

National Maternity and Perinatal Audit

Ethnic and Socio-economic Inequalities in NHS Maternity and Perinatal Care for Women and their Babies

Assessing care using data from births between 1 April 2015 and 31 March 2018 across England, Scotland and Wales



The National Maternity and Perinatal Audit (NMPA) is led by the Royal College of Obstetricians and Gynaecologists (RCOG) in partnership with the Royal College of Midwives (RCM), the Royal College of Paediatrics and Child Health (RCPCH) and the London School of Hygiene and Tropical Medicine (LSHTM).

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We are also very grateful for the support and insight provided by our advisory group for this project and by members of both the NMPA Clinical Reference Group and the Women and Families Involvement Group.

The NMPA Project Team and Board

Foreword

Summer 2020 saw the launch of the Royal College of Obstetricians and Gynaecologists' Race Equality Taskforce as a response to the persisting inequality in outcomes for women of different racial backgrounds. Our aim is simple; to challenge and reverse "the disparity in health outcomes experienced by Black, Asian and other ethnic minority girls and women in the UK".^a

From its inception, we have continually encountered the need for more and better research, to deepen our understanding of where these differences exist, why they occur and how we can more effectively understand and overcome the barriers and factors which lead to racial health differences. Maternal and neonatal morbidity and mortality is one area of women's health where racial inequality is most visible. Every death and every poor outcome is one too many. For a group to experience disproportionately poorer outcomes without understanding why this occurs, is to embed such outcomes for generations to come.

There remains a significant data and research gap for women and their babies, from different racial backgrounds. What we do know is that Black, Asian and other ethnic minority women are overrepresented in the groups that experience the worst outcomes. We also know that race, racism and health outcomes intersect with the wider picture of peoples' identities, including socioeconomic status, gender, sexuality and disability combining to create the situation that we see today. It is vital that we examine all aspects of maternity care for all women if we hope to reverse this unacceptable reality experienced by so many.

As the Race Equality Taskforce, we welcome this important piece of work, which provides important data on outcomes relating to ethnicity and deprivation. It is a significant piece of a large puzzle. To complete this puzzle, we support the clear call for the prioritisation of research to understand and address the fundamental drivers of inequalities in maternity care, and to further explore the experiences of the women who access maternity services. In doing so, we must challenge our understanding of how race as a social construct underpins individual women's health outcomes and where race and or ethnicity, influences the outcomes that we see today. Through it all, we must make sure we are listening to all women, especially those who are not often heard.

Recognising inequalities is a first step to understanding and challenging the social, economic and political contexts that inform the way we all live our lives and the health choices we make. We know inequalities exist through the complex interplay of barriers and factors at both the macro-level and at the level of the individual. To meaningfully improve health statistics for all women, interventions must operate at these multiple levels and acknowledge the upstream societal factors which result in downstream individual outcomes. With this in mind, we are calling on the UK Government to commit to a time-limited target to reduce maternal inequities, to drive urgent cross-departmental innovation, improvement and investment.

There is more to do, and much to learn, both from this report and the future research that will stem from it. This report may suggest a long path ahead to achieve equity, but throughout our time on the taskforce we have been uplifted by the incredible people we have had the privilege to work with. From medical students, trainees and others within the NHS and academia, to the incredible campaigners who have focused governments and media on an unacceptable situation, all are

^a Race Equality Taskforce. *Purpose and Role*. RCOG: 2020 [<https://www.rcog.org.uk/en/news/campaigns-and-opinions/race-equality-taskforce/>]

bringing their skills, time and theirs and their families' experiences, to ensure all women receive the quality and safe care they deserve and are entitled to.

This report is vital to our work, and those of our colleagues working to achieve equitable care. We would like to thank the NMPA Project Team and Board, and HQIP for their support and pledge to continue to work with all agents committed to equitable, safe and quality maternity care.

Dr Christine Ekechi
Co-Chair
Race Equality Taskforce, RCOG

Abbreviations and glossary

Definitions for abbreviations and terms that are not specific to this sprint audit can be found in the [NMPA Clinical Report on 2016/17 births](#).¹

AGA	Appropriate for gestational age. A baby with estimated fetal weight or actual birthweight between the 10th and 90th centile for gestational age, as defined by UK 1990 population centiles.
Apgar score	An Apgar score is determined by evaluating the baby's physiological condition at specific time points – often 1 minute and 5 minutes. Five criteria (appearance, pulse, grimace, activity and respiration) are scored between 0 and 2, with the resulting combined score ranging from 0 to 10. A score of 7–10 is considered within the 'normal range' and a score of less than 7 is a sign that the baby needs medical attention.
BMI	Body mass index. An estimate of body fat based on height and weight. Measured in kilograms of weight, divided by squared height in metres (kg/m ²).
Great Britain (GB)	The island consisting of England, Scotland and Wales.
Index of Multiple Deprivation (IMD)	A within-country area-based measurement of relative socio-economic deprivation.
LGA	Large for gestational age. A baby with estimated fetal weight or actual birthweight greater than the 90th centile for gestational age, as defined by UK 1990 population centiles.
LSOA	Lower-layer super output area.
NNRD	National Neonatal Research Database.
ONS	Office for National Statistics.
SBLCB	Saving Babies Lives Care Bundle.
SGA	Small for gestational age. A baby with estimated fetal weight or actual birthweight lower than the 10th centile for gestational age, as defined by UK 1990 population centiles.

Throughout this document we use the term 'birthing people' as well as 'women'. It is important to acknowledge that it is not only people who identify as women who access maternity, reproductive and gynaecology services.

Executive summary

Introduction

The purpose of this report is to describe inequalities in maternity and perinatal care for women and their babies in England, Scotland and Wales during the period 1 April 2015 to 31 March 2018. Using routinely collected data, care and outcomes experienced by women and babies using NHS maternity services are measured and stratified by ethnicity and by Index of Multiple Deprivation (IMD), a proxy for socio-economic deprivation. This report focuses on the following maternal measures:

- caesarean birth (presented as elective, emergency and both combined)
- birth without intervention
- major postpartum haemorrhage (1500 ml or more)

and the following perinatal measures:

- an Apgar score of less than 7 at 5 minutes
- breast milk at first feed
- neonatal unit admission at term.

Methods

This report uses existing NMPA linked datasets. Ethnicity is coded using the Office for National Statistics (ONS) 2001 census categorisation of 16+1 codes for ethnicity,² grouped into white, South Asian, Black and Other (comprising 'Mixed' and 'Other' combined). Socio-economic deprivation is measured using the Index of Multiple Deprivation (IMD), an area-based measurement of multiple deprivation calculated for each lower-layer super output area (LSOA) in England and Wales, and data zone in Scotland.³ IMD is based on residential postcode and grouped into quintiles of national distribution (quintile 1 = least deprived to quintile 5 = most deprived) for analysis. Results for each maternal and perinatal measure are reported by the mother's ethnic group and IMD quintile.

The results presented in this report are crude and therefore descriptive. The results do not take into account the interactions that contributory factors, such as parity, age, pre-existing co-morbidities, ethnicity and deprivation may have on each other, the complexities of which are not easily interpreted in an audit report such as this.

An advisory group comprising professionals and a diverse range of service user representatives with experience of accessing maternity care was involved in the sprint audit. The advisory group was involved in the choice of measures for inclusion in this report, interpretation of results, identifying key messages, and reviewing the draft report and recommendations.

Key findings

Our results demonstrate differences in outcomes of maternity and perinatal care among women and birthing people, and their babies, via comparisons between those living in the most deprived and the least deprived areas in Great Britain, and in those from ethnic minority groups versus white ethnic groups.

Women from South Asian and Black ethnic groups and those from the most deprived areas had higher rates of hypertension and diabetes when compared with women from white ethnic groups and those in the least deprived areas. Smoking was considerably higher among women and birthing people from white ethnic groups and those in the most deprived quintile.

Women from Black ethnic groups had a higher rate of experiencing a birth without intervention. While this may be desirable in many situations, it may also represent circumstances where interventions are desired or indicated but do not occur. Rates of caesarean birth (both elective and emergency combined) and rates of emergency caesarean birth were highest for women from Black ethnic groups and higher for women from South Asian groups when compared with those from white ethnic groups. Women and birthing people from Black ethnic groups had higher rates of major postpartum haemorrhage (1500 ml or more) when compared with women and birthing people from white ethnic groups. In contrast to the usual association of increased deprivation with increased morbidity, a decreasing trend for major postpartum haemorrhage (1500 ml or more) was observed from the least to most deprived.

Babies born to women from South Asian ethnic groups were less likely to have an Apgar score of less than 7 at 5 minutes but were more likely to be admitted to a neonatal unit at term when compared with babies born to women from white ethnic groups. Babies born to women from Black ethnic groups were more likely to be assessed as having an Apgar score of less than 7 at 5 minutes and were more likely to be admitted to a neonatal unit at term when compared with babies born to women from white ethnic groups. Rates of receiving breast milk at their first feed were significantly lower for babies born to white women and to those living in the most deprived areas.

We also found areas of concern with regard to data completeness and rates of missing data by ethnic group and IMD. Our results show 1 in 10 women and birthing people in Great Britain (1 in 5 in Scotland) did not have their ethnic group recorded, and IMD was missing for 6%.

Recommendations

- R1 Target efforts for a life-course approach to improve the health of people, addressing the wider social determinants of health as well as specific health-related risk factors. Offer individualised preconception and antenatal information tailored to their circumstances, including BMI, smoking, pre-existing comorbidities (hypertension and type 2 diabetes) and whether this is their first birth or they have previously had a caesarean birth.

(Audience: Healthcare professionals working in maternity services, maternity services providers, general practitioners, primary care providers, public health policy makers)

- R2 Target efforts to reduce smoking. Audit rates of carbon monoxide testing and referrals for smoking cessation for women during pregnancy, and audit compliance with monitoring for fetal growth restriction.

(Audience: Healthcare professionals working in maternity services, maternity services providers, general practitioners, primary care providers, stop smoking services, public health policy makers)

- R3 Support research and investigation into why women from ethnic minority groups and more deprived areas have higher rates of stillbirth, taking into consideration differences in care, specific risk factors and the wider determinants of health.

(Audience: National Institute for Health Research, Health and Care Research Wales and NHS Research Scotland in consultation with the Royal College of Obstetricians and Gynaecologists and policy makers, service planners/commissioners, service managers and healthcare professionals working for maternity services)

- R4 Improve availability and quality of information about choices during pregnancy and labour, with particular attention to the development of evidence-based shared decision-making tools for place, mode and timing of birth and pain relief options. Consider using the IDECIDE tool (when available).
(Audience: Healthcare professionals working in maternity services, maternity services providers, NHS England, NHS Scotland, NHS Wales)
- R5 Avoid term admissions to a neonatal unit through improving transitional care provision, by establishing facilities where they are not currently available; or in hospitals that do have transitional care facilities, by expanding cot space availability and increasing numbers of appropriately trained staff.
(Audience: Maternity and neonatal services providers)
- R6 Offer all women breastfeeding information and support, and target support in specific areas where breastfeeding rates are lowest (see also Priority 4c, intervention 3 of the Equity and Equality: Guidance for Local Maternity Systems).
(Audience: Healthcare professionals working in maternity services, health visitors, primary care providers, maternity care services)
- R7 Review equality and diversity training provision and update to include the risks associated with deprivation, and how to recognise and avoid unconscious bias (see also Priority 4d, intervention 1 of the Equity and Equality: Guidance for Local Maternity Systems).
(Audience: Local trusts and health boards, medical Royal Colleges, Royal Colleges of Nursing and Midwifery, General Medical Council, Nursing and Midwifery Council, Health and Care Professions Council, higher education institutions)
- R8 Ethnicity should be asked of and accurately recorded for all pregnant people using agreed ethnic group coding systems that should be updated regularly in accordance with the most current census groups. Consideration should be given to methods for self-reporting of ethnicity whenever possible (see also Priority 3, intervention 1 of the Equity and Equality: Guidance for Local Maternity Systems).
(Audience: Healthcare professionals working in maternity services, maternity service providers, general practitioners, primary care providers, NHS England, NHS Scotland, NHS Wales)
- R9 Review the ethnic diversity and rates of socio-economic deprivation in the local area of each NHS trust or board and consider ways to reduce inequalities in healthcare outcomes (see also Priority 4, intervention 1 of the Equity and Equality: Guidance for Local Maternity Systems).
(Audience: Local trusts and health boards, primary care providers, public health bodies, local government)
- R10 Prioritise further research in NHS maternity and perinatal care that could improve outcomes for women, and their babies, from ethnic minority groups and those in the most deprived areas. Undertaking quantitative analysis to investigate ethnic and socio-economic inequalities and report on the mediating factors and causal pathways; along with qualitative research to include exploring the experiences of people accessing maternity care.
(Audience: National Institute for Health Research, UK Research and Innovation, Health and Care Research Wales and NHS Research Scotland in consultation with the Royal College of Obstetricians and Gynaecologists and policy makers, service planners/commissioners, service managers and healthcare professionals working for maternity services)

Key findings, recommendations, report evidence and related national guidance

	Key finding (KF) Recommendation (R) (Audience)	Report findings underlying this recommendation	Page	Related national guidance
KF1	<p>Rates of a BMI of 30 kg/m² or above and of hypertension were higher for women from Black ethnic groups when compared with women from all other ethnic groups. Rates of pre-existing diabetes were higher for women from South Asian and Black ethnic groups when compared with women from white and Other groups.</p> <p>Rates of a BMI of 30 kg/m² or above and of hypertension were higher for women in the most deprived areas when compared with those in the least deprived areas.</p>	Tables 2 and 3	8–9	NHS England and NHS Improvement (2020) <i>Better Births Four Years On</i> , ⁴ NHS England (2019) <i>The NHS Long Term Plan</i> , ⁵ NHS England (2019) <i>Saving Babies' Lives Version Two</i> , ⁶ Welsh Government (2019) <i>Maternity Care in Wales: A Five Year Vision for the Future (2019–2024)</i> , ⁷ NICE (2013) <i>BMI: Preventing Ill Health and Premature Death in Black, Asian and Other Minority Ethnic Groups</i> , ⁸ Scottish Government (2011) <i>Reducing Antenatal Health Inequalities: Outcome Focused Evidence into Action Guidance</i> ⁹
R1	<p>Target efforts for a life-course approach to improve the health people addressing the wider determinants of health as well as specific risk factors. Offer individualised preconception and antenatal information tailored to their circumstances, including BMI, smoking, pre-existing comorbidities (hypertension and type 2 diabetes) and whether this is their first birth or they have previously had a caesarean birth.</p> <p><i>(Healthcare professionals working in maternity services, maternity services providers, general practitioners, primary care providers, integrated care systems, public health policy makers)</i></p>	KF1		

	Key finding (KF) Recommendation (R) (Audience)	Report findings underlying this recommendation	Page	Related national guidance
KF2	Rates of smoking at birth were significantly higher in the most deprived quintile when compared with the least deprived quintile, and in women from white ethnic groups when compared with all other ethnic groups. Mothers under the age of 20 years are more likely to smoke before and during pregnancy.	Tables 2 and 3, Interpretation	8–9, 18	NHS England and NHS Improvement (2020) <i>Better Births Four Years On</i> , ⁴ NHS England (2019) <i>The NHS Long Term Plan</i> , ⁵ NHS England (2019) <i>Saving Babies' Lives Version Two</i> , ⁶ Welsh Government (2019) <i>Maternity Care in Wales: A Five Year Vision for the Future (2019–2024)</i> , ⁷ NHS England (2016) <i>Saving Babies' Lives: A Care Bundle for Reducing Stillbirth</i> , ¹⁰ Scottish Government (2011) <i>Reducing Antenatal Health Inequalities: Outcome Focused Evidence into Action Guidance</i> ⁹
KF3	Babies born to women from South Asian and Black ethnic groups had higher rates of preterm birth before 32 weeks of gestation than babies born to white women. An increasing trend in the rates of preterm birth before 37 weeks of gestation was observed with increasing deprivation.	Tables 4 and 5	10–11	
KF4	Rates of a small-for-gestational-age birthweight were highest for babies born to women from South Asian ethnic groups, and were also higher for babies born to women from Black and Other ethnic groups when compared with babies born to white women.	Table 4	10	
KF5	While overall stillbirth rates were low, rates were higher for babies born to women from South Asian and Black ethnic groups when compared with white and Other ethnic groups, and higher rates were associated with higher deprivation.	Tables 4 and 5	10–11	
R2	Target efforts to reduce smoking. Audit rates of carbon monoxide testing and referrals for smoking cessation for women during pregnancy, and audit compliance with monitoring for fetal growth restriction. <i>(Healthcare professionals working in maternity services, maternity services providers, general practitioners, primary care providers, stop smoking services, integrated care systems, public health policy makers)</i>	KF2–5		
R3	Support research and investigation into why women from ethnic minority groups and more deprived areas have higher rates of stillbirth, taking into consideration differences in care, specific risk factors and the wider determinants of health. <i>(National Institute for Health Research, Health and Care Research Wales and NHS Research Scotland in consultation with the Royal College of Obstetricians and Gynaecologists and policy makers, service planners/commissioners, service managers and healthcare professionals working for maternity services)</i>	KF2–5		NHS England (2016) <i>Saving Babies' Lives: A Care Bundle for Reducing Stillbirth</i> ¹⁰

	Key finding (KF) Recommendation (R) (Audience)	Report findings underlying this recommendation	Page	Related national guidance
KF6	Women from Black ethnic groups had higher rates of birth without intervention and of caesarean birth (elective, emergency, and both combined) when compared with white women.	Figure 1, Interpretation, Tables 6, 8, 10 and 12	14, 18, 27, 29, 31, 33	Birthrights (2020) <i>IDECIDE – a new consent tool is on its way</i> , ¹¹ NHS England (2019) <i>The NHS Long Term Plan</i> , ⁵ Welsh Government (2019) <i>Maternity Care in Wales: A Five Year Vision for the Future (2019–2024)</i> , ⁷ Scottish Government (2017) <i>The Best Start: Five-Year Plan for Maternity and Neonatal Care</i> ¹²
KF7	Women from Black ethnic groups had a higher rate of major postpartum haemorrhage (1500 ml or more). A decreasing trend for major postpartum haemorrhage was observed from the least to most deprived quintiles.	Figures 1 and 2, Interpretation, Tables 6–9, 12 and 13	14–15, 18, 27–30, 33–34	
R4	Improve availability and quality of information about choices during pregnancy and labour, with particular attention to the development of evidence-based shared decision-making tools for place, mode and time of birth and pain relief options. Consider using the IDECIDE tool (when available). <i>(Healthcare professionals working in maternity services, maternity services providers, integrated care systems, NHS England, NHS Scotland, NHS Wales)</i>	KF6		
KF8	When compared with babies born to white women, babies born to South Asian women had a lower rate of an Apgar score of less than 7 at 5 minutes, but their rate of term neonatal unit admission was higher; babies born to Black women had higher rates of both an Apgar score of less than 7 at 5 minutes and term neonatal unit admission when compared with babies born to white women.	Figure 3, interpretation, Tables 6, 8, 10 and 12	16, 18, 27, 29, 31, 33	Scottish Government (2017) <i>The Best Start: Five-Year Plan for Maternity and Neonatal Care</i> , ¹² NHS Improvement (2017) <i>Reducing Harm Leading to Avoidable Admission of Full-Term Babies into Neonatal Units: Findings and Resources for Improvement</i> , ¹³ British Association of Perinatal Medicine (2017) <i>A Framework for Neonatal Transitional Care</i> , ¹⁴ NHS Wales (2017) <i>All Wales Neonatal Standards 3rd Edition</i> ¹⁵
KF9	Increasing trends from least to most deprived quintiles were observed for rates of babies being assessed as having an Apgar score of less than 7 at 5 minutes and for rates of term admission to a neonatal unit.	Figure 4, interpretation, Tables 7, 9, 11 and 13	16, 18, 28, 30, 32, 34	
R5	Avoid term admission to a neonatal unit through improving transitional care provision, by establishing facilities where they are not currently available; or in hospitals that do have transitional care facilities, by expanding cot space availability and increasing numbers of appropriately trained staff. <i>(Maternity and neonatal services providers)</i>			

Key finding (KF) Recommendation (R) (Audience)	Report findings underlying this recommendation	Page	Related national guidance
KF10 Rates of receiving breast milk at the first feed were lowest for babies born to women from white ethnic groups and those from the most deprived areas. Teenage mothers (less than 20 years of age) are less likely to initiate breastfeeding. The UK sees a significant drop-off in breastfeeding rates by 3 months after birth.	Interpretation and Tables 6–13	18, 27–34	NHS England (2021) <i>Equity and equality: Guidance for local maternity systems</i> , ¹⁶ Unicef UK (2017) <i>Guide to the Unicef UK Baby Friendly Initiative Standards</i> , ¹⁷ NHS England (2019) <i>The NHS Long Term Plan</i> , ⁵ Welsh Government (2019) <i>Maternity Care in Wales: A Five Year Vision for the Future (2019–2024)</i> , ⁷ Scottish Government (2017) <i>The Best Start: Five-Year Plan for Maternity and Neonatal Care</i> ¹²
R6 Offer all women breastfeeding information and support, and target support in specific areas where breastfeeding rates are lowest (see also Priority 4c, intervention 3 of the Equity and Equality: Guidance for Local Maternity Systems). <i>(Healthcare professionals working in maternity services, health visitors, maternity care services, primary care providers, integrated care systems)</i>			
R7 Review equality and diversity training provision and update to include the risks associated with deprivation, and how to recognise and avoid unconscious bias (see also Priority 4d, intervention 1 of the Equity and Equality: Guidance for Local Maternity Systems). <i>(Local trusts and health boards, medical Royal Colleges, Royal Colleges of Nursing and Midwifery, General Medical Council, Nursing and Midwifery Council, Health and Care Professions Council, higher education institutions)</i>			NHS England (2021) <i>Equity and equality: Guidance for local maternity systems</i> ¹⁶
KF11 Ethnicity data were missing for 1 in 10 women across Great Britain (1 in 5 in Scotland).	Table 1	7	
R8 Ethnicity should be asked of and accurately recorded for all pregnant people using agreed ethnic group coding systems that should be updated regularly in accordance with the most current census groups. Consideration should be given to methods for self-reporting of ethnicity whenever possible (see also Priority 3, intervention 1 of the Equity and Equality: Guidance for Local Maternity Systems). <i>(Healthcare professionals working in maternity services, maternity service providers, general practitioners, primary care providers, integrated care systems, NHS England, NHS Scotland, NHS Wales)</i>	KF9		NHS England (2021) <i>Equity and equality: Guidance for local maternity systems</i> ¹⁶

NMPA: Ethnic and socioeconomic inequalities

	Key finding (KF) Recommendation (R) (Audience)	Report findings underlying this recommendation	Page	Related national guidance
KF12	IMD data were missing for 6% of women giving birth in Great Britain overall (6% in England, 2% in Scotland and 1% in Wales). Almost 50% of women were living in the two most deprived quintiles, and this was observed in each devolved nation.	Table 1	7	
R9	<p>Review the ethnic diversity and rates of socio-economic deprivation in the local area of each NHS trust or board and consider ways to reduce inequalities in healthcare outcomes (see also Priority 4, intervention 1 of the Equity and Equality: Guidance for Local Maternity Systems).</p> <p><i>(Local trusts and health boards, primary care providers, integrated care systems, public health bodies, local government)</i></p>			NHS England (2021) <i>Equity and equality: Guidance for local maternity systems</i> ¹⁶
R10	<p>Prioritise further research in NHS maternity and perinatal care that could improve outcomes for women, and their babies, from ethnic minority groups and those in the most deprived areas. Undertaking quantitative analysis to investigate ethnic and socio-economic inequalities and report on the mediating factors and causal pathways; along with qualitative research to include exploring the experiences of people accessing maternity care.</p> <p><i>(National Institute for Health Research, UK Research and Innovation, Health and Care Research Wales and NHS Research Scotland in consultation with the Royal College of Obstetricians and Gynaecologists and policy makers, service planners/commissioners, service managers and healthcare professionals working for maternity services)</i></p>	Throughout		UK Government (2021) <i>The NHS Constitution for England</i> , ¹⁸ NHS England (2015) <i>Guidance for NHS Commissioners on Equality and Health Inequalities Legal Duties</i> ¹⁹

Introduction

Background on inequalities in pregnancy

Inequalities have been identified in all areas of health care and may be driven by a combination of elements including socio-economic factors, individual characteristics,²⁰ implicit and unconscious bias^{21,22} and structural racism.²³ Increased rates of maternal mortality and morbidity have been observed in women and birthing people and their babies from ethnic minority groups, and in those living in the most deprived areas.²⁴ It has been shown that, while Great Britain remains a safe place to give birth, maternal mortality for women from Black ethnic groups is four times higher, and two times higher for women from South Asian ethnic groups, than for white women.^{24,25,26} When it comes to babies, neonatal mortality rates for infants of Black ethnicity are 43% higher, and stillbirth rates for these groups are more than twice those for babies from white ethnic groups. For infants of South Asian ethnicity, neonatal mortality and still birth rates are 60% higher than for babies of white ethnicity.²⁷ In the UK, severe maternal morbidity is around one and a half times more likely in women from ethnic minority groups when compared with white women.²⁵ Women living in the most deprived areas are almost two and a half times more likely to die than those living in the least deprived areas, and their babies have a 73% higher risk of perinatal mortality.^{24,27}

Reducing health inequalities across society and in maternity outcomes is a key objective for UK and global policy makers,^{28–32} and never more pertinent than in the current position the world finds itself in of a COVID-19 pandemic. The direct impact of the pandemic has been reported as being disproportionately high in ethnic minority groups and in socio-economically deprived communities.^{33,34} For pregnant women and birthing people from ethnic minority groups and deprived areas, the direct impact of COVID-19 infection during pregnancy has reportedly been increased rates of hospitalisation,³⁵ and COVID-19 infection at the time of birth is associated with increased rates of preterm birth, stillbirth, pre-eclampsia/eclampsia, emergency caesarean birth and longer length of hospital admission in these groups.³⁶ Charities and campaigners, along with support from members of parliament, and a collaboration between the RCOG Race Equality Taskforce and the Five X More campaign have come together to petition for more research and a call for government recommendations to reduce inequalities and improve outcomes.^{37,38}

The World Health Organization (WHO) and The Marmot Reviews emphasise that giving every child the best start in life is crucial to reducing health inequalities across the life course, beginning before birth.^{28,29,32} The Scottish Government's Best Start strategic review, The Welsh Government's Maternity Care in Wales report and NHS England's Long Term Plan all urge for continuity of care and carer across antenatal, intrapartum and postnatal care in home, hospital and community settings. Thereby reducing hospital admissions, the need for interventions during labour, preterm births and stillbirths, and improving the woman's experience.^{5,7,12} NHS England and NHS Improvement are leading work to improve equity for mothers and babies with their guide Equity and Equality: Guidance for Local Maternity Systems asking Local Maternity Systems to co-produce Equity and Equality Action Plans by 28 February 2022.¹⁶ Interventions to tackle health inequalities also feature in NHS England's Long Term Plan, their response to the COVID-19 pandemic and 2021/22 planning guidance.^{5,39,40}

The reasons behind such health inequalities are poorly understood, with a need for more research detailing practice or addressing specific maternity interventions for ethnic minority women in the UK.^{5,16,28,29,41,42} Reporting the rates of outcomes and auditable measures in women from different ethnic and socio-economic groups will help inform how existing inequalities can be addressed.

Aims and objectives

The aim of this sprint audit was to quantify ethnic group and socio-economic inequalities in maternity and perinatal care by determining the rates of intrapartum interventions and certain maternal and perinatal outcomes for women giving birth in England, Scotland and Wales during the period 1 April 2015 to 31 March 2018, stratified by their ethnic group and their level of socio-economic deprivation by Index of Multiple Deprivation (IMD).

This report focuses on three measures of maternity care and health:

- the proportion of women who have a caesarean birth (presented as elective, emergency, and both combined)
- the proportion of women who give birth without intervention* (spontaneous onset and birth, without epidural/spinal/general anaesthesia or episiotomy)
- the proportion of women who experience a major postpartum haemorrhage (1500 ml or more) and three measures of perinatal care and health:
 - the proportion of babies with an Apgar score of less than 7 at 5 minutes
 - the proportion of babies receiving breast milk at their first feed
 - the proportion of term babies who are admitted to a neonatal unit.

The objectives were to:

- determine the distribution of ethnicity and socio-economic deprivation of women and birthing people in the NMPA dataset
- report NMPA measures for women and their babies according to the mother's recorded ethnicity and IMD quintile
- make recommendations to address inequalities and improve data quality.

*Two variations of birth without intervention are reported in the main NMPA clinical report:

- 1 spontaneous onset, progress and birth, without epidural/spinal/general anaesthesia or episiotomy
- 2 spontaneous onset and birth, without epidural/spinal/general anaesthesia or episiotomy.

Where results are shown for birth without intervention in this sprint audit report, they are shown for definition 2, as this measure captures the greatest number of women who have a birth without intervention.

Methods

Patient and public involvement

The work was supported by an advisory group that comprised professionals from obstetric, midwifery and neonatal specialties, members from the RCOG Women's Network, and women with lived experience of accessing maternity care from ethnic minority groups and from deprived areas. The group advised on which measures to include in the report, the interpretation and dissemination of the results, and the recommendations for clinical practice.

Data sources

The NMPA uses data that are routinely collected during maternity and neonatal care. Various data sources are linked together to produce a central maternity and neonatal dataset. Different data collection systems are used in each country participating in the NMPA, with some differences in the status and maturity of centralised national maternity datasets. The data sources have previously been described in the [NMPA Clinical Report on 2016/17 births](#).¹

In order to capture the most complete data for the greatest number of women, different data years were used for each devolved nation. Where data are reported at the country level, the results are shown for 1 April 2015 to 31 March 2017 for England, 1 April 2016 to 31 March 2018 for Scotland, and 1 April 2017 to 31 March 2018 for Wales. Where data obtained from the National Neonatal Research Database (NNRD) are reported, the results shown are for England and Scotland (excluding NHS Lothian) for the period 1 April 2015 to 31 March 2017.

Assessment of data quality

The NMPA has existing approaches to assess data quality and uses these to determine which trusts/health boards can be included in the report. These approaches are set out in the [NMPA Clinical Report on 2016/17 births](#)¹ and the [NMPA Measures Technical Specification](#).⁴³

The analysis in this report was restricted to records for women where both IMD and ethnicity were recorded and where neither was 'unknown' or missing. The NMPA hold records for 1 370 968 women and 1 392 099 babies for the period 1 April 2015 to 31 March 2018 in England, Scotland and Wales. In total, 129 418 women did not have either IMD or ethnicity recorded and so were excluded. The number of trusts and health boards for which results are available varied from measure to measure, depending on specific data requirements for each measure and availability of these data for each country.⁴³

Construction, stratification and reporting of measures

This report discusses six maternal and neonatal measures from among the 16 that have previously been reported in the [NMPA Clinical Report on 2016/17 births](#).¹ Results for all the measures routinely reported by the NMPA continuous clinical audit were reviewed by the NMPA team and a selection of nine measures was chosen to review with the advisory group. Six of the nine measures were included for detailed analysis in this report, chosen because they were thought to be key in displaying

outcomes of maternity care experienced by women and birthing people accessing maternity and perinatal services. This sprint audit reports on rates for the following maternal measures:

- caesarean birth (presented as elective, emergency, and both combined)
- birth without intervention
- major postpartum haemorrhage (1500 ml or more)

and perinatal measures:

- an Apgar score of less than 7 at 5 minutes
- breast milk at first feed
- neonatal unit admission at term.

Full results for all NMPA measures can be found in supplementary tables on the [NMPA website](#).

Results have been stratified by categories of ethnic group using the Office for National Statistics (ONS) 2001 census categorisation codes for ethnicity, as still used by all NHS trusts/health boards.^{2,44} These ONS 16+1 categories were collapsed into four groups: white, South Asian, Black and Other. It was necessary to group records coded as 'Mixed' and 'Chinese or other ethnic group' together creating a combined 'Other' category to increase power for comparisons. Ethnicity was considered missing if it was coded as 'Not Given' or 'Not Known'.

Socio-economic deprivation is a measured using IMD, derived from a woman's residential postcode. IMD is an overall measure of area-based deprivation calculated using information about income, education, employment, crime and the living environment in each lower-layer super output area (LSOA) in England and Wales or data zone in Scotland.³ IMD rankings of the 32 844 and 1 909 LSOAs for England³ and Wales⁴⁵ respectively (containing an average of 1500 and 1600 inhabitants in each, respectively) and the 6976 data zones (containing 700–800 inhabitants in each) for Scotland⁴⁶ were categorised according to quintiles – quintile 1 (least deprived) to quintile 5 (most deprived).

Previous NMPA clinical reports adjusted for factors including body mass index (BMI), smoking status, the presence of comorbidities including hypertension and diabetes, and obstetric history such as parity, previous caesarean birth and placental problems. These case-mix factors comprise elements of the woman's health both at booking and at birth and differ between ethnic and socio-economic groups. Adjusting for these factors can mask the full extent of inequalities and thus this report does not provide adjusted results.

Characteristics of women and their babies by ethnic group and IMD

Key findings and recommendations

- KF1** Rates of a BMI of 30 kg/m² or above and of hypertension were higher for women from Black ethnic groups when compared with women from all other ethnic groups. Rates of pre-existing diabetes were higher for women from South Asian and Black ethnic groups when compared with women from white and Other groups.
- Rates of a BMI of 30 kg/m² or above and of hypertension were higher for women in the most deprived areas when compared with those in the least deprived areas.
- KF2** Rates of smoking at birth were significantly higher in the most deprived quintile when compared with the least deprived quintile, and in women from white ethnic groups when compared with all other ethnic groups. Mothers under the age of 20 years are more likely to smoke before and during pregnancy.
- KF3** Babies born to women from South Asian and Black ethnic groups had higher rates of preterm birth before 32 weeks of gestation than babies born to white women. An increasing trend in the rates of preterm birth before 37 weeks of gestation was observed with increasing deprivation.
- KF4** Rates of a small-for-gestational-age birthweight were highest for babies born to women from South Asian ethnic groups, and were also higher for babies born to women from Black and Other ethnic groups when compared with babies born to white women.
- KF5** While overall stillbirth rates were low, rates were higher for babies born to women from South Asian and Black ethnic groups when compared with white and Other ethnic groups, and higher rates were associated with higher deprivation.
- KF11** Ethnicity data were missing for 1 in 10 women across Great Britain (1 in 5 in Scotland).
- KF12** IMD data were missing for 6% of women giving birth in Great Britain overall (6% in England, 2% in Scotland and 1% in Wales). Almost 50% of women were living in the two most deprived quintiles, and this was observed in each devolved nation.
- R1** **Target efforts for a life-course approach to improve the health of people, addressing the wider determinants of health as well as specific risk factors. Offer individualised preconception and antenatal information tailored to their circumstances, including BMI, smoking, pre-existing comorbidities (hypertension and type 2 diabetes) and whether this is their first birth or they have previously had a caesarean birth.**
- (Audience: Healthcare professionals working in maternity services, maternity services providers, general practitioners, primary care providers, public health policy makers)*
- R2** **Target efforts to reduce smoking. Audit rates of carbon monoxide testing and referrals for smoking cessation for women during pregnancy, and audit compliance with monitoring for fetal growth restriction.**
- (Audience: Healthcare professionals working in maternity services, maternity services providers, general practitioners, primary care providers, stop smoking services, public health policy makers)*

R3 Support research and investigation into why women from ethnic minority groups and more deprived areas have higher rates of stillbirth, taking into consideration differences in care, specific risk factors and the wider determinants of health

(Audience: National Institute for Health Research, Health and Care Research Wales and NHS Research Scotland in consultation with the Royal College of Obstetricians and Gynaecologists and policy makers, service planners/commissioners, service managers and healthcare professionals working for maternity services)

R8 Ethnicity should be asked of and accurately recorded for all pregnant people using agreed ethnic group coding systems that should be updated regularly in accordance with the most current census groups. Consideration should be given to methods for self-reporting of ethnicity whenever possible (see also Priority 3, intervention 1 of the Equity and Equality: Guidance for Local Maternity Systems).

(Audience: Healthcare professionals working in maternity services, maternity service providers, general practitioners, primary care providers, NHS England, NHS Scotland, NHS Wales)

R9 Review the ethnic diversity and rates of socio-economic deprivation in the local area of each NHS trust or board and consider ways to reduce inequalities in healthcare outcomes (see also Priority 4, intervention 1 of the Equity and Equality: Guidance for Local Maternity Systems).

(Audience: Local trusts and health boards, primary care providers, public health bodies, local government)

R10 Prioritise further research in NHS maternity and perinatal care that could improve outcomes for women, and their babies, from ethnic minority groups and those in the most deprived areas. Undertake quantitative analysis to investigate ethnic and socio-economic inequalities and report on the mediating factors and causal pathways; along with qualitative research to include exploring the experiences of people accessing maternity care.

(Audience: National Institute for Health Research, UK Research and Innovation, Health and Care Research Wales and NHS Research Scotland in consultation with the Royal College of Obstetricians and Gynaecologists and policy makers, service planners/commissioners, service managers and healthcare professionals working for maternity services)

The NMPA hold records for 1 370 968 women and 1 392 099 babies for the period 1 April 2015 to 31 March 2018 in Great Britain. The data years for each devolved nation are 1 April 2015 to 31 March 2017 for England, 1 April 2016 to 31 March 2018 for Scotland, and 1 April 2017 to 31 March 2018 for Wales.

Ethnic group and socio-economic distributions of women in the NMPA dataset

The proportion of women and birthing people in the NMPA dataset who gave birth between 1 April 2015 and 31 March 2018 are presented in Table 1, in Great Britain and in each devolved nation for their respective years, by ethnic group and IMD. 129 418 of the 1 370 968 records where either ethnic group, IMD or both were missing have been excluded from the audit analysis.

The highest proportion of missing data for ethnicity was in Scotland (22%), with the proportion of missing ethnicity for women in England and Wales at 8% and 10% respectively. Overall, at a Great Britain

level, ethnic group data were missing for 9% of women. It was less common for women's records to have missing information about socio-economic deprivation than ethnicity, with England, Scotland and Wales missing 6%, 2% and 1% respectively. Overall, 6% of records were missing data for IMD.

Of the three nations, England has the highest proportion of women from ethnic minority groups. Women in our dataset were slightly disproportionately resident in more deprived quintiles than the background population.⁴⁷ However, as IMD are constructed separately and slightly differently in each of the devolved nations, direct comparisons can only be made within, and not between, each nation.

Table 1 Characteristics of women who gave birth in Great Britain between 1 April 2015 and 31 March 2018 and who were included in the NMPA data, presented by country and stratified by ethnic group and IMD

Characteristic	GB 2015–18		England 2015–17		Scotland 2016–18		Wales 2017/18	
	n	%	n	%	n	%	n	%
Overall total	1 370 968		1 234 721		105 255		30 992	
Total included for analysis^a	1 241 550	100%	1 131 541	91%	82 258	7%	27 751	2%
Ethnic group^b								
White	973 622	78%	872 685	77%	76 144	93%	24 793	89%
South Asian	136 767	11%	132 967	12%	2 890	4%	910	3%
Black	58 313	5%	56 716	5%	1 203	1%	394	1%
Other (combined)	72 848	6%	69 173	6%	2 021	2%	1 654	6%
Missing (% of overall total)	129 418	(9%)	103 180	(8%)	22 997	(22%)	3 241	(10%)
IMD^c								
1 = least deprived	191 327	15%	169 101	15%	17 460	17%	4 766	16%
2	216 058	17%	192 075	17%	18 960	18%	5 023	16%
3	243 805	19%	218 945	19%	18 832	18%	6 028	20%
4	292 769	23%	264 366	23%	21 694	21%	6 709	22%
5 = most deprived	351 591	27%	317 264	27%	26 242	25%	8 085	26%
Missing (% of overall total)	75 418	(6%)	72 970	(6%)	2 067	(2%)	381	(1%)

^a Women for whom both ethnicity and IMD are recorded.

^b Ethnic group is recorded in the NMPA dataset using ONS 16+1 categories from the 2001 UK census² and subsequently collapsed into four categories.

^c The IMD quintile is derived from the recorded standardised socio-economic IMD rank of the individual's local area based on their postcode.³ As the areas used are of different granularity, the three individual countries are not directly comparable.

Characteristics of women, presented by ethnic group and IMD

The NMPA provides a unique opportunity to describe the diversity of women who gave birth during the audit period by ethnic group and IMD quintile. This section outlines the demographic and other general characteristics of these women (Tables 2 and 3).

For all ethnic groups, the greatest proportion of women were aged between 30 and 34 years. Teenage motherhood (women 19 years or younger at the time of birth) was more common among women from white ethnic groups (4%) and those in the most deprived quintile (6%); the greatest proportion of women (40 years or older) were from Black ethnic groups (8%) and the least deprived quintile (6%).

Women from Black ethnic groups had more often had a previous caesarean birth than women from all other ethnic groups. A small increase in the rate of previous caesarean birth was seen in the most deprived quintile.

Women from South Asian and Other ethnic groups had a higher rate of being classed underweight with a BMI under 18.5 kg/m², and women from Black ethnic groups had a higher rate of having a BMI of 25 kg/m² or above. The proportions of women in the healthy weight range category (with a BMI of 18.5–24.9 kg/m²) were lower in the more deprived quintiles, while the proportions of women with a

BMI of 30 kg/m² or above were higher. There was little difference observed in the proportions of women with a BMI of under 18.5 kg/m² or of 25–29.9 kg/m², with a slight increase in both in the more deprived quintiles.

Rates of pre-existing diabetes were highest for women from South Asian and Black ethnic groups (1.4% and 1.3% respectively) when compared with women from white ethnic groups (0.6%). Rates of pre-existing hypertension were similar for women from white and Other ethnic groups (0.5%), slightly higher for South Asian women (0.6%) and considerably higher for women from Black ethnic groups (1.9%). For IMD, a trend was observed for both pre-existing diabetes and hypertension with rates being lowest for women in the least deprived quintile and highest for those in the most deprived quintile.

White women had a significantly higher rate of smoking at birth (15%) than women from ethnic minority groups (South Asian 1%, Black 3%, Other 7%). An increasing trend was observed for rates of smoking at birth from least deprived (4% in quintile 1) to most deprived (21% in quintile 5).

Table 2 Characteristics of women and birthing people who gave birth in England, Scotland and Wales between 1 April 2015 and 31 March 2018^a and who were included in the NMPA data, presented by ethnic group

Characteristic	Ethnic group ^b							
	White		South Asian		Black		Other	
	n	%	n	%	n	%	n	%
Total number	973 622		136 767		58 313		72 848	
Age								
≤19	36 414	4%	959	1%	1 066	2%	2 120	3%
20–24	158 581	17%	12 938	9%	6 214	11%	9 164	13%
25–29	270 539	28%	42 496	31%	15 076	26%	19 507	27%
30–34	291 926	30%	49 204	36%	18 475	32%	23 188	32%
35–39	163 466	17%	25 170	18%	12 759	22%	14 483	20%
40+	36 842	4%	5 427	4%	4 376	8%	3 690	5%
Missing (% of total)	15 854	(1.6%)	573	(0.4%)	347	(0.6%)	696	(1.0%)
Parity								
Nulliparous	401 797	42%	46 557	34%	17 448	30%	30 379	42%
Multiparous	560 361	58%	88 979	66%	40 140	70%	41 516	58%
Missing (% of total)	11 464	(2.6%)	1 231	(2.3%)	725	(2.7%)	953	(2.6%)
Obstetric history								
Previous caesarean birth	129 193	14%	25 393	19%	13 031	23%	10 394	15%
BMI at booking (kg/m²)								
<18.5	22 098	3%	4 692	4%	819	2%	2 109	4%
18.5–24.9	387 644	47%	50 597	45%	14 211	30%	30 166	51%
25–29.9	225 104	28%	36 608	32%	16 365	35%	16 727	28%
≥30	182 332	22%	20 757	18%	15 895	34%	10 636	18%
Missing (% of total)	156 444	(16%)	24 113	(18%)	11 023	(19%)	13 210	(18%)
Pre-existing comorbidities								
Hypertension	4 436	0.5%	887	0.6%	1 109	1.9%	356	0.5%
Diabetes	6 317	0.6%	1 921	1.4%	754	1.3%	543	0.7%
Smoking								
At birth	125 391	15%	1 580	1%	1 384	3%	4 436	7%

^a 1 April 2015 to 31 March 2017 for England, 1 April 2016 to 31 March 2018 for Scotland, and 1 April 2017 to 31 March 2018 for Wales.

^b Ethnic group is recorded in the NMPA dataset using ONS 16+1 categories from the 2001 UK census² and subsequently collapsed into four categories.

Table 3 Characteristics of women and birthing people who gave birth in England, Scotland and Wales between 1 April 2015 and 31 March 2018^a and who were included in the NMPA data, presented by IMD

Characteristic	IMD ^b									
	1 = least deprived		2		3		4		5 = most deprived	
	n	%	n	%	n	%	n	%	n	%
Total number	191 327		216 058		243 805		292 769		351 591	
Age										
≤19	2 118	1%	3 960	2%	6 193	3%	10 411	4%	19 368	6%
20–24	13 663	7%	22 497	11%	32 370	14%	48 776	17%	75 113	22%
25–29	41 057	22%	54 996	26%	67 787	28%	86 792	30%	109 400	32%
30–34	72 936	38%	75 883	36%	78 602	33%	85 378	30%	88 290	26%
35–39	49 087	26%	45 286	21%	44 393	19%	44 704	16%	43 455	13%
40+	11 094	6%	10 434	5%	10 176	4%	10 607	4%	10 526	3%
Missing (% of total)	1 372 (0.7%)		3 002 (1.4%)		4 284 (1.8%)		6 101 (2.1%)		5 439 (1.5%)	
Parity										
Nulliparous	81 862	43%	96 554	45%	107 131	45%	121 994	42%	126 123	36%
Multiparous	106 654	57%	116 385	55%	133 505	55%	167 620	58%	222 570	64%
Missing (% of total)	2 811 (1.5%)		3 119 (1.4%)		3 169 (1.3%)		3 155 (1.1%)		2 898 (0.8%)	
Obstetric history										
Previous caesarean birth	26 937	14%	28 613	14%	32 153	14%	40 523	14%	53 420	16%
BMI at booking (kg/m²)										
<18.5	3 738	2%	4 442	2%	5 483	3%	7 186	3%	10 021	3%
18.5–24.9	86 997	55%	92 971	51%	99 374	48%	109 058	45%	118 505	41%
25–29.9	43 759	27%	50 554	28%	58 106	28%	70 188	29%	83 698	29%
≥30	24 770	16%	32 730	18%	42 795	21%	57 216	23%	78 540	27%
Missing (% of total)	32 063 (17%)		35 361 (16%)		38 047 (16%)		49 121 (17%)		60 827 (17%)	
Pre-existing comorbidities										
Hypertension	804	0.4%	953	0.4%	1 242	0.5%	1 709	0.6%	2 222	0.6%
Diabetes	1 057	0.6%	1 211	0.6%	1 625	0.7%	2 417	0.8%	3 423	1.0%
Smoking										
At birth	7 279	4%	13 355	7%	20 733	10%	33 669	14%	60 210	21%

^a 1 April 2015 to 31 March 2017 for England, 1 April 2016 to 31 March 2018 for Scotland, and 1 April 2017 to 31 March 2018 for Wales.

^b The IMD quintile is derived from the recorded standardised socio-economic IMD rank of the individual's local area based on their postcode.³ As the areas used are of different granularity, the three individual countries are not directly comparable.

Characteristics of the babies, presented by ethnic group and IMD of the mother

This section presents characteristics of babies at birth according to the recorded ethnic group and IMD of the mother (Tables 4 and 5).

The rate of stillbirth was highest for women from Black ethnic groups (7/1000 births) and lowest for those from white and Other ethnic groups (4/1000 births), with the rate for South Asian women being 6/1000 births. Higher stillbirth rates were associated with higher deprivation (3/1000 births in quintiles 1 and 2, 4/1000 in quintiles 3 and 4 and 5/1000 in quintile 5).

Although the numbers remain small, Black women were more than twice as likely (0.9%) to give birth to an extremely preterm baby (24–27⁺⁶ weeks of gestation) than white women (0.4%); the rates were the same for women from South Asian and Other ethnic groups (0.5%). The variation between ethnic groups for rates of preterm birth reduces as gestation increases, with the rates of giving birth to a moderate-late preterm baby (32–36⁺⁶ weeks) and a term baby (37–41⁺⁶ weeks) being similar across

ethnic groups. South Asian women had the lowest rate (1.8%) and Black women had the highest rate (2.7%) of babies born beyond 42 weeks of gestation. Rates of term birth were similar across IMD quintiles. Higher rates of all preterm birth were associated with increased deprivation. Higher rates of babies born beyond 42 weeks of gestation were associated with decreased deprivation.

The rate of babies born small for gestational age (SGA; birthweight below the 10th centile) was lowest in white women (6.9%) and highest for women from South Asian groups (14.1%); the rates for Black and Other ethnic groups were 10.4% and 8.8% respectively. Women from white ethnic groups had the highest rate (10.1%) of giving birth to a baby large for gestational age (LGA; birthweight above the 90th centile) whereas South Asian women had the lowest rate (5.1%); the rates for women from Black and Other ethnic groups were similar (7.9% and 7.5% respectively). Higher rates of a baby born SGA were associated with higher deprivation, with an increasing trend from 6.2% in quintile 1 to 9.8% in quintile 5. Lower rates of a baby born LGA were associated with lower deprivation, with a decreasing trend from 10.4% in quintile 1 to 8.3% in quintile 5.

Table 4 Characteristics of babies born in England, Scotland and Wales between 1 April 2015 and 31 March 2018^a who were included in the NMPA data, presented by their mother's ethnic group

Characteristic	Mother's ethnic group ^b							
	White		South Asian		Black		Other	
	n	%	n	%	n	%	n	%
Total number	988 875		138 447		59 393		73 928	
Fetus outcome								
Live birth	953 531	99.5%	134 930	99.4%	56 200	99.2%	69 850	99.5%
Stillbirth	3 384	0.4%	747	0.6%	413	0.7%	302	0.4%
Other ^c	1 528	0.2%	76	0.1%	37	0.1%	46	0.1%
Missing (% of total)	30 432	(3%)	2 694	(2%)	2 743	(5%)	3 730	(5%)
Gestational age at birth								
20–23 ⁺⁶ weeks	655	0.1%	117	0.1%	104	0.2%	78	0.1%
24–27 ⁺⁶ weeks	3 788	0.4%	617	0.5%	501	0.9%	326	0.5%
28–31 ⁺⁶ weeks	8 085	0.8%	1 260	0.9%	729	1.3%	569	0.8%
32–36 ⁺⁶ weeks	65 147	6.7%	9 165	6.8%	3 925	6.7%	4 439	6.1%
37–41 ⁺⁶ weeks	866 188	89.4%	121 926	90.0%	51 485	88.3%	65 331	90.2%
42+ weeks	24 765	2.6%	2 403	1.8%	1 574	2.7%	1 670	2.3%
Missing (% of total)	20 247	(2.0%)	2 959	(2.1%)	1 075	(1.8%)	1 515	(2.0%)
Birthweight centile								
SGA	66 750	6.9%	18 973	14.1%	6 030	10.4%	6 329	8.8%
AGA	799 422	83.0%	108 881	80.8%	47 287	81.7%	60 286	83.7%
LGA	97 545	10.1%	6 854	5.1%	4 591	7.9%	5 405	7.5%
Missing (% of total)	25 158	(2.5%)	3 739	(2.7%)	1 485	(2.5%)	1 908	(2.6%)

^a 1 April 2015 to 31 March 2017 for England, 1 April 2016 to 31 March 2018 for Scotland, and 1 April 2017 to 31 March 2018 for Wales.

^b Ethnic group is recorded in the NMPA dataset using ONS 16+1 categories from the 2001 UK census² and subsequently collapsed into four categories.

^c Includes late miscarriages (including of second twin), and terminations of pregnancy.

Abbreviations: SGA = small for gestational age (birthweight below the 10th centile), AGA = appropriate for gestational age, LGA = large for gestational age (birthweight above the 90th centile).

Table 5 Characteristics of babies born in England, Scotland and Wales between 1 April 2015 and 31 March 2018^a who were included in the NMPA data, presented by their mother's IMD

Characteristic	Mother's IMD ^b									
	1 = least deprived		2		3		4		5 = most deprived	
	n	%	n	%	n	%	n	%	n	%
Total number	194 719		219 569		247 720		297 092		356 406	
Fetus outcome										
Live birth	188 022	99.6%	210 231	99.5%	237 516	99.5%	284 741	99.4%	345 100	99.4%
Stillbirth	556	0.3%	657	0.3%	871	0.4%	1 139	0.4%	1 686	0.5%
Other ^c	110	0.1%	323	0.2%	402	0.2%	554	0.2%	293	0.1%
Missing (% of total)	6 031	(3.1%)	8 358	(3.8%)	8 931	(3.6%)	10 658	(3.6%)	9 327	(2.6%)
Gestational age at birth										
20–23 ⁺⁶ weeks	111	0.1%	124	0.1%	156	0.1%	236	0.1%	339	0.1%
24–27 ⁺⁶ weeks	583	0.3%	752	0.4%	959	0.4%	1 297	0.4%	1 864	0.5%
28–31 ⁺⁶ weeks	1 330	0.7%	1 541	0.7%	1 962	0.8%	2 592	0.9%	3 629	1.0%
32–36 ⁺⁶ weeks	11 164	5.9%	13 102	6.1%	15 316	6.3%	19 666	6.8%	26 364	7.5%
37–41 ⁺⁶ weeks	170 895	90.3%	192 245	90.0%	216 787	89.8%	260 234	89.4%	312 191	88.6%
42+ weeks	5 152	2.7%	5 744	2.7%	6 331	2.6%	7 117	2.4%	7 854	2.2%
Missing (% of total)	5 484	(2.8%)	6 061	(2.8%)	6 209	(2.5%)	5 950	(2.0%)	4 165	(1.2%)
Birthweight centile										
SGA	11 631	6.2%	14 067	6.6%	17 400	7.2%	24 470	8.5%	34 422	9.8%
AGA	157 249	83.4%	177 239	83.4%	199 485	83.0%	239 042	82.6%	286 648	81.9%
LGA	19 557	10.4%	21 231	10.0%	23 370	9.7%	25 910	9.0%	28 988	8.3%
Missing (% of total)	6 282	(3.2%)	7 032	(3.2%)	7 465	(3.0%)	7 670	(2.6%)	6 348	(1.8%)

^a 1 April 2015 to 31 March 2017 for England, 1 April 2016 to 31 March 2018 for Scotland, and 1 April 2017 to 31 March 2018 for Wales.

^b The IMD quintile is derived from the recorded standardised socio-economic IMD rank of the individual's local area based on their postcode.³ As the areas used are of different granularity, the three individual countries are not directly comparable.

^c Includes late miscarriages (including of second twin), and terminations of pregnancy.

Abbreviations: SGA = small for gestational age (birthweight below the 10th centile), AGA = appropriate for gestational age, LGA = large for gestational age (birthweight above the 90th centile).

Measures of care and outcomes

Key findings and recommendations

- KF6** Women from Black ethnic groups had higher rates of birth without intervention and of caesarean birth (elective, emergency, and both combined) when compared with white women.
- KF7** Women from Black ethnic groups had a higher rate of major postpartum haemorrhage (1500 ml or more). A decreasing trend for major postpartum haemorrhage was observed from the least to most deprived quintiles.
- KF8** When compared with babies born to white women, babies born to South Asian women had a lower rate of an Apgar score of less than 7 at 5 minutes, but their rate of term neonatal unit admission was higher; babies born to Black women had higher rates of both an Apgar score of less than 7 at 5 minutes and term neonatal unit admission when compared with babies born to white women.
- KF9** Increasing trends from least to most deprived quintiles were observed for rates of babies being assessed as having an Apgar score of less than 7 at 5 minutes and for rates of term admission to a neonatal unit.
- KF10** Rates of receiving breast milk at the first feed were lowest for babies born to women from white ethnic groups and those from the most deprived areas. Teenage mothers (less than 20 years of age) are less likely to initiate breastfeeding. The UK sees a significant drop-off in breastfeeding rates by 3 months after birth.
- R4** **Improve availability and quality of information about choices during pregnancy and labour, with particular attention to the development of evidence-based shared decision-making tools for place, mode and timing of birth, and pain relief options. Consider using the IDECIDE tool (when available).**
(Audience: Healthcare professionals working in maternity services, maternity services providers, NHS England, NHS Scotland, NHS Wales)
- R5** **Avoid term admission to a neonatal unit through improving transitional care provision, by establishing facilities where they are not currently available; or in hospitals that do have transitional care facilities, by expanding cot space availability and increasing numbers of appropriately trained staff.**
(Audience: Maternity and neonatal services providers)
- R6** **Offer all women breastfeeding information and support, and target support in specific areas where breastfeeding rates are lowest (see also Priority 4c, intervention 3 of the Equity and Equality Guidance for Local Maternity Systems).**
(Audience: Healthcare professionals working in maternity services, health visitors, primary care providers, maternity care services)
- R7** **Review equality and diversity training provision and update to include the risks associated with deprivation, and how to recognise and avoid unconscious bias (see also Priority 4d, intervention 1 of the Equity and Equality: Guidance for Local Maternity Systems).**
(Audience: Local trusts and health boards, medical Royal Colleges, Royal Colleges of Nursing and Midwifery, General Medical Council, Nursing and Midwifery Council, Health and Care Professions Council, higher education institutions)

This chapter is separated into maternal measures and perinatal measures.

The definitions of the measures included remain unchanged from previous reports. In consultation with both professional and service user representatives in the advisory group for this sprint audit, the measures deemed to be a priority for highlighting the key inequalities for this report were included from the broader selection of NMPA measures. The number of women for whom the measure is relevant, and for whom the outcome occurs, has been stratified by ethnic group and IMD to enable comparison across the various categories. The measures are reported using bar charts, with 95% confidence intervals (CI) for each point estimate.

Findings

The findings are presented graphically in this section of the report on a Great Britain level. Full results, including numerators, denominators and rates (with 95% CI), are available in Appendices 1–4, for Great Britain level results as well as for country level results.

Maternal measures

Caesarean birth: Of women who give birth to a singleton baby between 37⁺⁰ and 42⁺⁶ weeks of gestation, the proportion who have a caesarean birth, both elective and emergency combined (Figures 1a and 2a).

Elective caesarean birth: Of women who give birth to a singleton baby between 37⁺⁰ and 42⁺⁶ weeks of gestation, the proportion who have a planned caesarean birth (Figures 1b and 2b).

Emergency caesarean birth: Of women who give birth to a singleton baby between 37⁺⁰ and 42⁺⁶ weeks of gestation, the proportion who have an emergency caesarean birth (Figures 1c and 2c).

Birth without intervention: Of women who give birth to a singleton baby between 37⁺⁰ and 42⁺⁶ weeks of gestation, the proportion who give birth without intervention* (Figures 1d and 2d).

Postpartum haemorrhage: Of women who give birth to a singleton baby between 37⁺⁰ and 42⁺⁶ weeks of gestation, the proportion who have a major postpartum haemorrhage of 1500 ml or more† (Figures 1e and 2e).

Perinatal measures

Breast milk at first feed: Of liveborn, singleton babies born between 34⁺⁰ and 42⁺⁶ weeks of gestation, the proportion who receive any breast milk for their first feed (Figures 3a and 4a).

An Apgar score of less than 7 at 5 minutes: Of liveborn, singleton babies born between 37⁺⁰ and 42⁺⁶ weeks of gestation, the proportion who are assessed as having an Apgar score of less than 7 at 5 minutes of age (Figure 3b, 4b).

Neonatal unit admission at term: Of liveborn, singleton babies born between 37⁺⁰ and 42⁺⁶ weeks of gestation, the proportion who are admitted to a neonatal unit‡ (Figures 3c and 4c).

* Two variations of birth without intervention are reported in the main NMPA clinical report:

- 1 spontaneous onset, progress and birth, without epidural/spinal/general anaesthesia or episiotomy
- 2 spontaneous onset and birth, without epidural/spinal/general anaesthesia or episiotomy.

Where results are shown for birth without intervention in this sprint audit report, they are shown for definition 2, as this measure captures the greatest number of women who have a birth without intervention.

† In the Scottish data sources, information on postpartum haemorrhage is only available using a threshold of 500 ml, and therefore Scottish data are not included in the results for this measure.

‡ Admission to a neonatal unit for babies at term can only be presented for those born in England and Scotland (excluding NHS Lothian) for the period 2015–17, for whom linkage with NNRD was possible.⁴⁷

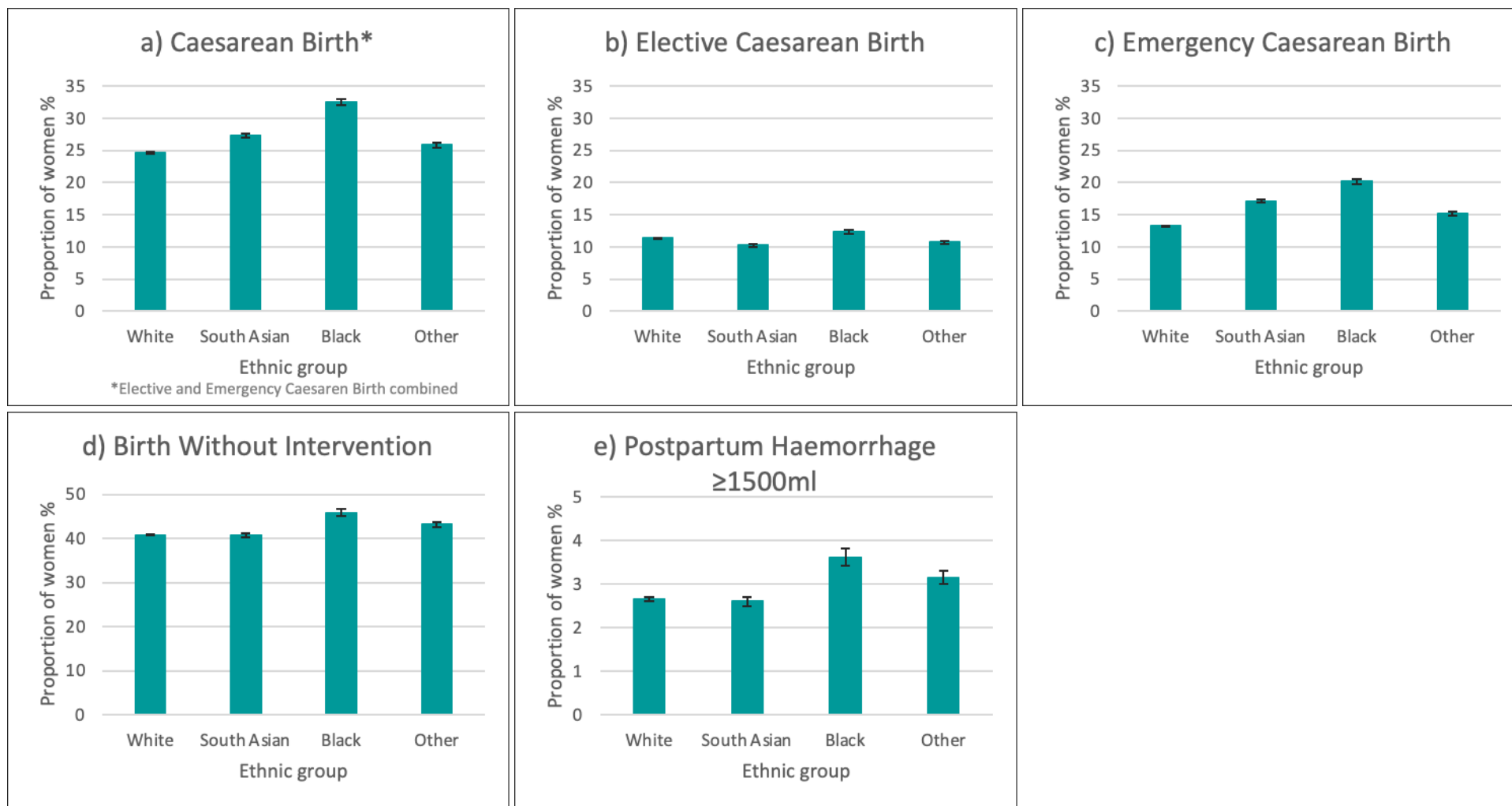


Figure 1 Graphs showing the proportion of affected women for each maternal measure, stratified by ethnic group

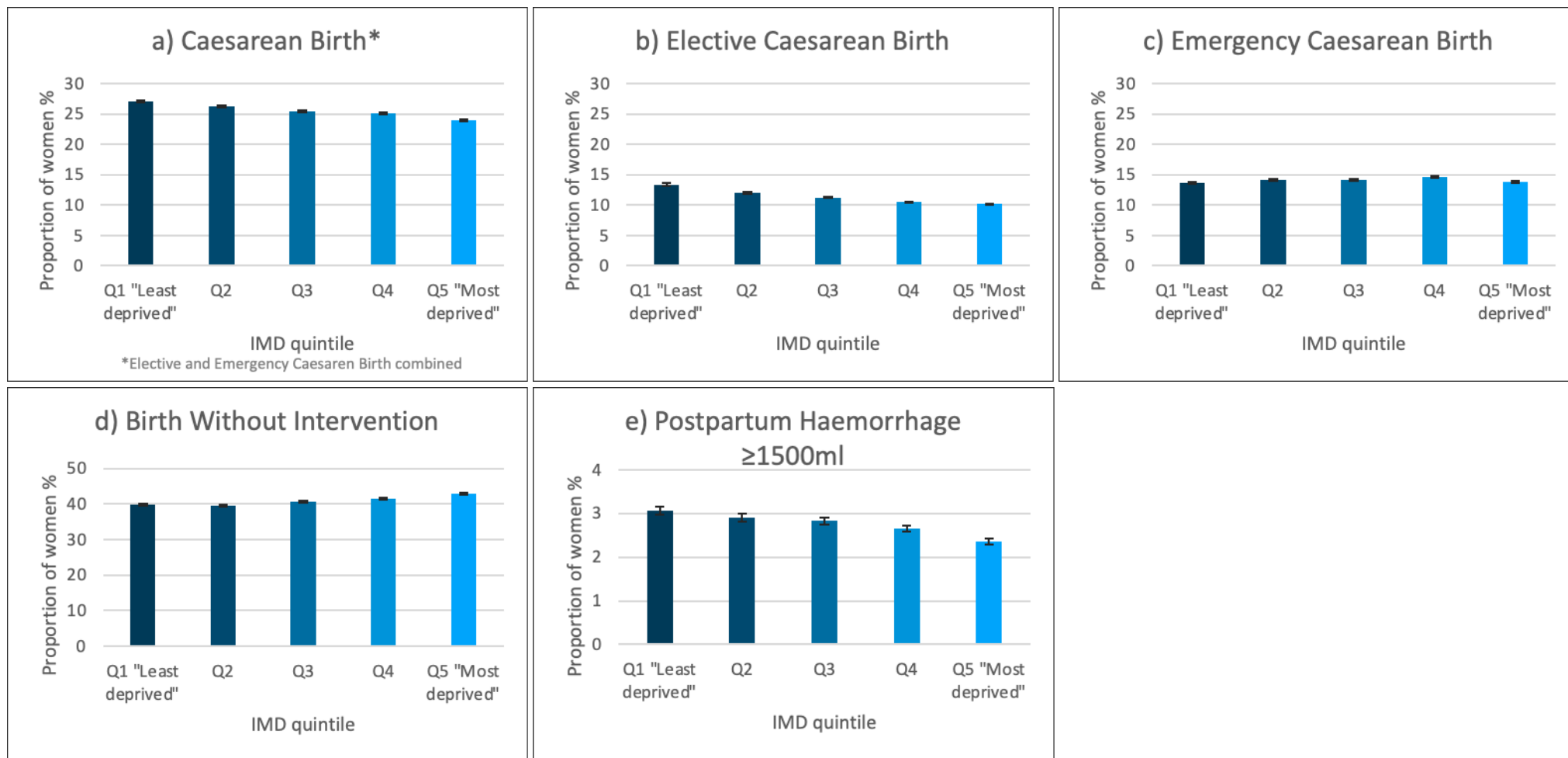


Figure 2 Graphs showing the proportion of affected women for each maternal measure, stratified by IMD quintile

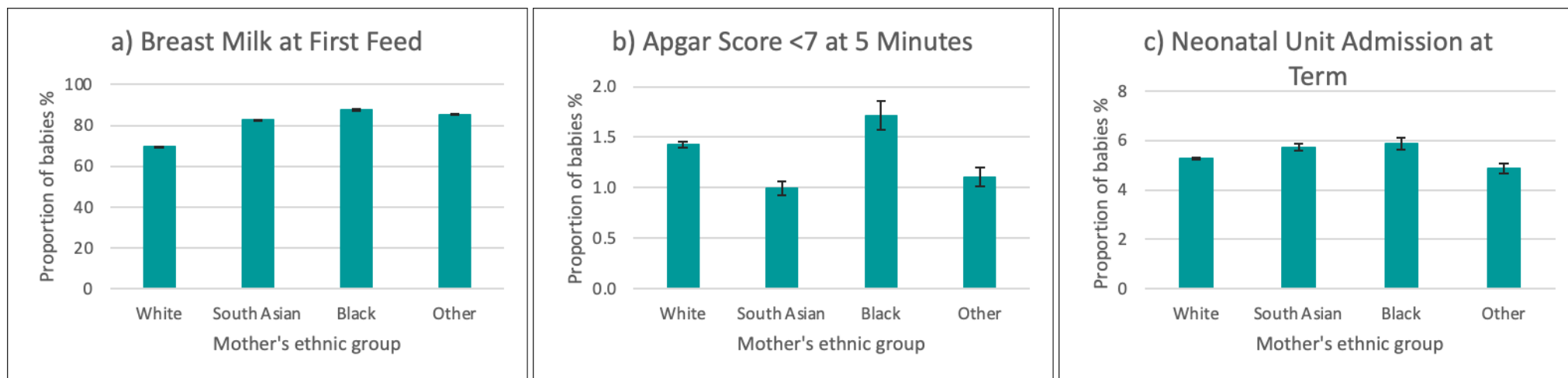


Figure 3 Graphs showing the proportion of affected babies for each perinatal measure, stratified by the mother's ethnic group

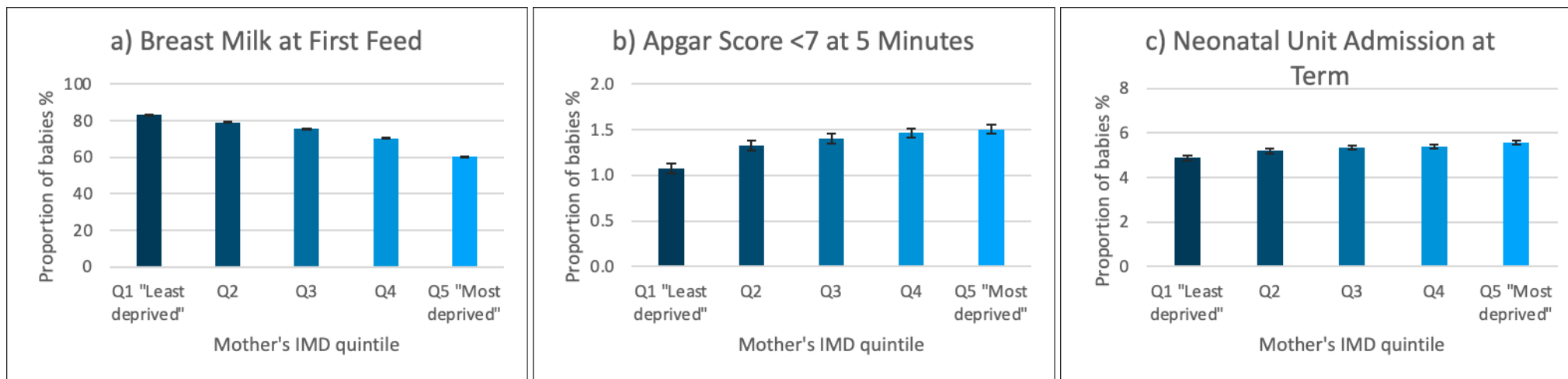


Figure 4 Graphs showing the proportion of affected babies for each perinatal measure, stratified by the mother's IMD quintile

Summary of findings

Our results demonstrate differences in outcomes of maternity and perinatal care among women and birthing people, and their babies, via comparisons between those living in the most deprived and the least deprived areas in Great Britain, and those from ethnic minority groups versus white ethnic groups. This section presents the crude results in our data; therefore, these differences are descriptive and are not taking into account interactions between contributory factors that may affect the results but the complexities of which are not easily interpreted.

Women from South Asian and Black ethnic groups had higher rates of caesarean birth (elective and emergency combined) than women from white and Other ethnic groups. For Black women, this difference in rates was more apparent in emergency caesarean birth than elective caesarean birth; South Asian women had a lower rate of elective caesarean birth but a higher rate of emergency caesarean birth when compared with white women. While emergency caesarean birth rates were similar across deprivation groups, a decreasing trend for rates of elective caesarean birth was observed from least to most deprived.

Women and birthing people from Black ethnic groups had a higher rate of experiencing a birth without intervention when compared with those from white or South Asian ethnic groups, for whom the rate was the same. There was a slight increase in rates of birth without intervention in the two most deprived IMD quintiles.

The rates of major postpartum haemorrhage of 1500ml or more were higher for those from Black and Other ethnic groups when compared with those from white or South Asian ethnic groups, for whom the rate was the same. A decreasing trend for major postpartum haemorrhage was seen from the least to most deprived quintiles.

The rate of receiving breast milk at their first feed was lowest for babies born to white women when compared with babies born to women from ethnic minority groups. There was a strong association between lower rates of rates of breast milk at first feed and increasing deprivation.

When compared with babies born to white women, babies born to South Asian women had a lower rate of an Apgar score of less than 7 at 5 minutes, but their rate of term neonatal unit admission was higher; babies born to Black women had higher rates of both an Apgar score of less than 7 at 5 minutes and term neonatal unit admission when compared with babies born to white women. Increasing trends from the least to most deprived quintiles were observed for babies being assessed as having an Apgar score of less than 7 at 5 minutes and for admission to a neonatal unit when born at term.

Interpretation

This chapter provides an interpretation of the findings, based on available literature, the clinical expertise of the NMPA and the knowledge and experience of the advisory group. Some of the group's opinions have been included as quotations.

Our results show that Black women had higher rates of caesarean birth, elective and emergency (and both combined), were more likely to experience a major postpartum haemorrhage of 1500 ml or more, and their babies were more likely to be assessed as having an Apgar score of less than 7 at 5 minutes and/or were more likely to be admitted to neonatal care when compared to women from all other ethnic groups. The pathways that lead to these complications may be mitigated by anticipatory measures, such as prophylactic care for postpartum haemorrhage or earlier delivery for a baby monitored appropriately to detect signs of distress. For women from South Asian and Other ethnic groups, the picture is more nuanced. Women from South Asian ethnic groups had a higher rate of emergency caesarean birth when compared with white women but were no more likely to have a birth without intervention. They had similar rates of major postpartum haemorrhage of 1500 ml or more and lower rates of their babies being assessed as having an Apgar score of less than 7 at 5 minutes, when compared with women from white ethnic groups.

Women from Black ethnic groups had higher rates of caesarean birth (elective, emergency, and both combined) than those from all other ethnic groups. Factors that increase the chance of having a caesarean birth are BMI of 30 kg/m² or above,⁴⁹ higher maternal age and having had a previous caesarean birth.⁵⁰ In our data, Black women had higher rates of having a BMI of 30 kg/m² or above, of giving birth aged 35 years and over and of having had a previous caesarean birth than those from all other ethnic groups. We do not have details of the reasons for an elective caesarean (maternal choice or medical indication) or the level of concern of maternal compromise or signs of fetal distress indicating the category of emergency caesarean.⁵¹ A recent meta-analysis found significantly decreased odds of caesarean birth in the most deprived quintile,⁵² and our data show an overall reducing rate of caesarean birth (elective and emergency combined) from the least deprived to most deprived quintiles. Rates of caesarean birth when stratified by ethnic group and IMD have remained largely unchanged for more than 10 years.⁵³

Black women had a higher rate of major postpartum haemorrhage of 1500 ml or more when compared with women from all other ethnic groups. Characteristics and factors that increase the chance of experiencing a major postpartum haemorrhage are previous caesarean birth,⁵³ caesarean birth in the current pregnancy,⁵⁴ increased maternal age, hypertension and BMI of 35 kg/m² or above.^{55,56} Our results show that women from Black ethnic groups had higher rates of hypertension, increased maternal age, BMI of 35 kg/m² or above, previous caesarean birth and of having a caesarean birth in the current pregnancy. In contrast with the usual association of increased deprivation with increased adverse outcomes, our results show a decreasing trend for rates of major postpartum haemorrhage of 1500 ml or more as deprivation increases. We found higher rates of hypertension and of having had a previous caesarean birth in the more deprived quintiles, and the rate of having a BMI of 30 kg/m² or above increased as deprivation increases. However, our results showed lower rates of caesarean birth in the current pregnancy and that the rate of women giving birth over the age of 30 years decreased from the least to the most deprived quintiles. Obstetric haemorrhage (encompassing antepartum and postpartum haemorrhage) is a common reason for maternal intensive care admission. Intensive care admission has also been identified as being more common in women over the age of 35 years, in women from Black ethnic groups and in women from the most deprived areas.⁵⁷

When compared with women and birthing people from all other ethnic groups, our results show that those from Black ethnic groups had higher rates of experiencing a birth without any intervention at all. While this is desirable when appropriate, it may also be a reflection of care that is generally ‘too little, too late’.⁵⁸ There was a slight increase in rates of birth without intervention for women and birthing people in the most deprived areas. It may be that when a birth without intervention is desirable and has good outcomes, it will be considered a good experience. However, sometimes interventions, such as episiotomy, induction of labour or pain relief, are necessary or requested by women and should be undertaken with informed decision making and information sharing between the woman and her clinicians. A national survey of women in England in 2006–07 found that women from all ethnic minority groups except Mixed were less likely than white women to say that they had received adequate pain relief during labour/birth, had complete confidence and trust in staff, and were never left alone by doctors/midwives when worried.⁵⁹ A 2010 English national survey report highlighted that, as the level of deprivation increased, women and birthing people were less likely to say that they had received antenatal care, felt respected by staff or were spoken to in a way that they could understand.⁶⁰ A survey published in 2013 of women from ethnic minority groups about their experiences of maternity services in England found that women reported feelings of not being believed that they were in labour or about the amount of pain they were experiencing, not being involved in decision making, having their choices denied, and that their cultural or religious needs were disregarded.⁶¹

“... if the results are saying that they’re having birth without intervention, it might not be because they don’t want the intervention – they might want the pain relief but by the time they get in... if it’s that late, you know they’re probably being told they can’t have pain relief, it’s too late to have the epidural, etc., so that might explain it.”
(Shaista Gohir, NMPA advisory group member)

While there has been an overall decline in stillbirth and neonatal death rates over time, rates remain higher for those from Black and South Asian ethnic groups and in the most deprived quintile.²⁷ Our results show stillbirth rates were highest for women from Black ethnic groups. A systematic review and meta-analysis of studies from high-income countries and a Great Britain national cohort study found an excess of stillbirth, preterm birth and fetal growth restriction influenced by ethnicity, BMI and maternal smoking.^{62,63} Smoking is the single biggest modifiable risk factor for poor birth outcomes.⁶⁴ Women from the most deprived communities are 12 times more likely to smoke during pregnancy than those from less deprived areas.⁵ Smoking in pregnancy not only increases the risks of stillbirth but also of miscarriage, preterm birth, low birthweight, heart defects and sudden infant death.⁵ Women under the age of 20 years are twice as likely to smoke before and during pregnancy, compared with mothers of all ages. They are also a third less likely to start breastfeeding, compared with mothers aged 20 years and over. Babies of teenage mothers have a 30% higher rate of stillbirth and a 30% higher rate of low birthweight compared with babies of mothers of all ages.⁶⁵ This sprint audit reports on data for births in Great Britain between 1 April 2015 and 31 March 2018, and it is therefore probably too soon to determine the impact of recommendations to reduce smoking in pregnancy and fetal growth surveillance as set out in NHS England’s Saving Babies Lives Care Bundle (SBLCB).¹⁰ An evaluation of the SBLCB early adopter NHS trusts found that 18 of the 19 trusts included were offering routine carbon monoxide testing most or all of the time but that referral for smoking cessation was more variable.⁶⁶

Separating mothers and babies because of neonatal unit admission at term should be avoided wherever possible.¹³ This can be enabled through the provision of transitional care settings,^{*} which provide simple therapy such as support with feeding, thermoregulation, phototherapy for neonatal jaundice, and certain intravenous antibiotics for suspected or confirmed infection. A study of term neonatal unit admissions in England found that the most common reason was respiratory distress.⁶⁷ Factors known to increase the chance of respiratory distress at term are caesarean birth, maternal age over 32 years and gestational diabetes.⁶⁸ Maternal diabetes and beta-blockers given for maternal hypertension increase the risk of neonatal hypoglycaemia.⁶⁹ Babies who require intravenous fluids to manage their hypoglycaemia or additional help with their feeding such as nasogastric tube (NGT) feeding, in settings where neonatal transitional care is not available or unable to facilitate NGT feeding, will need to be admitted to a neonatal unit.⁷⁰ Having low birthweight, being male, being born at 37 weeks of gestation (rather than at 38 weeks or later) and South Asian ethnicity are all associated with higher rates of neonatal unit admission for jaundice.⁶⁷ Our results show higher rates of SGA babies born to women and birthing people from South Asian and Black ethnic groups and an increasing trend from least deprived to most deprived IMD quintiles.

When compared with babies born to white women, babies born to mothers from all ethnic minority groups had higher rates of receiving breast milk at their first feed, and rates decreased with increasing deprivation. From national surveys, babies who are least likely to be breastfed are those from more deprived areas, from white ethnic groups and born to parents who were formula fed themselves, and so the pattern perpetuates through the generations, contributing to health inequalities.⁷¹ The UK has some of the lowest breastfeeding rates in the world. Unicef introduced their Baby Friendly Initiative to support health professionals in enabling families to make informed decisions about infant feeding.¹⁷ Maternity units not already holding Unicef Baby Friendly accreditation were due to start the process in 2019/20.⁵ The NMPA holds data on breast milk at first feed and at discharge but cannot report on the longer term duration of breastfeeding. A UK study found that rates of initiation of breastfeeding were higher for all other ethnic groups when compared with women from white ethnic groups, and for those in the least deprived areas when compared with women in the most deprived areas.⁷² However, the study reported a significant drop-off in exclusive breastfeeding rates at 3 months, an observation seen universally across all ethnic groups and all IMD quintiles.

A study exploring the experiences of midwives providing care for women from ethnic minority groups in one region of England identified a need for training/education of cultural diversity to better understand the traditions and needs of women in their care.⁷³

“All babies come out the same, ultimately. It shouldn’t be based on your socio-economic status or your postcode as to what care you have. Shouldn’t they all be afforded the best start?” (Brooklynn Masters, NMPA advisory group member)

The 2014 annual report by the Chief Medical Officer for England highlighted the need to improve preconception health, with particular attention to be paid to non-communicable diseases related to obesity, cardiovascular health and type 2 diabetes.⁶⁴ A pregnant woman’s BMI is measured at her booking appointment; this appointment should have occurred by 10 weeks of gestation but often occurs later for women from ethnic minority groups.⁷⁴ Adverse maternal and perinatal outcomes increase as maternal BMI increases,⁵⁰ yet no pregnancy-specific BMI criteria exist to define

^{*} Usually on a postnatal ward or dedicated area, transitional care supports resident mothers as primary care providers for their babies with care requirements in excess of normal newborn care, but who do not require to be in a neonatal unit.

thresholds or to inform risk stratification. Likewise, ethnicity-specific BMI charts are not widely used, resulting in underestimation of obesity and over-reporting of being classified as underweight among South Asian populations.⁷⁵

Concerns have been raised about the completeness and quality of ethnicity data recording in healthcare datasets. In a recent research report published by the Nuffield Trust, which reported on England only, they found incomplete coding and inconsistent use of ethnic group codes.⁷⁶ Our data show ethnicity was missing for around 1 in 10 women across Great Britain (closer to 1 in 5 for women in Scotland), this may mean in reality the differences in the results we present here between ethnic groups (and IMD quintiles) could be higher or lower. The Nuffield Trust report also found inconsistencies in ethnic group reporting for individuals across different healthcare datasets, with people from ethnic minority groups disproportionately affected. When deprivation is taken into consideration, the report highlights that people living in the least deprived areas were least likely to have a valid ethnicity code, that is one that is other than 'not known' or 'not stated', in contrast with an increase in ethnicity recorded as 'Other' in more deprived areas.⁷⁶ Ethnicity is confounded by deprivation with people from all ethnic minority groups more likely than people from white ethnic groups to live in deprived areas.^{48,77} Discordance between ethnicity recording has been observed between the English national hospital datasets Hospital Episode Statistics and Maternity Information Systems.⁷⁸ Inconsistent or missing data is of particular concern when targeting ethnicity- and sociodemographic-specific healthcare interventions.^{78,79} Not surprisingly, ethnicity was more accurately recorded when self-reported, compared with hospital recording of ethnicity in healthcare records. While it was not conducted in a maternity setting, a survey of English cancer patients found the accuracy of hospital-recorded ethnicity reduced as deprivation increased. Records were most accurate for patients who described themselves as 'White British', while significant discordance was observed for all other ethnic groups.⁸⁰ This suggests that consideration of the quality of data relating to ethnicity and socio-economic deprivation should not be limited to maternity care but is potentially problematic in broader areas of health care. Aggregating ethnic groups may mask differences in outcomes between the constituent groups. Using the most detailed ethnic groups as possible is preferred; however, aggregate groups are often necessary for sample size reasons.⁸¹

Women are increasingly entering pregnancy with pre-existing comorbidities, with rising rates of obesity, hypertension and type 2 diabetes, all of which are associated with adverse outcomes. The NHS in the UK targets the health of women across the life course, aiding and encouraging them to improve their health prior to becoming pregnant and in turn improve their maternity outcomes.

“I think these discussions have been really, really insightful and productive in trying to make sense of [the findings] so then there is a bit of sun breaking through the clouds in terms of what recommendations can be made, and what discussions need to be had between both providers and service users, as to how can we begin to bridge this gap . . . and have conversations to improve the perinatal experience and ultimately improve these statistics so that they're not as bad.” (Jacqueline Parkes, NMPA advisory group member)

Conclusion

This report highlights the widespread disparities in outcomes experienced across maternal and perinatal care by women from ethnic minority groups and those living in deprived areas. While differences in clinical practice are relatively small and may be appropriate in response to different risks identified for women from ethnic minority or deprived groups, this is unlikely to explain the difference in outcomes we observe in this report. Ethnic and socio-economic inequalities in health care are not limited to maternity care or indeed health care in the UK but are reported worldwide and are further exacerbated by the current COVID-19 pandemic. The need to reduce healthcare inequalities has been recognised by policy makers on a national and international level and emphasised in key reports from the WHO and The Marmot Review.^{28,29,32} We hope that this report will add to the growing body of evidence of inequalities in health care and will help to drive healthcare providers, policy makers, politicians, clinicians and patients in demanding change to improve equality within society.

While this report has identified the state of disparity of outcomes in maternity services in the UK, our data are unable to confirm causal mechanisms. It is hoped that this report will be used by maternity service providers to audit and reflect upon their local results, and by researchers to identify research priorities and develop research questions to address the fundamental drivers of inequalities in maternity care and maternal/perinatal outcomes and to further explore the experiences of the women who access maternity services. Healthcare and lifestyle interventions extend beyond the remit of maternity care to ensure women and birthing people are healthy before they enter pregnancy.

This report emphasises the need for better data collection surrounding ethnicity in order to identify those at highest risk of adverse maternal and perinatal outcomes. There remains room for improvement in the quality and completeness of data collection in general across healthcare settings.

The NMPA believes that the first step in addressing disparity in outcomes for women from deprived or ethnic minority groups is for clinicians, maternity service providers, healthcare commissioners and policy makers to acknowledge and take ownership of these inequalities within our healthcare system. Women from these groups should be made aware of their increased risk of adverse outcomes and offered information to support choices that are individual and appropriate to them. It is hoped that doing this may empower women and birthing people to form stronger relationships with their healthcare providers, not just for their own pregnancy, but so that they can also be more involved in shaping services for their community and future generations.

A mother's health before and during her pregnancy, or adverse events around the time of birth, may influence a baby's future health and development. By shining a spotlight on the disparities faced by women receiving maternity care today, it is hoped that equality in care can be improved for those who will seek our help tomorrow.

“The broader benefit is that if we can fix these inequalities then you fix it for everyone [. . .] because you’re talking about raising standards of care generally. People in the lower socio-economic demographic or people of colour who are more likely in society to be subject to discrimination – if you can raise the standards for them then that can be beneficial for everyone. Ultimately, it’s about improving the status quo for everyone who accesses maternity care.” (Jacqueline Parkes, NMPA advisory group member)

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Appendix 1 Results for Great Britain

Table 6 Results for Great Britain stratified by ethnic group

Measure	Ethnic group ^a			
	White	South Asian	Black	Other
Postpartum haemorrhage ≥1500 ml				
Numerator/denominator (n)	17 597/662 974	2 377/91 843	1 324/36 514	1 513/48 103
Crude rate [95% CI] (%)	2.65 [2.61–2.69]	2.60 [2.49–2.70]	3.61 [3.42–3.81]	3.15 [2.99–3.30]
Caesarean birth (any)				
Numerator/denominator (n)	203 460/822 803	30 481/112 405	14 476/44 930	14 987/58 374
Crude rate [95% CI] (%)	24.6 [24.6–24.7]	27.3 [27.1–27.6]	32.5 [32.1–33.0]	25.9 [25.5–26.2]
Elective caesarean birth				
Numerator/denominator (n)	93 862/822 803	11 286/112 405	5 379/44 930	6 178/58 374
Crude rate [95% CI] (%)	11.4 [11.3–11.4]	10.2 [10.0–10.4]	12.3 [12.0–12.6]	10.7 [10.5–11.0]
Emergency caesarean birth				
Numerator/denominator (n)	109 598/822 803	19 195/112 405	9 097/44 930	8 809/58 374
Crude rate [95% CI] (%)	13.3 [13.2–13.4]	17.1 [16.9–17.4]	20.2 [19.8–20.6]	15.1 [14.8–15.4]
Birth without intervention				
Numerator/denominator (n)	189 037/465 171	21 982/53 030	9 257/19 838	12 879/29 424
Crude rate [95% CI] (%)	40.8 [40.7–40.9]	40.8 [40.3–41.2]	45.9 [45.2–46.7]	43.2 [42.7–43.8]
Apgar score <7 at 5 minutes				
Numerator/denominator (n)	10 617/743 257	913/92 904	629/36 967	566/50 587
Crude rate [95% CI] (%)	1.43 [1.40–1.46]	0.99 [0.92–1.06]	1.71 [1.57–1.85]	1.11 [1.01–1.20]
Breast milk at first feed				
Numerator/denominator (n)	440 976/634 130	63 654/77 243	27 643/31 603	35 323/41 505
Crude rate [95% CI] (%)	69.6 [69.5–69.7]	82.6 [82.3–82.9]	87.5 [87.1–87.9]	85.3 [84.9–85.6]
Neonatal unit admission at term				
Numerator/denominator (n)	38 539/729 154	5 768/101 423	2 428/41 244	2 511/51 632
Crude rate [95% CI] (%)	5.28 [5.22–5.33]	5.73 [5.57–5.88]	5.88 [5.64–6.11]	4.86 [4.67–5.05]

^a Ethnic group is recorded in the NMPA dataset using ONS 16+1 categories from 2001 UK census² and subsequently collapsed into four categories.

Table 7 Results for Great Britain stratified by IMD

Measure	IMD ^b				
	1 = least deprived	2	3	4	5 = most deprived
Postpartum haemorrhage ≥1500 ml					
Numerator/denominator (n)	3 929/128 293	4 102/141 439	4 526/159 892	5 082/190 948	5 172/218 862
Crude rate [95% CI] (%)	3.06 [2.97–3.15]	2.90 [2.82–2.99]	2.83 [2.75–2.91]	2.66 [2.59–2.73]	2.36 [2.30–2.43]
Caesarean birth (any)					
Numerator/denominator (n)	41 819/154 008	45 507/172 831	49 401/193 878	58 350/232 649	68 327/285 146
Crude rate [95% CI] (%)	27.1 [26.9–27.3]	26.3 [26.1–26.5]	25.5 [25.3–25.7]	25.1 [24.9–25.3]	24.0 [23.8–24.2]
Elective caesarean birth					
Numerator/denominator (n)	20 751/154 008	20 898/172 831	21 837/193 878	24 358/232 649	28 861/285 146
Crude rate [95% CI] (%)	13.4 [13.2–13.6]	12.1 [11.9–12.2]	11.3 [11.1–11.4]	10.5 [10.4–10.6]	10.2 [10.0–10.3]
Emergency caesarean birth					
Numerator/denominator (n)	21 068/154 008	24 609/172 831	27 564/193 878	33 992/232 649	39 466/285 146
Crude rate [95% CI] (%)	13.7 [13.5–13.8]	14.2 [14.1–14.4]	14.2 [14.1–14.4]	14.6 [14.5–14.8]	13.8 [13.7–14.0]
Birth without intervention					
Numerator/denominator (n)	35 691/89 909	39 268/99 370	44 735/109 894	52 646/126 590	60 815/141 700
Crude rate [95% CI] (%)	39.8 [39.5–40.1]	39.6 [39.3–39.9]	40.6 [40.4–40.9]	41.6 [41.3–41.8]	42.9 [42.7–43.2]
Apgar score <7 at 5 minutes					
Numerator/denominator (n)	1 565/144 866	2 110/159 133	2 478/176 776	2 947/201 385	3 625/241 555
Crude rate [95% CI] (%)	1.08 [1.02–1.13]	1.33 [1.27–1.38]	1.40 [1.35–1.46]	1.46 [1.41–1.52]	1.50 [1.45–1.55]
Breast milk at first feed					
Numerator/denominator (n)	105 638/127 114	107 189/135 512	114 524/151 659	119 653/170 008	120 592/200 188
Crude rate [95% CI] (%)	83.1 [82.9–83.3]	79.1 [78.9–79.3]	75.5 [75.3–75.7]	70.4 [70.1–70.6]	60.1 [59.9–60.3]
Neonatal unit admission at term					
Numerator/denominator (n)	6 709/136 910	7 913/152 091	9 115/170 707	11 108/205 905	14 401/257 840
Crude rate [95% CI] (%)	4.89 [4.78–5.01]	5.20 [5.09–5.31]	5.34 [5.23–5.45]	5.40 [5.30–5.50]	5.59 [5.50–5.67]

^b The IMD quintile is derived from the recorded standardised socio-economic IMD rank of the individual's local area based on their postcode.³ As the areas used are of different granularity, the three individual countries are not directly comparable.

Appendix 2 Results for England

Table 8 Results for England stratified by ethnic group

Measure	Ethnic group ^a			
	White	South Asian	Black	Other
Postpartum haemorrhage ≥1500 ml				
Numerator/denominator (n)	16 783/641 174	2 352/91 013	1 313/36 144	1 464/46 598
Crude rate [95% CI] (%)	2.62 [2.58–2.66]	2.58 [2.48–2.69]	3.63 [3.44–3.83]	3.14 [2.98–3.30]
Caesarean birth (any)				
Numerator/denominator (n)	176 830/731 369	29 417/108 921	13 937/43 466	14 072/55 001
Crude rate [95% CI] (%)	24.2 [24.1–24.3]	27.0 [26.7–27.3]	32.1 [31.6–32.5]	25.6 [25.2–25.9]
Elective caesarean birth				
Numerator/denominator (n)	80 873/731 369	10 840/108 921	5 128/43 466	5 750/55 001
Crude rate [95% CI] (%)	11.1 [11.0–11.1]	10.0 [9.8–10.1]	11.8 [11.5–12.1]	10.5 [10.2–10.7]
Emergency caesarean birth				
Numerator/denominator (n)	95 957/731 369	18 577/108 921	8 809/43 466	8 322/55 001
Crude rate [95% CI] (%)	13.1 [13.0–13.2]	17.1 [16.8–17.3]	20.3 [19.9–20.6]	15.1 [14.8–15.4]
Birth without intervention				
Numerator/denominator (n)	167 430/398 681	21 173/50 615	8 904/18 894	12 236/27 623
Crude rate [95% CI] (%)	42.0 [41.8–42.1]	41.8 [41.4–42.3]	47.1 [46.4–47.8]	44.3 [43.7–44.9]
Apgar score <7 at 5 minutes				
Numerator/denominator (n)	9 320/653 022	875/89 465	602/35 526	542/47 248
Crude rate [95% CI] (%)	1.43 [1.40–1.46]	0.98 [0.91–1.04]	1.69 [1.56–1.83]	1.15 [1.05–1.24]
Breast milk at first feed				
Numerator/denominator (n)	398 117/566 139	61 565/74 799	26 654/30 479	33 103/38 731
Crude rate [95% CI] (%)	70.3 [70.2–70.4]	82.3 [82.0–82.6]	87.5 [87.1–87.8]	85.5 [85.1–85.8]
Neonatal unit admission at term				
Numerator/denominator (n)	35 043/671 718	5 640/99 462	2 380/40 393	2 443/50 182
Crude rate [95% CI] (%)	5.22 [5.16–5.27]	5.67 [5.53–5.81]	5.89 [5.66–6.12]	4.87 [4.68–5.06]

^a Ethnic group is recorded in the NMPA dataset using ONS 16+1 categories from 2001 UK census² and subsequently collapsed into four categories.

Table 9 Results for England stratified by IMD

Measure	IMD ^b				
	1 = least deprived	2	3	4	5 = most deprived
Postpartum haemorrhage ≥1500 ml					
Numerator/denominator (n)	3 755/124 258	3 936/137 559	4 349/155 361	4 884/185 566	4 988/212 185
Crude rate [95% CI] (%)	3.02 [2.93–3.12]	2.86 [2.77–2.95]	2.80 [2.72–2.88]	2.63 [2.56–2.70]	2.35 [2.29–2.42]
Caesarean birth (any)					
Numerator/denominator (n)	36 463/136 657	40 023/155 016	44 074/175 679	52 327/211 505	61 369/259 900
Crude rate [95% CI] (%)	26.7 [26.4–26.9]	25.8 [25.6–26.0]	25.1 [24.9–25.3]	24.7 [24.6–24.9]	23.6 [23.4–23.8]
Elective caesarean birth					
Numerator/denominator (n)	17 943/136 657	18 250/155 016	19 304/175 679	21 586/211 505	25 508/259 900
Crude rate [95% CI] (%)	13.1 [13.0–13.3]	11.8 [11.6–11.9]	11.0 [10.8–11.1]	10.2 [10.1–10.3]	9.8 [9.7–9.9]
Emergency caesarean birth					
Numerator/denominator (n)	18 520/136 657	21 773/155 016	24 770/175 679	30 741/211 505	35 861/259 900
Crude rate [95% CI] (%)	13.6 [13.4–13.7]	14.0 [13.9–14.2]	14.1 [13.9–14.3]	14.5 [14.4–14.7]	13.8 [13.7–13.9]
Birth without intervention					
Numerator/denominator (n)	31 839/77 634	35 168/86 394	40 421/96 787	47 545/111 072	54 770/123 926
Crude rate [95% CI] (%)	41.0 [40.7–41.4]	40.7 [40.4–41.0]	41.8 [41.5–42.1]	42.8 [42.5–43.1]	44.2 [43.9–44.5]
Apgar score <7 at 5 minutes					
Numerator/denominator (n)	1 355/127 684	1 900/141 544	2 215/158 822	2 633/180 511	3 236/216 700
Crude rate [95% CI] (%)	1.06 [1.01–1.12]	1.34 [1.28–1.40]	1.39 [1.34–1.45]	1.46 [1.40–1.51]	1.49 [1.44–1.54]
Breast milk at first feed					
Numerator/denominator (n)	94 353/113 302	96 737/121 391	104 933/137 289	110 638/154 264	112 778/183 902
Crude rate [95% CI] (%)	83.3 [83.1–83.5]	79.7 [79.5–79.9]	76.4 [76.2–76.7]	71.7 [71.5–71.9]	61.3 [61.1–61.5]
Neonatal unit admission at term					
Numerator/denominator (n)	6 123/127 019	7 248/140 805	8 433/159 697	10 295/193 003	13 407/241 231
Crude rate [95% CI] (%)	4.82 [4.70–4.94]	5.15 [5.03–5.26]	5.28 [5.17–5.39]	5.33 [5.23–5.43]	5.56 [5.47–5.65]

^b The IMD quintile is derived from the recorded standardised socio-economic IMD rank of the individual's local area based on their postcode.³ As the areas used are of different granularity, the three individual countries are not directly comparable.

Appendix 3 Results for Scotland

Table 10 Results for Scotland stratified by ethnic group

Measure	Ethnic group ^a			
	White	South Asian	Black	Other
Caesarean birth (any)				
Numerator/denominator (n)	21 159/69 300	849/2 648	433/1 095	563/1 860
Crude rate [95% CI] (%)	30.5 [30.2–30.9]	32.1 [30.3–33.8]	39.5 [36.6–42.4]	30.3 [28.2–32.4]
Elective caesarean birth				
Numerator/denominator (n)	10 373/69 300	355/2 648	199/1 095	260/1 860
Crude rate [95% CI] (%)	15.0 [14.7–15.2]	13.4 [12.1–14.7]	18.2 [15.9–20.5]	14.0 [12.4–15.6]
Emergency caesarean birth				
Numerator/denominator (n)	10 786/69 300	494/2 648	234/1 095	303/1 860
Crude rate [95% CI] (%)	15.6 [15.3–15.8]	18.7 [17.2–20.1]	21.4 [18.9–23.8]	16.3 [14.6–18.0]
Birth without intervention				
Numerator/denominator (n)	20 147/62 016	794/2 372	348/931	606/1 655
Crude rate [95% CI] (%)	32.5 [32.1–32.9]	33.5 [31.6–35.4]	37.4 [34.3–40.5]	36.6 [34.3–38.9]
Apgar score <7 at 5 minutes				
Numerator/denominator (n)	1 011/68 221	31/2 610	21/1 077	15/1 833
Crude rate [95% CI] (%)	1.48 [1.39–1.57]	1.19 [0.77–1.60]	1.95 [1.12–2.78]	0.82 [0.41–1.23]
Breast milk at first feed				
Numerator/denominator (n)	29 931/45 602	1 420/1 602	690/756	1 089/1 223
Crude rate [95% CI] (%)	65.6 [65.2–66.1]	88.6 [87.1–90.2]	91.3 [89.3–93.3]	89.0 [87.3–90.8]
Neonatal unit admission at term				
Numerator/denominator (n)	3 496/57 436	128/1 961	48/851	68/1 450
Crude rate [95% CI] (%)	6.09 [5.89–6.28]	6.53 [5.43–7.62]	5.64 [4.09–7.19]	4.69 [3.60–5.78]

^a Ethnic group is recorded in the NMPA dataset using ONS 16+1 categories from 2001 UK census² and subsequently collapsed into four categories.

Table 11 Results for Scotland stratified by IMD

Measure	IMD ^b				
	1 = least deprived	2	3	4	5 = most deprived
Caesarean birth (any)					
Numerator/denominator (n)	4 326/13 272	4 407/13 867	4 204/13 583	4 655/15 682	5 412/18 499
Crude rate [95% CI] (%)	32.6 [31.8–33.4]	31.8 [31.0–32.6]	31.0 [30.2–31.7]	29.7 [29.0–30.4]	29.3 [28.6–29.9]
Elective caesarean birth					
Numerator/denominator (n)	2 254/13 272	2 141/13 867	2 007/13 583	2 154/15 682	2 631/18 499
Crude rate [95% CI] (%)	17.0 [16.3–17.6]	15.4 [14.8–16.0]	14.8 [14.2–15.4]	13.7 [13.2–14.3]	14.2 [13.7–14.7]
Emergency caesarean birth					
Numerator/denominator (n)	2 072/13 272	2 266/13 867	2 197/13 583	2 501/15 682	2 781/18 499
Crude rate [95% CI] (%)	15.6 [15.0–16.2]	16.3 [15.7–17.0]	16.2 [15.6–16.8]	15.9 [15.4–16.5]	15.0 [14.5–15.5]
Birth without intervention					
Numerator/denominator (n)	3 745/11 898	3 896/12 349	3 974/12 147	4 649/14 100	5 631/16 480
Crude rate [95% CI] (%)	31.5 [30.6–32.3]	31.5 [30.7–32.4]	32.7 [31.9–33.6]	33.0 [32.2–33.7]	34.2 [33.4–34.9]
Apgar score <7 at 5 minutes					
Numerator/denominator (n)	171/13 116	166/13 664	205/13 367	241/15 441	295/18 153
Crude rate [95% CI] (%)	1.30 [1.11–1.50]	1.21 [1.03–1.40]	1.53 [1.33–1.74]	1.56 [1.37–1.76]	1.63 [1.44–1.81]
Breast milk at first feed					
Numerator/denominator (n)	8 154/9 713	7 692/10 100	6 675/9 688	6 014/10 234	4 595/9 448
Crude rate [95% CI] (%)	83.9 [83.2–84.7]	76.2 [75.3–77.0]	68.9 [68.0–69.8]	58.8 [57.8–59.7]	48.6 [47.6–49.6]
Neonatal unit admission at term					
Numerator/denominator (n)	586/9 891	665/11 286	682/11 010	813/12 902	994/16 609
Crude rate [95% CI] (%)	5.92 [5.46–6.39]	5.89 [5.46–6.33]	6.19 [5.74–6.64]	6.30 [5.88–6.72]	5.98 [5.62–6.35]

^b The IMD quintile is derived from the recorded standardised socio-economic IMD rank of the individual's local area based on their postcode.³ As the areas used are of different granularity, the three individual countries are not directly comparable.

Appendix 4 Results for Wales

Table 12 Results for Wales stratified by Ethnic group

Measure	Ethnic group ^a			
	White	South Asian	Black	Other
Postpartum haemorrhage ≥1500 ml				
Numerator/denominator (n)	814/21 800	25/830	11/370	49/1 505
Crude rate [95% CI] (%)	3.73 [3.48–3.99]	3.01 [1.85–4.17]	2.97 [1.24–4.70]	3.26 [2.36–4.15]
Caesarean birth (any)				
Numerator/denominator (n)	5 471/22 134	215/836	106/369	352/1 513
Crude rate [95% CI] (%)	24.7 [24.1–25.3]	25.7 [22.8–28.7]	28.7 [24.1–33.3]	23.3 [21.1–25.4]
Elective caesarean birth				
Numerator/denominator (n)	2 616/22 134	91/836	52/369	168/1 513
Crude rate [95% CI] (%)	11.8 [11.4–12.2]	10.9 [8.8–13.0]	14.1 [10.5–17.6]	11.1 [9.5–12.7]
Emergency caesarean birth				
Numerator/denominator (n)	2 855/22 134	124/836	54/369	184/1 513
Crude rate [95% CI] (%)	12.9 [12.5–13.3]	14.8 [12.4–17.2]	14.6 [11.0–18.2]	12.2 [10.5–13.8]
Birth without intervention				
Numerator/denominator (n)	1 460/4 474	15/43	5/13	37/146
Crude rate [95% CI] (%)	32.6 [31.3–34.0]	34.9 [20.6–49.1]	38.5 [12.0–64.9]	25.3 [18.3–32.4]
Apgar score <7 at 5 minutes				
Numerator/denominator (n)	286/22 014	7/829	6/364	9/1 506
Crude rate [95% CI] (%)	1.30 [1.15–1.45]	0.84 [0.22–1.47]	1.65 [0.34–2.96]	0.60 [0.21–0.99]
Breast milk at first feed				
Numerator/denominator (n)	12 928/22 389	669/842	299/368	1 131/1 551
Crude rate [95% CI] (%)	57.7 [57.1–58.4]	79.5 [76.7–82.2]	81.2 [77.3–85.2]	72.9 [70.7–75.1]

^a Ethnic group is recorded in the NMPA dataset using ONS 16+1 categories from 2001 UK census² and subsequently collapsed into four categories.

Table 13 Results for Wales stratified by IMD

Measure	IMD ^b				
	1 = least deprived	2	3	4	5 = most deprived
Postpartum haemorrhage ≥1500 ml					
Numerator/denominator (n)	174/4 035	166/3 880	177/4 531	198/5 382	184/6 677
Crude rate [95% CI] (%)	4.31 [3.69–4.94]	4.28 [3.64–4.92]	3.91 [3.34–4.47]	3.68 [3.18–4.18]	2.76 [2.36–3.15]
Caesarean birth (any)					
Numerator/denominator (n)	1 030/4 079	1 077/3 948	1 123/4 616	1 368/5 462	1 546/6 747
Crude rate [95% CI] (%)	25.3 [23.9–26.6]	27.3 [25.9–28.7]	24.3 [23.1–25.6]	25.0 [23.9–26.2]	22.9 [21.9–23.9]
Elective caesarean birth					
Numerator/denominator (n)	554/4 079	507/3 948	526/4 616	618/5 462	722/6 747
Crude rate [95% CI] (%)	13.6 [12.5–14.6]	12.8 [11.8–13.9]	11.4 [10.5–12.3]	11.3 [10.5–12.2]	10.7 [10.0–11.4]
Emergency caesarean birth					
Numerator/denominator (n)	476/4 079	570/3 948	597/4 616	750/5 462	824/6 747
Crude rate [95% CI] (%)	11.7 [10.7–12.7]	14.4 [13.3–15.5]	12.9 [12.0–13.9]	13.7 [12.8–14.6]	12.2 [11.4–13.0]
Birth without intervention					
Numerator/denominator (n)	107/377	204/627	340/960	452/1 418	414/1 294
Crude rate [95% CI] (%)	28.4 [23.8–32.9]	32.5 [28.9–36.2]	35.4 [32.4–38.4]	31.9 [29.5–34.3]	32.0 [29.5–34.5]
Apgar score <7 at 5 minutes					
Numerator/denominator (n)	39/4 066	44/3 925	58/4 587	73/5 433	94/6 702
Crude rate [95% CI] (%)	0.96 [0.66–1.26]	1.12 [0.79–1.45]	1.26 [0.94–1.59]	1.34 [1.04–1.65]	1.40 [1.12–1.68]
Breast milk at first feed					
Numerator/denominator (n)	3 131/4 099	2 760/4 021	2 916/4 682	3 001/5 510	3 219/6 838
Crude rate [95% CI] (%)	76.4 [75.1–77.7]	68.6 [67.2–70.1]	62.3 [60.9–63.7]	54.5 [53.1–55.8]	47.1 [45.9–48.3]

^b The IMD quintile is derived from the recorded standardised socio-economic IMD rank of the individual's local area based on their postcode.³ As the areas used are of different granularity, the three individual countries are not directly comparable.