

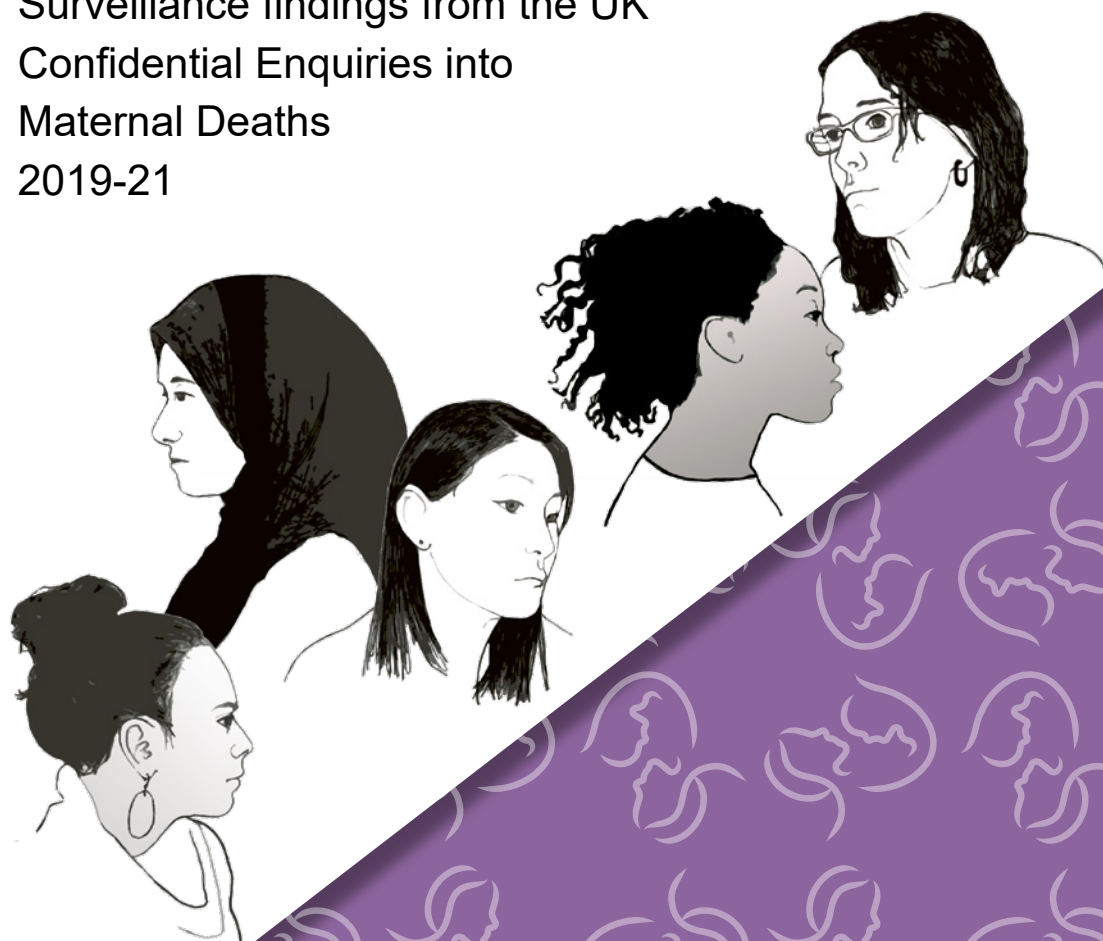
Maternal, Newborn and Infant Clinical Outcome Review Programme



Saving Lives, Improving Mothers' Care

State of the Nation Surveillance Report

Surveillance findings from the UK
Confidential Enquiries into
Maternal Deaths
2019-21



October 2023



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

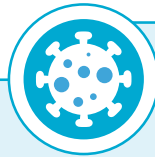
Key messages

from the surveillance report 2023

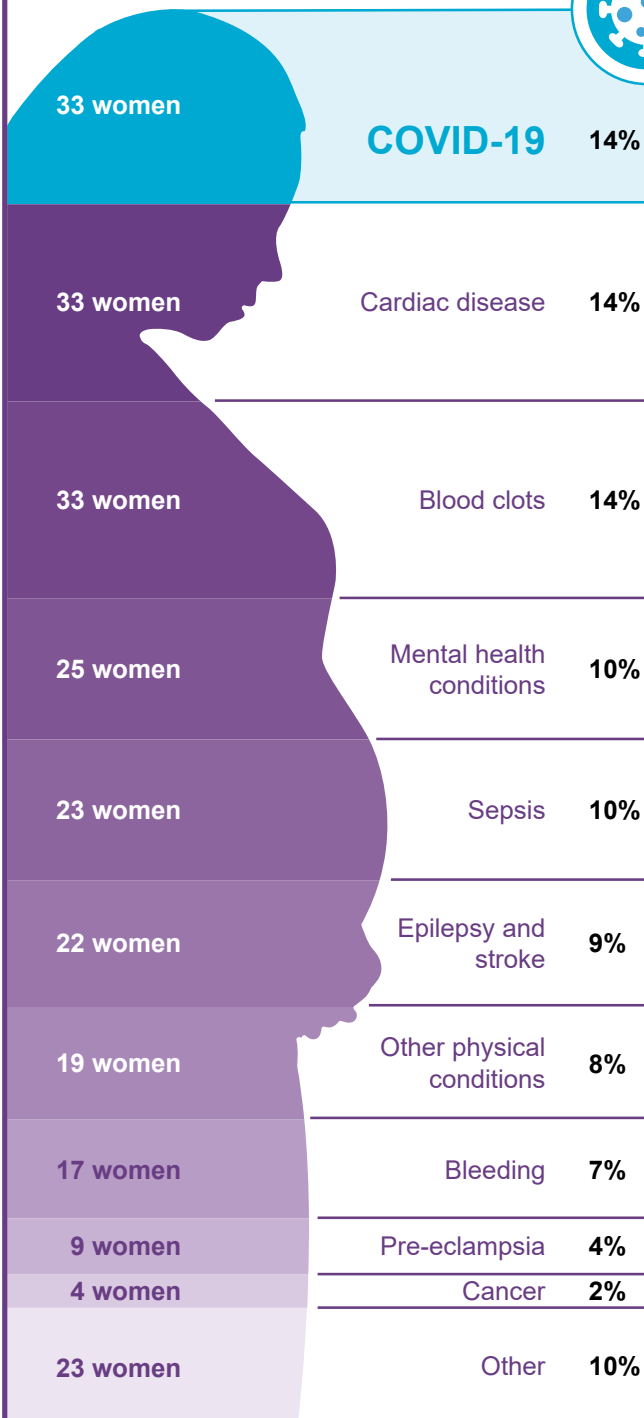
In 2019-21, **241 women died** during or up to six weeks after pregnancy among 2,066,997 women giving birth in the UK.

11.7 women per 100,000 died during pregnancy or up to six weeks after childbirth or the end of pregnancy.

Causes of women's deaths

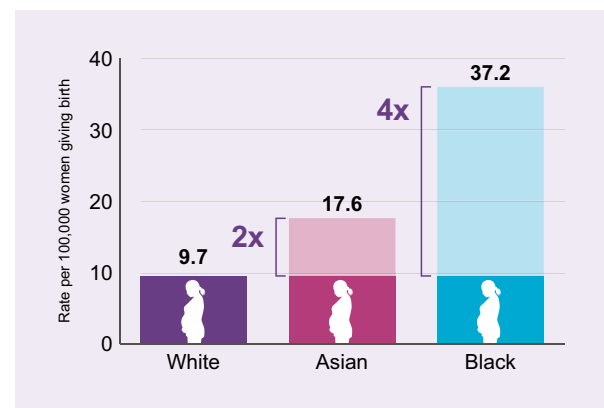


When maternal deaths due to COVID-19 are excluded, **10.1 women** per 100,000 died during pregnancy or up to six weeks after childbirth or the end of pregnancy

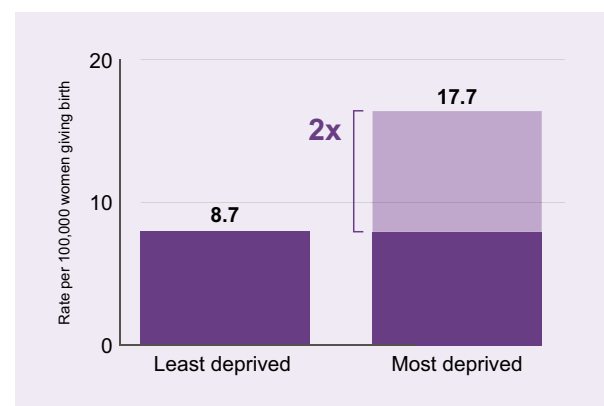


Inequalities in maternal mortality

Ethnic group



Living in more deprived areas



1. Introduction and methods

Important note **NEW FOR 2023.** In accordance with funder requirements, the findings of the MBRRACE-UK Confidential Enquiry into Maternal Deaths and Morbidity (CEMD) are now presented as multiple outputs instead of one report as produced previously. The following outputs are now required to be produced in 2023:

1. An online Data Brief with basic statistics concerning maternal mortality published in advance of the reports. In 2023 this includes information on women who died between 2019 and 2021.
2. A State of the Nation surveillance report with extended details concerning maternal mortality and the characteristics of women who died. In 2023 this includes information on women who died between 2019 and 2021 (**THIS REPORT**). Online supplementary material with the full data is also available.
3. A State of the Nation themed confidential enquiry report concerning women who died from specific causes and from selected severe morbidities. In 2023 this includes information on women who died from obstetric haemorrhage, amniotic fluid embolism and anaesthetic causes between 2019 and 2021 and women with morbidity following repeat caesarean birth and five national recommendations. Online supplementary material is also available.
4. A State of the Nation themed confidential enquiry report concerning women who died from specific causes. In 2023 this includes information on women who died from infection, neurological, haematological, respiratory, endocrine, gastrointestinal and general surgical causes between 2019 and 2021 and five national recommendations. Online supplementary material is also available.

Together these comprise all the information that was previously included in the single report. Background, aims and scope of work, and details of methods and authors for the sections on different topics are available in online supplementary material at: www.npeu.ox.ac.uk/mbrance-uk/reports.

Key to colour coding

Vignettes concerning the care of women who died are described in blue boxes

Vignettes concerning the care of women who had severe morbidity but survived are described in purple boxes with the character M in the corner M

New national recommendations are presented in purple boxes with the character N in the corner N

All existing guidance requiring improved implementation is presented in green boxes in the online supplementary material for this report NICE 2345

2. National summary data

1. There was a statistically non-significant increase in the overall maternal death rate in the UK between 2016-18 and 2019-21. When deaths due to COVID-19 in 2020 and 2021 were excluded, maternal death rates were very similar for the two periods, which suggests that an even greater focus on implementation of the recommendations of these reports is needed to achieve a reduction in maternal deaths.
2. There remains a nearly four-fold difference in maternal mortality rates amongst women from Black ethnic backgrounds and an almost two-fold difference amongst women from Asian ethnic backgrounds compared to White women. Twelve percent of the women who died during or up to a year after pregnancy in the UK in 2019-21 were at severe and multiple disadvantage. The main elements of multiple disadvantage were a mental health diagnosis, substance use and domestic abuse. Women living in the most deprived areas continue to have the highest maternal mortality rates, emphasising the need for a continued focus on action to address these disparities.
3. Cardiovascular disorders and thrombosis and thromboembolism are now responsible for the same number of maternal deaths in the UK, followed by psychiatric disorders; together, these three causes represent 38% of maternal deaths. During 2020 and 2021, maternal mortality directly attributable to COVID-19 was at a rate well in excess of that due to any other single cause.
4. There was a significant 33% increase in maternal death rates from direct causes between 2016-18 and 2019-21 (95% confidence interval 0%-45%, $p=0.043$). Thrombosis and thromboembolism remains the leading cause of direct maternal death during or up to six weeks after the end of pregnancy.
5. Deaths from mental health-related causes as a whole account for nearly 40% of deaths occurring between six weeks and a year after the end of pregnancy with maternal suicide remaining the leading cause of direct deaths in this period.

3. Key messages

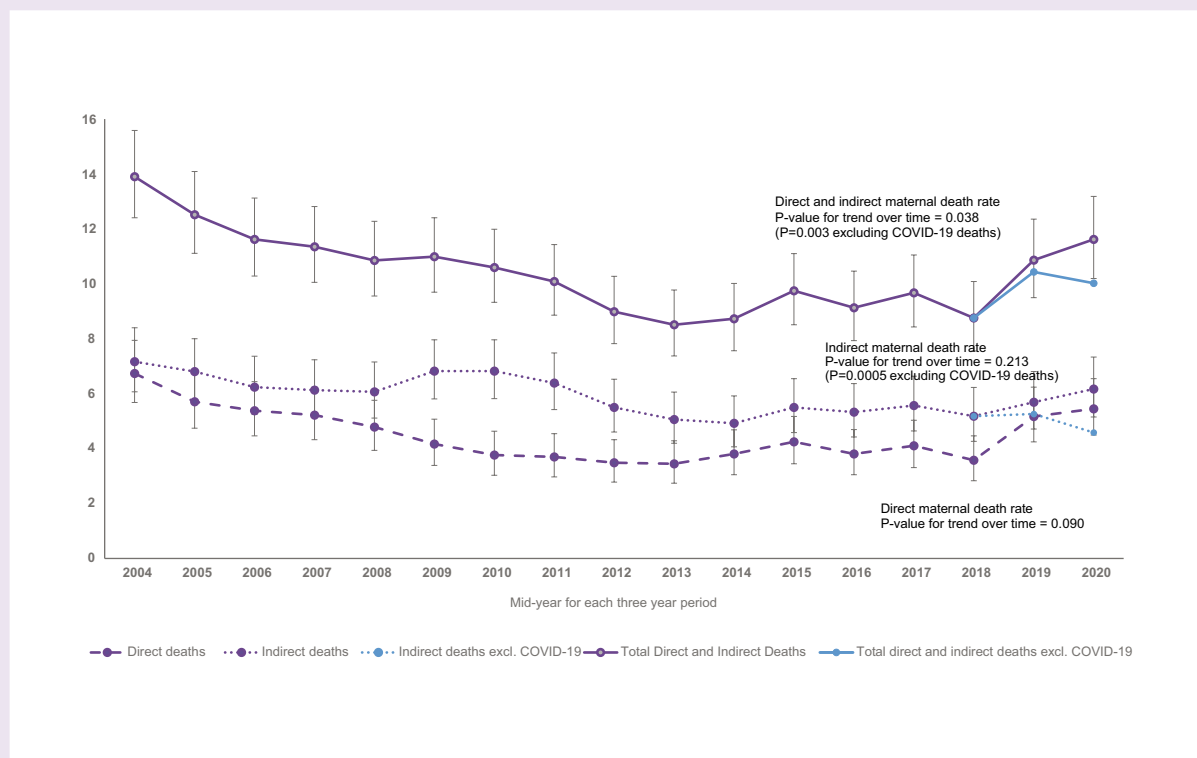
Note that more in-depth analysis is available at: www.npeu.ox.ac.uk/mbrance-uk/reports

3.1 Causes and trends

Overall, 261 women died in 2019-21 during or within 42 days of the end of pregnancy in the UK. The deaths of 20 women were classified as coincidental. Thus, in this triennium, 241 women died from direct and indirect causes, classified using ICD-MM (World Health Organisation 2012), among 2,066,997 maternities, a maternal death rate of 11.66 per 100,000 maternities (95% CI 10.23 – 13.23). This compares to the rate of 10.90 per 100,000 maternities (95% CI 9.53 – 12.40) in 2018-20 (rate ratio (RR) 1.07, 95% CI 0.89-1.29, p=0.463). Nine of the deaths which occurred between March and December 2020 and 24 of those during 2021 were directly attributable to SARS-CoV-2 infection. If these COVID-19 attributable deaths were excluded, the maternal mortality rate for 2019-21 would be 10.06 (95% CI 8.74 – 11.53), lower than the corresponding rate for 2018-20 (10.47 (95%CI 9.13-11.95) but not significantly so (RR 0.96 (95%CI 0.79 – 1.17), p=0.684).

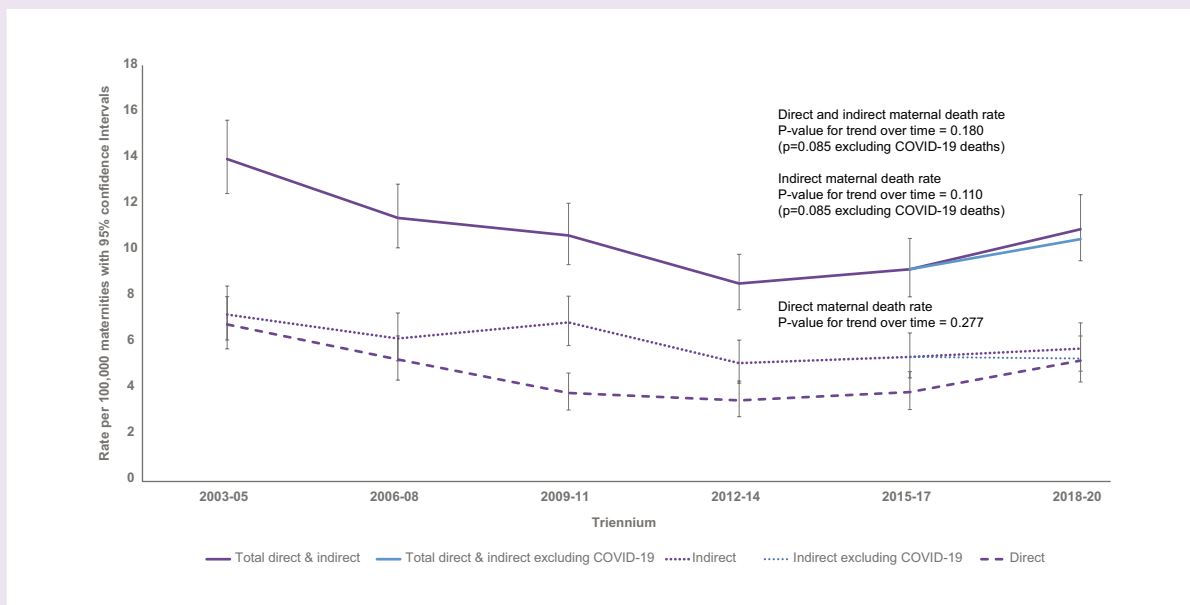
Figure 1 (*Supplemental Table 2.1*) shows rolling three-year average maternal death rates since 2003 using ICD-MM. There remains an overall decrease in maternal death rates between 2003-05 and 2019-21 (RR 0.84, 95% CI 0.70-0.99, p=0.038 for trend in rolling rates over time). The direct maternal death rate has decreased by 19% since 2003-05 (RR 0.81, 95% CI 0.63-1.04, p=.090) and there was a 14% decrease in the rate of indirect maternal deaths (RR 0.86, 95% CI 0.68-1.10, p=0.213).

Figure 1: Direct and indirect maternal mortality rates per 100,000 maternities using ICD-MM and previous UK classification systems; three-year rolling average rates 2003-2021



The progress towards the Government ambition to reduce maternal mortality by 50% between 2010 and 2025 in England (Department of Health 2017) can be assessed by comparing maternal death rates between the 2009-11 and 2019-21 triennia. Over this time, maternal mortality has increased by 15%, (RR 1.15, 95% CI 0.96-1.38). Even when maternal deaths directly attributable to COVID-19 are excluded, maternal mortality over this period has decreased by just 1% (RR 0.99, 95% CI 0.82-1.20). Triennial rates are shown in Figure 2 (*Supplemental Table 2.2*).

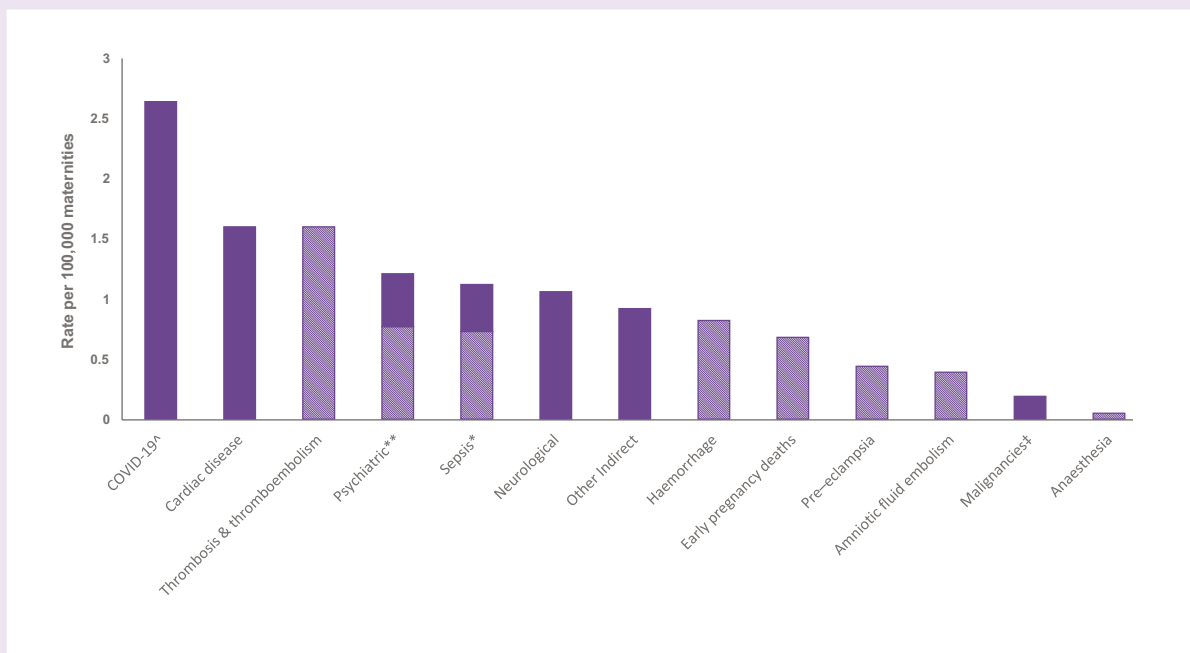
Figure 2: Direct and Indirect maternal mortality rates per 100,000 maternities by discrete triennia; UK 2003-2020 (using ICD-MM)



3.1.1 Deaths due to individual causes

Maternal deaths by cause are shown in Figure 3 (*Supplemental Table 2.3 and 2.4*) and deaths classified according to ICD-MM sub-groups are presented in Figure 4 (*Supplemental Table 2.5*).

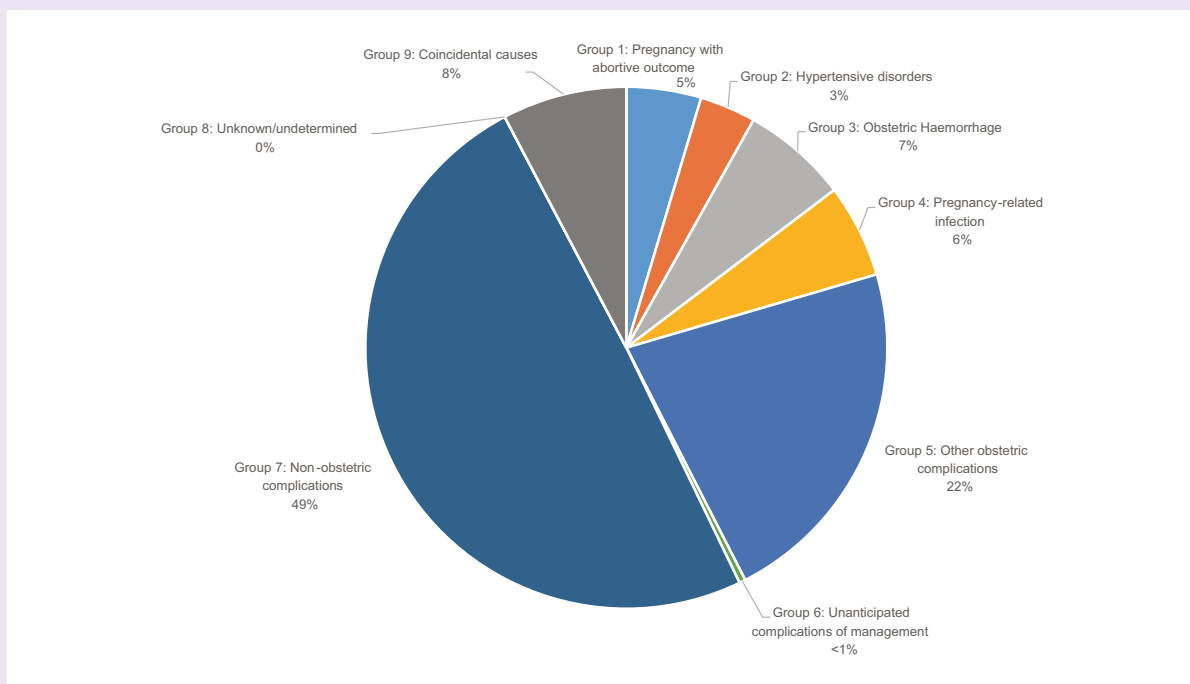
Figure 3: Maternal mortality by cause UK 2019-21



Hatched bars show direct causes of death, solid bars indicate indirect causes of death; *Rate for direct sepsis (genital tract sepsis and other pregnancy related infections) is shown in hatched and rate for indirect sepsis (influenza, pneumonia, others) in solid bar; **Rate for suicides (direct) is shown in hatched and rate for indirect psychiatric causes (drugs/alcohol) in solid bar; ‡Rate for indirect malignancies (breast/ovary/cervix); †Rate for Covid-19 deaths calculated using maternities March 2020 to December 2021 as denominator. Source: MBRRACE-UK

Available as supplementary material at: www.npeu.ox.ac.uk/mbrance-uk/reports.

Figure 4: Maternal mortality proportions by ICD-MM classification UK 2019-21



3.1.2 International comparison

For international comparison, the rate estimated from routine sources of data is much lower (6.04 per 100,000 live-births, 95% CI 5.04-7.18, for 2018-20, *Supplemental Table 2.6*) than the actual rates as identified through the UK CEMD, which uses multiple sources of death identification.

3.1.3 Women who died between six weeks and one year after the end of pregnancy

In the triennium 2019-21, 311 women died between six weeks and one year after the end of pregnancy, representing a mortality rate of 15.05 per 100,000 maternities (95% CI 13.42 – 16.81). Rolling rates of late deaths are shown in Figure 5 and causes of late death in Figure 6.

Figure 5: Pregnancy-associated maternal mortality rates six weeks to one year after the end of pregnancy, UK 2009-2021

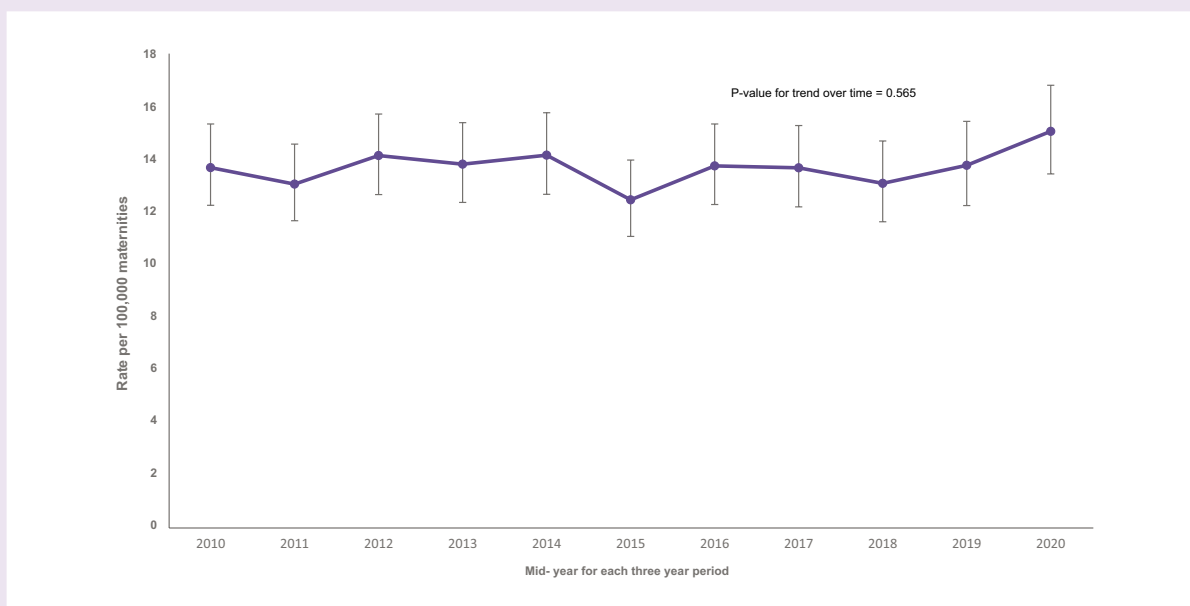
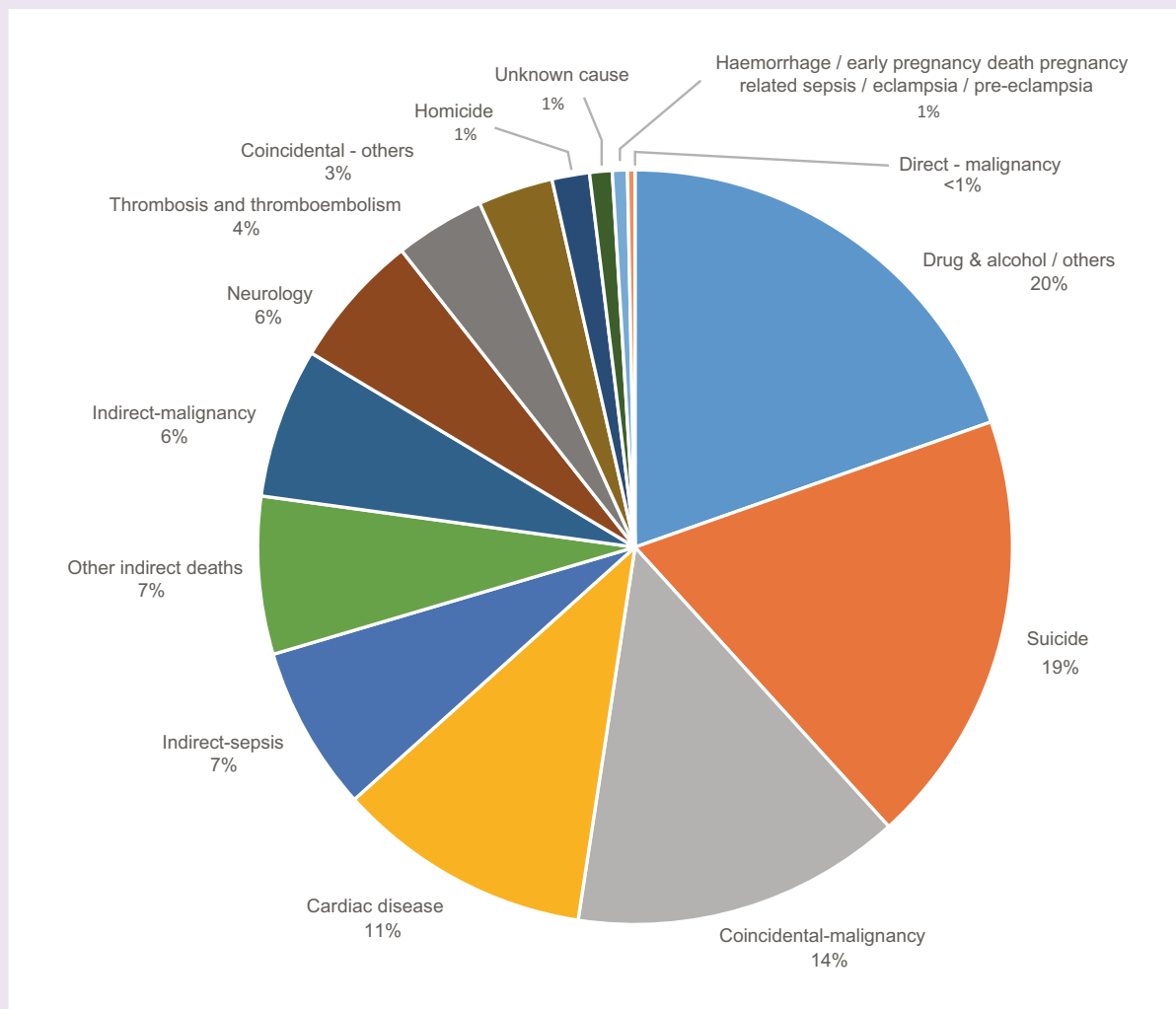


Figure 6: Causes of death amongst women who died between six weeks and one year after the end of pregnancy, UK 2019-21



3.2 The characteristics of women who died 2019-21

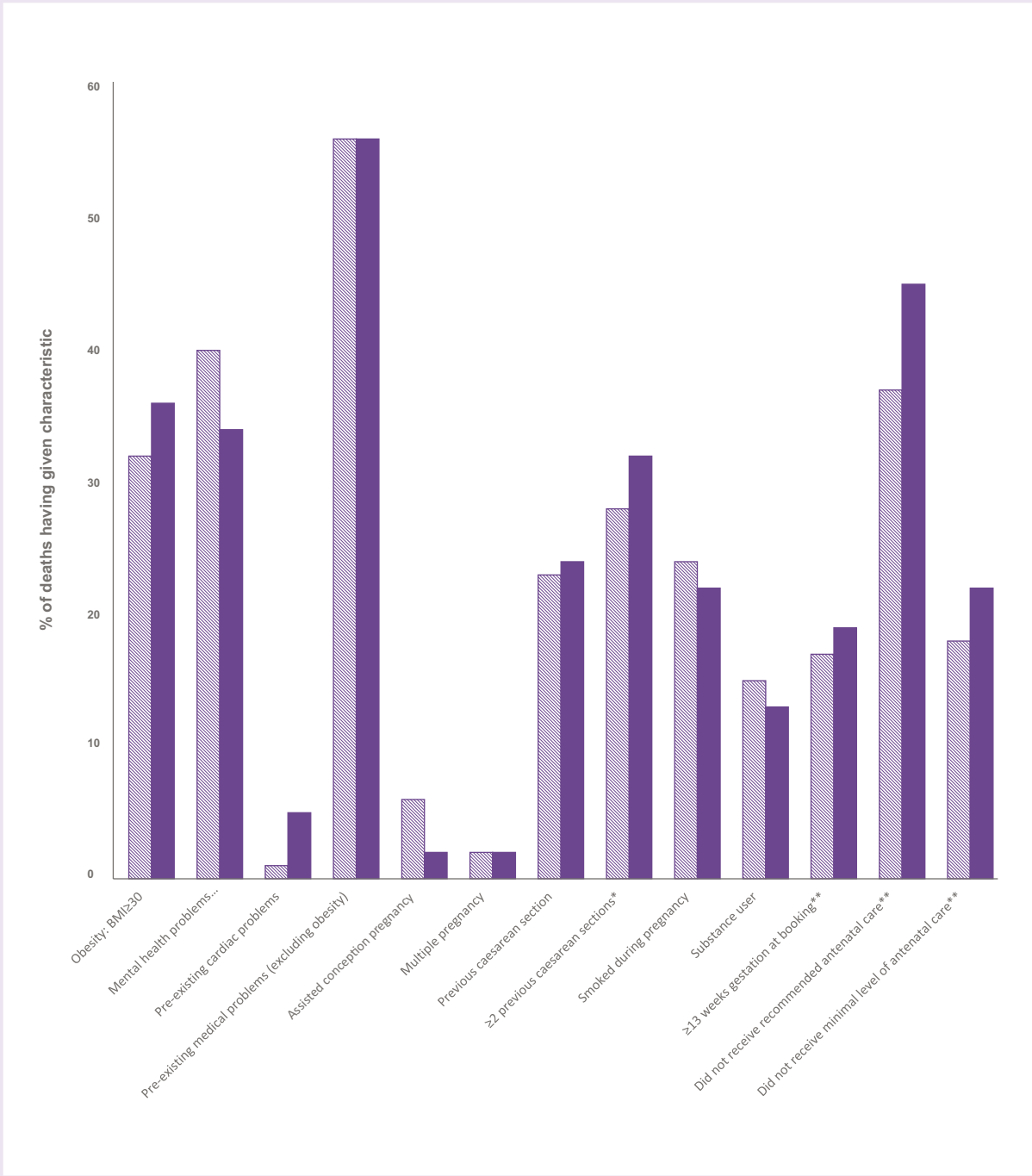
Of the 241 women who died from direct and indirect causes during or up to 42 days after the end of their pregnancy in 2019-21, 26% (62 women) were still pregnant at the time of their death and of these women 66% were ≤ 20 weeks' gestation (*Supplemental Tables 2.7*). The majority of the 154 women who gave birth at more than 20 weeks gestation did so in hospital (84%); 10% of women gave birth in an emergency department or an ambulance, and 6% at home (*Supplemental Table 2.8*).

3.2.1 Socio-demographic characteristics

The socio-demographic characteristics of women who died in 2019-21 are shown in Figure 7 (*Supplemental Tables 2.9-2.16*).

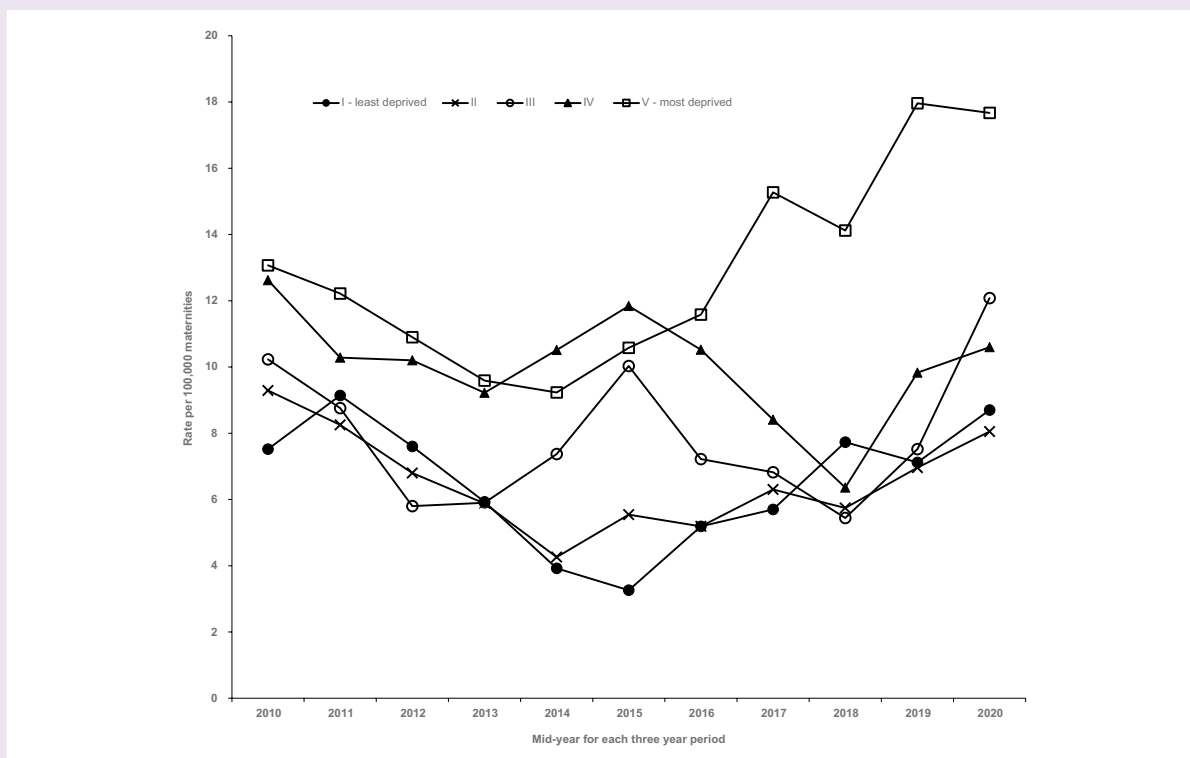
Women living in the most deprived areas continue to have the highest maternal mortality rates (Figure 8). The mortality rates among women from different ethnic groups are shown in Figure 9. The risk of maternal death in 2019-21 was statistically nearly four times higher among women from Black ethnic minority backgrounds compared with White women (RR 3.84; 95% CI 2.48 to 5.78); this is slightly higher than the figure reported for 2018-20 but represents a non-significant reduction from the 4.35 fold difference reported for 2016-18. Women from Asian backgrounds also continued to be at higher risk than White women (RR 1.82, 95% CI 1.21 to 2.67).

Figure 7: Selected characteristics of women who died from direct or indirect causes 2019-21



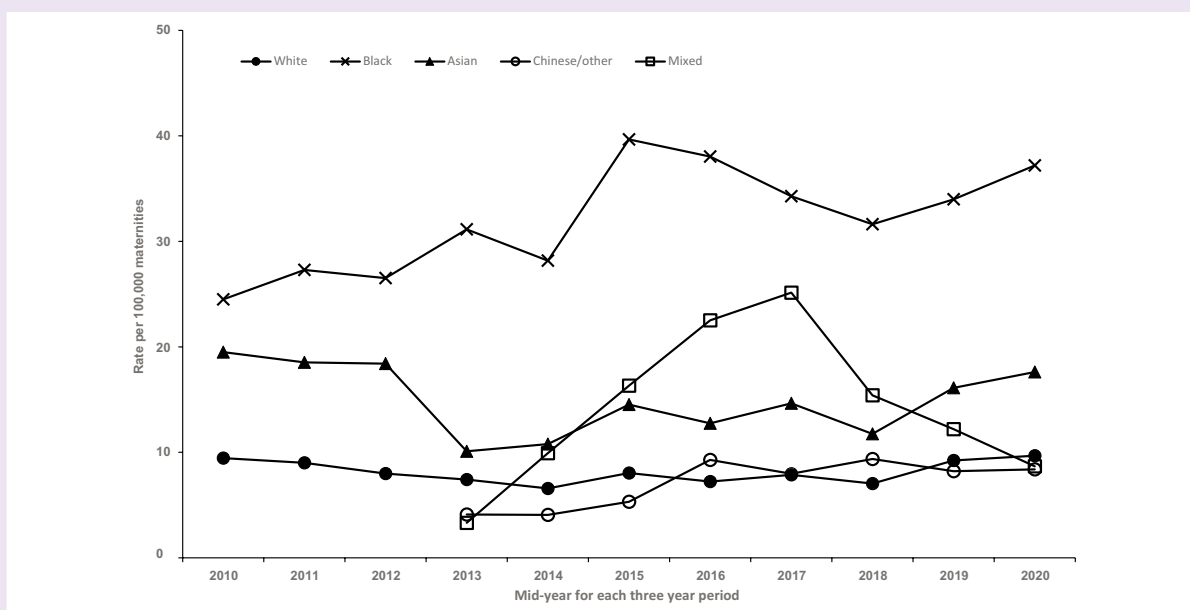
Hatched bars show women who died from direct causes of death, solid bars indicate those who died from indirect causes of death. *Amongst women who had a previous caesarean birth, **NICE recommended antenatal care: booked at 10 weeks or less and no antenatal visits missed. Minimum level of care: booked at less than 13 weeks and 3 or fewer antenatal visits missed.

Figure 8: Maternal mortality rates among women from different levels of socioeconomic deprivation in England* 2009-21



*Data for England only due to availability of denominator data

Figure 9: Maternal mortality rates among women from different ethnic groups in England* 2009-21

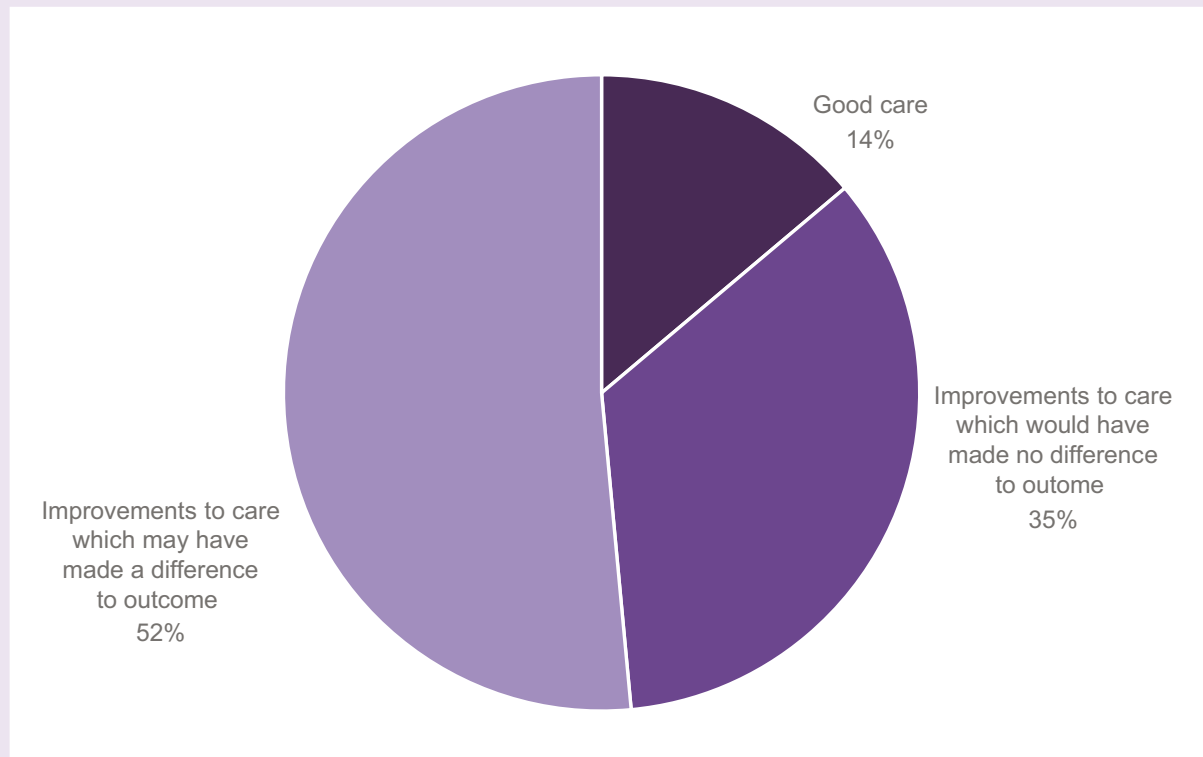


*Data for England only due to availability of denominator data

3.2.2 Classification of quality of care

This section includes information on women who died between 2019 and 2021 and are included in this year’s confidential enquiry reports (including women who died between six weeks and a year after the end of pregnancy and women from the Republic of Ireland). Figure 10 (**Supplemental Table 2.17**) shows the classification of care as agreed by the assessors for the 190 such women who died and whose case notes were available with sufficient information for an in-depth review. Among the women who died, 14% were assessed to have received good care, but detailed assessment showed that for another 52% improvements in care may have made a difference to their outcome.

Figure 10: Classification of care received by women who died and are included in the confidential enquiry State of the Nation Themed reports, UK and Ireland (2019-21)



References available as supplementary material at: www.npeu.ox.ac.uk/mbrance-uk/reports.

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