boards are grouped according to their level of service provision, with dots representing individual Trusts and Health Boards and a vertical line representing the comparator group average. Extended perinatal deaths are also shown without deaths due to congenital anomalies. Stillbirths and extended perinatal mortality rates are shown as rates per 1,000 total births. Neonatal mortality rates are shown as rates per 1,000 live births. Terminations of pregnancy and births at less than 24 completed weeks' gestational age are excluded.

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

Mortality rates for individual Trusts and Health Boards, including comparison to their respective comparator group average, can be found in the [data viewer](#). The viewer also contains details of mortality rates for other organisations responsible for providing or commissioning perinatal services.

4. Mortality rates by gestational age

4.1. Introduction

Mortality rates by gestational age group in completed weeks are presented to monitor the progress of national initiatives to reduce preterm births.

4.2. Key messages

- Late fetal loss and stillbirth rates decreased in 2022 compared with 2021 for all gestational age groups, except for babies born between 24 and 27 completed weeks where there was an increase from 212.1 per 1,000 total births in 2021 to 216.0 in 2022.
- Neonatal mortality decreased in 2022 across all gestational age groups, except for babies born between 32 and 36 completed weeks, where there was an increase from 5.35 per 1,000 live births in 2021 to 6.58 per 1,000 live births in 2022.
- Late neonatal mortality for babies born between 22 and 23 completed weeks was 126.1 per 1,000 live births in 2022, the highest rate since 2014 when MBRRACE-UK began reporting rates for these babies. This should be viewed in the context of [increased provision](#) of survival-focused care following the implementation of recent [national guidance](#).
- 75% of stillbirths and late fetal losses and 74% of neonatal deaths were born preterm (before 37 completed weeks).

4.3. Late fetal loss, stillbirth and neonatal mortality rates by gestational age

① Late fetal loss, stillbirth and neonatal mortality rates decreased in almost all gestational age groups between 2021 and 2022.

Figure 3: Late fetal loss, stillbirth and neonatal mortality rates and proportions by gestational age at birth: United Kingdom and Crown Dependencies, for births from 2017 to 2022



Description of Figure 3: Combined line and bar charts showing rates and proportions of stillbirths and neonatal deaths for babies born in the UK from 2017 to 2022, by gestational age group in completed weeks: 22 to 23, 24 to 27, 28 to 31, 32 to 36, 37 to 41. Deaths of babies born at 42 weeks and above are not shown due to the small numbers of births at this gestation. Stillbirths are shown as rates per 1,000 total births. Neonatal deaths are shown as rates per 1,000 live births. Terminations of pregnancy are excluded. **The left Y-axis scales are different for each chart.**

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

5. Mortality rates by socioeconomic deprivation and ethnicity

5.1. Introduction

To explore inequalities in perinatal outcomes, rates of stillbirth and neonatal death are compared for area level socioeconomic deprivation based on the mother's postcode of residence at the time of the birth, and the baby's ethnic group.

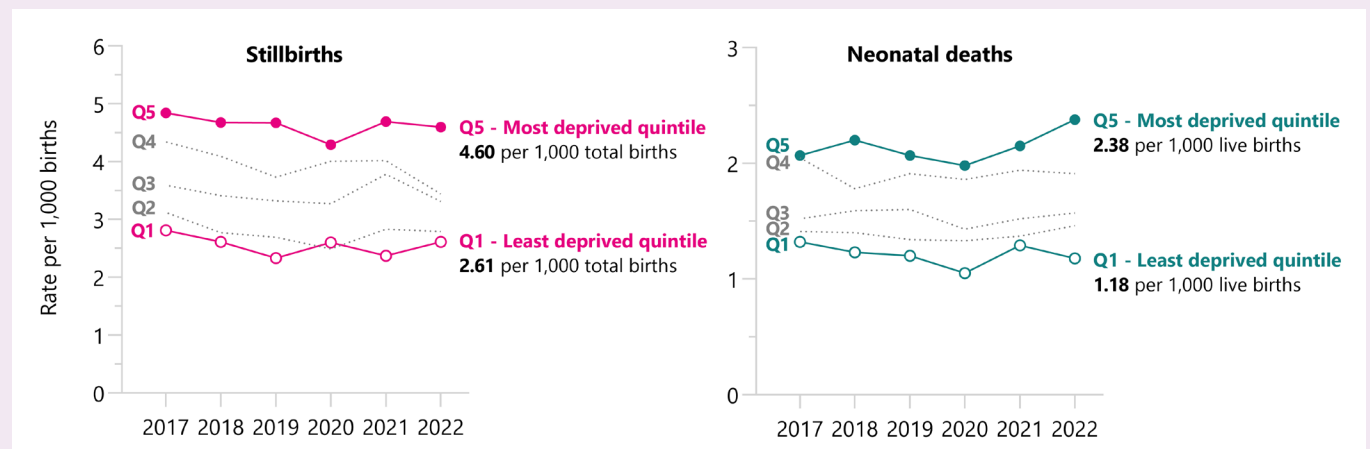
5.2. Key messages

- Stillbirth rates for babies born to mothers from the most deprived areas decreased (from 4.69 per 1,000 total births in 2021 to 4.60 per 1,000 total births in 2022), but remain much higher than those for babies born to mothers from the least deprived areas (2.61 per 1,000 total births).
- There was an increase in the neonatal mortality rate for babies born to mothers from the most deprived areas (from 2.15 per 1,000 live births in 2021 to 2.38 per 1,000 live births in 2022), a rate which is now twice that of babies born to mothers living in the least deprived areas (1.18 per 1,000 live births).
- Stillbirth rates by ethnicity decreased in all groups after a rise in 2021, but wide ethnic inequalities remain; babies of Black ethnicity are still more than twice as likely to be stillborn than babies of White ethnicity (Black: 6.19 per 1,000 total births; White: 2.99 per 1,000 total births).
- Neonatal mortality rates decreased for babies of Black and White ethnicity, with rates for babies of Black ethnicity decreasing after a two-year period of increase. However, neonatal mortality for babies of Asian ethnicity increased for the second year. Babies of both Asian and Black ethnicity continue to have much higher rates of neonatal mortality than babies of White ethnicity (Asian: 2.50 per 1,000 live births; Black: 2.41 per 1,000 live births; White: 1.56 per 1,000 live births).

5.3. Socio-economic deprivation

- ① Neonatal mortality rates for babies born to mothers from the most deprived areas increased for the second year, and are now twice that of babies born to mothers from the least deprived areas.

Figure 4: Stillbirth and neonatal mortality rates by mothers' socio-economic deprivation quintile of residence: United Kingdom, for births in 2017 to 2022



Description of Figure 4: Line charts showing stillbirth and neonatal mortality rates by level of socio-economic deprivation, between 2017 and 2022. Deprivation is shown by quintiles numbered 1 to 5, and the most deprived quintile (Q5) is compared to the least deprived quintile (Q1). Stillbirths are shown as rates per 1,000 total births. Neonatal deaths are shown as rates per 1,000 live births. Terminations of pregnancy and births at less than 24 completed weeks' gestational age are excluded.

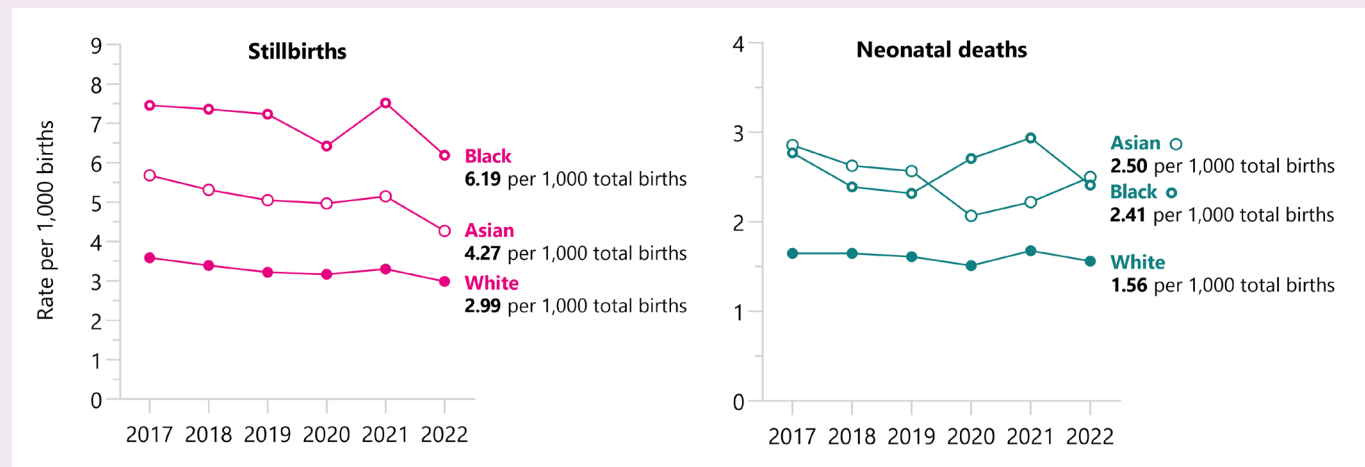
Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey.

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

5.4. Ethnicity

- ① Despite a decline in stillbirth rates for all ethnic groups, significant ethnic disparities persist. Babies of Asian and Black ethnicity still have much higher mortality rates than babies of White ethnicity.

Figure 5: Stillbirth and neonatal mortality rates by babies' ethnicity: United Kingdom and Crown Dependencies, for births in 2017 to 2022



Description of Figure 5: Line charts showing stillbirth and neonatal mortality rates by babies' ethnicity, between 2017 and 2022. Stillbirths are shown as rates per 1,000 total births. Neonatal deaths are shown as rates per 1,000 live births. Terminations of pregnancy and births at less than 24 completed weeks' gestational age are excluded.

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

Mortality rates using more refined ethnic categories can be found in the accompanying [reference tables](#). As the mortality rates for some groups are based on small numbers they are not presented here, and may be suppressed in the reference tables.

6. Causes of perinatal death

6.1. Introduction

Causes of death are reported to MBRRACE-UK using the [Cause of Death & Associated Conditions \(CODAC\) classification system](#). 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 for all stillbirths and neonatal deaths is available in the accompanying [reference tables](#).

6.2. Key messages

- The most common causes of stillbirth were in the placenta, congenital anomaly, cord and fetal categories. There remains a high proportion of stillbirths with an unknown cause of death (33.9%).
- The most common causes of neonatal death were in the congenital anomaly, extreme prematurity, neurological, cardio-respiratory and infection categories.
- Congenital anomalies continue to contribute significantly to mortality rates, comprising 8.3% of stillbirths and 33.7% of neonatal deaths.

6.3. Stillbirth and neonatal mortality rates by cause of death

① The most common causes of stillbirth were in the placenta, congenital anomaly, cord and fetal categories. The most common causes of neonatal death were in the congenital anomaly, extreme prematurity, neurological, cardio-respiratory and infection categories.

Figure 6: Highest stillbirth and neonatal mortality rates by CODAC cause of death: United Kingdom and Crown Dependencies, for births in 2017 to 2022



Description of Figure 6: Combined line and bar charts showing the five highest stillbirth and neonatal mortality rates by cause of death, between 2017 and 2022. Cause of death is shown by CODAC level 1 category for stillbirths and levels 1 and 2 for neonatal deaths. Stillbirths are shown as rates per 1,000 total births. Neonatal deaths are shown as rates per 1,000 live births. Terminations of pregnancy and births at less than 24 completed weeks' gestational age are excluded.

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