

The **Research** section

In the **Research** section this issue, Sarah Fisher summarises the research on social inequalities in maternal and perinatal mortality, NCT librarian Lynn Balmforth completes her two-part article on how to research effectively, and Jackie Topp discusses some of the themes emerging from her PhD research on disabled women's experience of midwife care

Social inequalities in maternal and perinatal mortality:

a summary of research

by NCT Policy Research Officer, Sarah Fisher

Introduction

This paper presents data on maternal and perinatal mortality and social inequalities to explore the extent to which women of certain social groups or circumstances are at greater risk of maternal and perinatal death. Maternal mortality data are provided by the CEMACH *Saving Mothers' Lives*¹ enquiry into maternal deaths in the UK in 2003-05. For perinatal mortality, ONS data for England and Wales² are supplemented by CEMACH perinatal mortality data³ to provide further analysis by social factors.

A range of social factors are examined for correlations with maternal and perinatal deaths, including marital and birth registration status and social class, deprivation, ethnicity, residency status, language, maternal age, smoking, maternal obesity, psychiatric problems (including substance abuse), and domestic abuse. Additionally, aspects of the maternity services which may disadvantage vulnerable groups are discussed, including poor access to care and substandard clinical care. It is beyond the scope of this paper to determine systematically how many of the social factors associated with higher mortality rates are confounders or the extent to which these factors have a cumulative effect upon health outcomes. However, known exposure to multiple social risk factors will be explored to illustrate how some women are highly disadvantaged in terms of maternal and perinatal mortality. Definitions of maternal and perinatal mortality are provided in Boxes 1 and 2.

Background

The official maternal mortality rate in the UK is 7.05 per 100,000 maternities, derived from 2003-05 death registration certificate data.¹

This rate is taken from the most recent CEMACH maternal deaths enquiry, from which the maternal mortality data presented in this paper are taken. The enquiry also produced a separate UK maternal mortality rate of 14 per 100,000 maternities, as a result of an enhanced proactive case-finding methodology which identified a greater number of maternal deaths. Yet because internationally maternal mortality rates are derived from death registration data alone, for international comparisons, which remain prone to inconsistencies, the official rate of 7.05 per 100,000 maternities must be used.¹ Since the 1950s there has been a twelve-fold reduction in maternal mortality, but from the mid-1980s the rate for direct deaths has remained relatively constant.^{4,1} The 2003-05 CEMACH maternal mortality report suggests that the lack of decline in the mortality rate may be partially attributable to factors associated with social inequalities, such as increasing numbers of births to women, including women born outside of the UK, whose social circumstances and health put them at increased risk of maternal death.¹

The United Kingdom perinatal mortality rates for 2006 were 7.9 per 1000 births in England and Wales,² 7.4 per 1000 births in Scotland⁵ and 6.9 per 1000 births in Northern Ireland.⁶ Unfortunately there is a lack of data on perinatal mortality and social factors in Scotland and Northern Ireland, so the analysis of perinatal mortality presented in this paper relates to England and Wales only. The perinatal mortality rate has also declined considerably since the 1950s but has remained largely unchanged over the last decade.^{3,7} As for maternal mortality, the CEMACH perinatal mortality report suggests that this could be a result of demographic

and deprivation-related factors which may be contributing to lack of progress in reducing stillbirth rates;³ however, this has yet to be demonstrated.

Inequalities in health are well documented and a vast amount of evidence exists to show that health outcomes are affected by a range of socio-demographic factors, such as social class and ethnicity, which determine an individual's overall life chances.⁸⁻¹¹ Following the change of the Westminster government in 1997 and the *Independent Inquiry into Inequalities in Health Report*¹² published in 1998, the need to address health inequalities has featured significantly in government policy on maternity and child health,¹³⁻¹⁶ as well as on the policy agenda elsewhere in the UK.¹⁷ Consequently, in 2002 the Department of Health set a target to reduce inequalities in infant mortality in England by 10% by 2010.¹⁸ The target compares the gap between the routine and manual social class group and the total population. While the target has focused attention on addressing health inequalities, to date progress towards the target has failed; in fact the gap has increased from a 13% difference in 1997-99 (the baseline period) to 17% in 2004-06.¹⁹ As part of the strategy to reduce inequalities, the latest Public Service Agreements focus on the need to improve attendance for antenatal care and increase breastfeeding.^{20,21}

Methodology and scope

Recent data on maternal and perinatal mortality tabulated by social and demographic factors were gathered and analysed to determine social inequalities in vulnerability to maternal and perinatal death. Maternal mortality data are provided by the most recent Confidential Enquiry into Maternal and Child Health (CEMACH) review of maternal deaths in the UK, 2003-05.¹ Data from the Office for National Statistics (ONS) are used for perinatal mortality,² as well as select data from the CEMACH perinatal mortality report, 2006.³ Additional data on socio-demographic and behavioural indicators were sought, mostly from the ONS, to explore correlations of social factors.

It should be acknowledged that evidence of social inequalities is greater for infant deaths than perinatal deaths,² demonstrating that the wider environment has a greater impact in the post-neonatal period. However, perinatal mortality is the chosen indicator for

deaths of babies in this paper because analyses are available for perinatal mortality rates by area deprivation scores and maternal obesity, which are not available for infant mortality rates.

As already mentioned, it was not always possible to use data that are applicable to the entire UK due to lack of availability. There are also issues of data consistency and quality, and it is not always possible to use data for the same time period. Even though all maternal mortality data in this paper are taken from the CEMACH UK maternal mortality report, some analyses are restricted to England, or England and Wales. When data are presented, the country or countries they relate to and the time period are given.

Definitions

Maternal deaths, according to UK legislation, are deaths of women while pregnant or within 42 days of the end of pregnancy, from any cause related directly to pregnancy (direct deaths) or aggravated by the pregnancy (indirect deaths), but not from unrelated causes which happen to occur during this time (coincidental deaths). The maternal mortality rate is the sum of direct and indirect deaths per 100,000 maternities. Late deaths (indirect and direct deaths occurring between 42 days and one year after the end of pregnancy), coincidental deaths and late coincidental deaths are not formally classified as maternal deaths but are included in CEMACH's review of maternal deaths and also, therefore, in this paper.¹

The perinatal mortality rate, according to UK legislation, is the number of still births (babies delivered without life after 24 completed weeks of pregnancy) and early neonatal deaths (deaths of live born babies occurring before seven completed days after birth) per 1,000 live births and stillbirths.³ The infant mortality rate is the number of deaths of live born babies occurring before a year after birth per 1,000 live births.²²

Further explanation of mortality definitions is provided in Boxes 1 and 2.

Marital and birth registration status and social class

Maternal and perinatal mortality data show that death rates are very strongly associated with marital and birth registration status and with social class. These factors are examined together because they are inter-dependent and linked by classification methods. Social

Box 1: Definitions of maternal deaths

Maternal deaths*

Deaths of women while pregnant or within 42 days of the end of pregnancy, from any cause related to or aggravated by the pregnancy (direct deaths) or its management (indirect deaths), but not from accidental or incidental causes.

Direct deaths

Deaths resulting from obstetric complications of the pregnant state (pregnancy, labour and puerperium), from interventions, omissions, incorrect treatment or from a chain of events resulting from any of the above.

Indirect deaths

Deaths resulting from previous existing disease, or disease that developed during pregnancy and which was not due to direct obstetric causes, but which was aggravated by the physiologic effects of pregnancy.

Late deaths*

Deaths occurring between 42 days and one year after abortion, miscarriage or delivery that are due to Direct or Indirect maternal causes.

Coincidental deaths*

Deaths from unrelated causes which happen to occur in pregnancy or the puerperium (up to 42 days of the end of pregnancy).

Maternal mortality rate (according to UK legislation)

Direct and Indirect maternal deaths per 100,000 maternities.

** Late deaths, Coincidental deaths and Late coincidental deaths are not formally classified as maternal deaths and are therefore not included in the calculation of the maternal death rate, but they are included in CEMACH's review of maternal deaths and analysis in this paper.*

Source: Adapted from CEMACH (2007)¹

classes are derived from the occupation of the baby's father, and so cannot be used to analyse perinatal deaths for solely registered

Box 2: Definitions of deaths in babies

Stillbirth (according to UK legislation)
A baby delivered without life after 24 completed weeks of pregnancy.

Early neonatal death
Death of a live born baby occurring before seven completed days after birth.

Perinatal mortality rate (according to UK legislation)
Number of stillbirths and early neonatal deaths per 1000 live births and stillbirths.

Infant mortality rate
Number of deaths of live born babies occurring before a year after birth per 1000 live births.²²

Source: Adapted from CEMACH (2008)³

births. For maternal mortality, CEMACH data provide some limited class analysis for women without partners.

ONS perinatal mortality data for England and Wales in 2006² are analysed using the eight-tier National Statistics Socio-Economic Classification Classes (NS-SEC) system shown in Table 1. This official classification system was introduced in 2001 and differs from that used for official statistics and surveys prior to this date.²³ The classifications are designed to distinguish between different positions and forms of employment defined by relations and conditions in the workplace, encompassing degrees of authority and autonomy. The system is designed to be non-hierarchical and not based on skill levels. While there is a form of hierarchy between classes 1-2 and 5-8, the middle of the scale does not follow a social gradient.²³ CEMACH maternal mortality data for England and Wales in 2003-05 use a simplified hierarchical three-tier version of this classification system, grouping classes 1 and 2, 3 and 4, and 5-7 in the table below which are categorised as 'Managerial and professional', 'Intermediate' and 'Routine and manual'.^{1,23}

Maternal mortality

The maternal mortality data show that women without a partner (a term used

Table 1: National Statistics Socio-Economic Classification Classes (NS-SEC)

| Class | Occupation |
|----------------|--|
| 1 | Higher managerial and professional occupations 1.1: Large employers and higher managerial occupations 1.2: Higher professional occupations |
| 2 | Lower managerial and professional occupations |
| 3 | Intermediate occupations |
| 4 | Small employers and own account workers |
| 5 | Lower supervisory and technical occupations |
| 6 | Semi-routine occupations |
| 7 | Routine occupations |
| 8* | Never worked and long-term unemployed |
| Not classified | Students and unclassifiable occupations |

* When publishing mortality statistics, it is common for class 8 and the 'not classified' group to be grouped together as a separate group termed 'other', which is the case for the data presented in this section. The 'other' group is very heterogeneous with relatively small numbers and therefore caution should be taken when drawing conclusions from it.
Source: ONS23.

informally by CEMACH and not defined) were three times more likely to die than those with a partner (maternal mortality rates 38.6 vs. 12.7). Yet this comparison hides complexities associated with social class and the employment status of partners.¹ Unlike the situation in developing countries, maternal deaths are now rare in the UK and there are no significant differences by social class for women whose husband or partner is employed. There was, however, an increased risk for women whose husband or partner is unemployed or in an unclassified occupation. The maternal mortality rate for this group was 68.5, over seven times higher than the rate for all women with partners in employment (9.2) and considerably higher than that for women without a partner (38.6). However, women without a partner were more than four times more likely to die than those with a partner in employment (maternal mortality rates of 38.6 vs 9.2).¹

Perinatal mortality

Perinatal mortality varies by marital and birth registration status and social class. More detailed analysis of perinatal mortality by class and relationship factors is possible than for maternal mortality as the numbers are much larger and ONS birth registration data are used with four different categories of relationship. The perinatal mortality rate was highest for sole registered births (10.1), followed by joint registration by couples living at different addresses (8.9), then by joint

registration by couples living at the same address (8.3). The lowest rates were found inside marriage (7.3).² It is important to acknowledge however, that differences between these categories may also reflect the social class and age differences which influence marriage and living arrangements.

For social class, the perinatal mortality rate of babies with married parents and their father in the 'routine' occupations group (9.7) was over double the rate of babies with their father working for 'large employers and (in) higher managerial occupations' (4.7). It was highest for babies with fathers in the semi-routine group (11.7), followed by the 'other' group: unclassified occupations or unemployment (11.3). Among jointly registered births to unmarried parents, perinatal mortality for fathers in the 'routine' group (9.7) was higher than for fathers in the 'large employers and higher managerial occupations' group (7.4), although the difference was not as great as within marriage. The highest rate was for babies with fathers in unclassified occupations or unemployment (12.5).²

There are also social class differences associated with differences in low birthweight and preterm birth.²⁴⁻²⁷ The incidence of low birthweight is highest amongst women with partners in manual or unclassifiable occupations or unemployment.²⁸ The CEMACH report on perinatal deaths in England, Wales and Northern Ireland in 2006 found that over two thirds (68%) of all perinatal deaths were of babies of low birth-

weight (less than 2500g) compared with a low birthweight rate of only 7.5% in live births. Perinatal deaths were also higher for babies who were preterm (born before 37 weeks).³

Area deprivation

CEMACH data for maternal and perinatal mortality both show a strong association with area deprivation scores in England and are highest in areas of high deprivation^{1,3} The data use the Index of Multiple Deprivation 2004 which includes data on seven aspects of deprivation that can be experienced by individuals living in deprived areas, relating to: employment, health and disability, education, skills and training, housing and services, living environment and crime.²⁹ At a group level, area deprivation scores are useful; however, wide social disparities exist between different individuals residing in the same area.

Maternal mortality

Data for England in 2003-05 show that mothers living in the most deprived areas quintile (fifth) were around five times more likely to die than those in the least deprived quintile (maternal mortality rates of 23.8 vs 4.7).¹

As many as 10 percent of all women who died during pregnancy or within a year of giving birth lived in families known to the child protection services, and these frequently also involved psychiatric or substance abuse problems and / or domestic abuse. Further demonstrating the cumulative effect of deprivation, in addition to experiencing multiple personal problems, women from deprived areas and backgrounds had often not accessed the care they needed, in terms of booking for antenatal care early and attending regularly,¹ which will be discussed in greater depth in a later section. CEMACH uses the term 'socially complex' deaths to describe the many maternal deaths of women who had multiple social difficulties and disadvantages which contributed to their deaths.¹

Perinatal mortality

Data for England in 2006 show that babies born to mothers living in the most deprived areas quintile were 1.8 times more likely to die perinatally than those in the least deprived areas quintile (perinatal mortality rates of 9.3 vs 5.3).³

Ethnicity

An analysis of maternity data by ethnicity provides perhaps the most stark illustration of the impact of socio-demographic factors upon pregnancy outcomes. The perinatal mortality rates by ethnicity presented here use the mother's ethnic group but earlier this year the ONS published for the first time infant mortality data by babies' ethnic group.³⁰ These new data are not presented in this paper because they do not include perinatal mortality rates but further information and infant mortality rates by babies' ethnicity are included in Box 3.

It should be noted that analyses by ethnicity do suffer data collection and consistency issues. Record keeping of mothers' ethnic group in case notes is not complete and there are problems with the coding of ethnic groups. For these reasons, and particularly for the maternal mortality data because the analyses rely on relatively small numbers, the data should be considered as approximate.¹ Nonetheless, the data show that ethnic minority women and their babies suffer considerably poorer outcomes in comparison to white or UK-born women. CEMACH maternal mortality data by ethnicity are restricted to England only in 2003-05¹ and the ONS perinatal mortality data are for England and Wales in 2006.² Ethnic groupings vary between the two sources.

Maternal mortality

Black African women had the highest rate of maternal mortality and were almost six times more likely to die than white women (62.4 vs 11.1). This group included many women who were refugees, asylum seekers or newly arrived migrants. The second highest maternal mortality rate was for Black Caribbean women (41.1), almost four times the rate for white women, followed by Middle Eastern women (32.0). Women of Indian and Bangladeshi origin also had considerably higher maternal mortality rates than white women.¹

Perinatal mortality

Perinatal mortality also shows great variation by ethnic group. ONS data by mother's country of birth show that babies of women born in countries in the 'Rest of Africa' group (predominantly West African countries) had the highest perinatal mortality rate; over twice the rate for UK-born women (15.4 vs. 7.4). Babies whose mothers were born in the

Box 3: New infant mortality data by babies' ethnic group

Infant mortality data by babies' ethnic group were published in June by the ONS.³⁰ These data for babies born in England and Wales in 2005 show large differences in infant mortality rates of ethnic groups. Infant mortality was highest for babies of Caribbean ethnicity (9.8 deaths per 1,000 live births), followed by Pakistani babies (9.6). The rate for these groups was over double that for the White British group (4.5). Pakistani babies were more likely to die due to congenital anomalies than White British babies, and babies of Caribbean ethnicity were more likely to die due to low birthweight and prematurity-related conditions.³⁰ Additionally, the ONS has since published data on gestational age, birthweight, social class and birth registration by babies' ethnicity.

This is the first time that the ONS has published infant mortality data by babies' ethnic group as defined by mother, rather than by mother's country of birth. The new data include larger and more clearly defined ethnicity categories. Ethnicity information is not collected at birth or death registration but is now available for babies in England and Wales, as well as gestational age data, from the Central Issuing System that issues NHS numbers (NN4B) for babies.³⁰

The data are available from:

- <http://www.statistics.gov.uk/StatBase/Product.asp?vlnk=15111&Pos=1&ColRa>
- http://www.statistics.gov.uk/articles/hsq/HSQ39Birthwt&Gest_ethnicity.pdf

Caribbean Commonwealth countries had the second highest rate (14.1, 1.9 times the rate for UK-born women), followed by those born to women born in Pakistan (13.2, 1.8 times greater). Babies whose mothers were born in East Africa (12.0), Indian (10.8), Bangladesh (9.3) and Southern Africa (8.0) also had perinatal mortality rates that were greater than those born to UK-born women (7.4).²

The new ONS data by babies' ethnicity for England and Wales in 2005 show that babies

of African, Caribbean, Bangladeshi, Indian and Pakistani ethnicity had lower average birthweights and lower average gestational ages than babies of white ethnicity.³¹ This contributes to the high perinatal mortality rates for these groups. Additionally, a high proportion of very low birthweight babies (less than 1500g) and very preterm babies (born before 32 weeks) are of African and Caribbean ethnicity.³¹ Amongst mothers born in the Caribbean and West Africa, incidence of low birthweight babies are also higher outside of marriage.²⁴ Caribbean and West African-born women are also more likely to have multiple births²⁴ which is associated with higher risk of adverse perinatal outcome³ and Pakistani mothers are more likely to have babies that died of congenital anomalies.^{32,30}

The considerably greater risks of adverse outcomes for pregnant women and babies from ethnic minorities can be explained in part by deprivation, social exclusion and the poorer general health of women born outside of the UK.¹ The UK Millennium Cohort Study found that mothers from all ethnic minority groups, and particularly women of mixed or Black Caribbean ethnicity, were more likely to be living in a household with low income than white mothers. Mothers from all ethnic minority groups were also more likely than white mothers to have no qualifications, although there were variations between ethnic minority groups for both income and educational attainment.³³ ONS data for England and Wales in 2005 show that fathers of babies born inside marriage or jointly-registered of Bangladeshi, Pakistani, African and Caribbean ethnicity were less likely than fathers of babies of white ethnicity to be in 'managerial and professional' occupations.³¹ Births of babies of African and Caribbean ethnicity were also more likely than those of all other ethnic groups to be registered solely.³¹ It is not clear from the mortality data whether variations in mortality associated with ethnicity are entirely attributable to differences in social class and deprivation or whether they also arise independently from clinical problems which can be more prevalent in some ethnic groups than in others.

Residency status

There are no data to directly compare the pregnancy outcomes of refugees, asylum seekers and newly arrived migrants with women with permanent residency in the UK.

While migration and asylum statistics are insufficiently robust to allow detailed comparative analysis, the effect of excluding maternal deaths to refugees and asylum seekers from analyses in the previous three triennial (three year period) CEMACH maternal mortality reports shows slightly lower, although non-statistically significant, maternal death rates. In 2003-05 deaths of refugees and asylum seekers made up 12% of all direct and indirect maternal deaths.¹ The issue of current inadequacies with UK asylum, migration and migrant maternity statistics will be addressed in an article by Alison Macfarlane in a future issue of *New Digest*. In this section, the reasons why women with insecure residency status are, as a group, likely to have higher maternal and perinatal mortality rates will be discussed.

The problems that can be experienced by black and minority ethnic groups as a result of their socially and economically marginalised status are exacerbated for those with uncertain residency status. Refugees and asylum seekers commonly face severe deprivation and impoverished living conditions which are likely to contribute to poor health outcomes. Studies of the experiences and well-being of asylum seekers in the UK show that the support and entitlement system does not provide adequate food or shelter for pregnant women and mothers.^{34,35} The situation is even worse for asylum seekers who have had their applications for asylum refused but remain in the UK. They are not allowed to work and within 21 days they have all accommodation and financial support withdrawn and are therefore destitute without the means to meet their basic needs. It is not uncommon for women in this situation to be pregnant or accompanied by children.^{36,37} Another factor that can increase the vulnerability of refugees and asylum seekers is that they may be survivors of rape, torture and other forms of sexual abuse, from which they can suffer psychological effects.³⁸ This is discussed in the CEMACH report, as well as cultural practices or attitudes of male partners which can lead to women not receiving the care they need.¹

Accessing care can be a major problem for refugees, asylum seekers and newly arrived migrants. Guidance on the charging of 'overseas visitors' for health care across the UK deems maternity care 'immediately necessary'. As such it should not be withheld in any circumstances, though some women

can be charged following treatment.³⁹⁻⁴³ Yet due to fear about being asked to pay for services and lack of awareness or confusion about payment rules, refugees and asylum seekers may not access the services they need, putting them at more risk of serious pregnancy complications, and maternal and infant mortality and morbidity.^{44,45} In addition there have been cases where women have been incorrectly denied maternity care by service providers.^{46,44}

Entitlement and charging issues are not considered by CEMACH in relation to maternal deaths of these women but at least one of the maternal deaths examined by CEMACH may have occurred due to changing issues.⁴⁷ A woman who had recently arrived in the UK requested an abortion and was referred for a termination, but for unknown reasons had an illegal unsafe termination and subsequently died from complications. The report speculates that that 'there may have been cultural issues, or coercion' that made her opt for an unsafe abortion.¹ Yet because abortions are not classed as immediately necessary care and can be refused if a woman is unable to pay, it could have been that the woman was asked to pay for the abortion and was unable to.⁴⁷

Language

Language and communication difficulties are associated with further risk and provide an additional barrier to accessing care. The CEMACH maternal mortality enquiry found that translation services were sometimes not available when needed and a relative acted as a translator instead. This left women embarrassed to disclose important yet intimate information, or resulted in misinformation or in details being withheld.¹ A survey of women's experiences of maternity care in England in 2006 shows that there are more communication problems for women from ethnic minorities who do not speak English than for other women. These women were more likely to report that maternity staff communicated with them in a way that they did not understand, and less likely to report being treated with respect and in a supportive and sensitive manner.⁴⁸ Likewise, the maternal death enquiry notes that there were: 'culturally dismissive or insensitive remarks made [to the assessors] by a few health professionals during the course of the reviews'.¹ More worryingly, a survey of the maternity experiences of asylum seekers in

England found that many of the women interviewed had experienced 'indifference, rudeness and racism' from health professionals whilst in labour or postnatally.³⁴ Negative interactions with staff will further discourage these women from seeking care.

Maternal age

As in previous years, in 2003-05 the highest rates of maternal mortality were found amongst older mothers.¹ Women aged 40 and over had the highest rate (29.4) followed by women aged 35-39 (19.1) in comparison to the rate of 14.0 for all ages.¹ Yet higher mortality rates for older mothers are due to causes unrelated to social inequalities and having children at an older age is not associated with social disadvantage.⁴⁹ Young maternal age is not a risk factor for maternal mortality.¹

The highest rates of perinatal mortality were found among babies born to older and young mothers.^{2,3} ONS data for England and Wales in 2006 showed that mothers aged 40 and over had the highest rate (12.0), followed by mothers aged below 20 (8.8). Yet for infant mortality, mothers under 20 had the highest rate (6.4), followed by mothers aged 40 and over (5.9).² For sudden infant death syndrome (SIDS), older maternal age is not a risk factor and the rate was lowest amongst older mothers. ONS data for England and Wales in 2003 show that mothers aged below 20 had the highest rate, close to double that of the general population (0.52 vs 0.28). This difference may in part reflect the social class differences associated with SIDS and in relative terms the risk of SIDS is still low.⁵⁰

As older mothers tend to come from more advantaged social groups, this will not be examined further, but teenage pregnancy is strongly associated with social disadvantage and is therefore of relevance. This is demonstrated by the distribution of under-18 conceptions. In 2006, under-18 conceptions in England were more than twice as high in the most deprived quintile of local authority districts as in the least deprived quintile (53.4 vs 24.1).¹⁹ Bangladeshi and black women are significantly more likely than white women to become mothers during their teens. Between 1990 and 1996, teenage birth rates in Britain for these women were 53, 47 and 31 per 1,000 respectively.⁵¹ Teenage mothers were far more likely to be lone parents than older mothers, with 25% of births to teenage moth-

ers solely registered, compared with 6% overall.²² White and Caribbean teenage mothers were most likely to face the additional disadvantage of being a single parent, while it is more common for births to South Asian teenage mothers to occur inside marriage.⁵¹ There were also strong correlations between teenage pregnancy and smoking.⁵² The extent to which high perinatal mortality for teenage mothers is associated with social class differences, or with a combination of social class and behavioural differences, is not clear from the perinatal mortality data.

Smoking

Maternal and perinatal mortality rates cannot be tabulated by smoking prevalence during pregnancy as data are not available, yet the increased risks are well documented. Smoking during pregnancy increases the risks of prematurity and low birth-weight^{26,53,27} and SIDS.^{54,55}

Smoking during pregnancy is strongly associated with young maternal age and manual social class, as shown by the 2005 UK *Infant Feeding Survey*.⁵² Mothers aged 20 and under were five times more likely to have smoked throughout pregnancy than women aged 35 or over (45% vs 9%). Mothers in routine and manual occupations were four times more likely to smoke throughout pregnancy than women in managerial and professional occupations (29% vs 7%). Young mothers and those in routine and manual occupations were also less likely to have given up smoking before or during pregnancy.⁵² These findings demonstrate a clear link between socio-demographic and behavioural factors and the cumulative effect of disadvantage.

Maternal obesity

There are links between obesity and indicators of social inequality. *Health Survey for England 2003* data shows obesity to be more prevalent among women in manual social classes (28%) than in non-manual social classes (19%).⁵⁶ Data from the same survey in 2004 shows the prevalence of obesity to be higher in Black African women (38%) and Black Caribbean women (32%) than in the general population (23%).⁵⁷ *Saving Mothers' Lives* comments that: 'obesity represents one of the greatest and growing overall threats to the childbearing population in the UK'.¹

Maternal and perinatal mortality rates by

BMI (Body Mass Index) are not available but there are data from CEMACH on BMI of women who died and mothers of babies that died. These show that a large proportion of these women were obese. Twenty-seven percent of all indirect and direct maternal deaths in the UK in 2003-05 for which a BMI was available were of women who were obese (BMI of 30 and over).¹ There are no data on BMI of pregnant women amongst the general population but obesity levels amongst women of childbearing age (16-44) in England in 2006 were 19%.⁵⁷ Eight percent of the women who died from indirect and direct maternal deaths were morbidly obese (BMI of 40 or over),¹ compared with morbid obesity levels of 1% amongst the general population of women of childbearing age in England in 2006.⁵⁷

Problems that obese women can encounter during pregnancy detailed in *Saving Mothers' Lives* include maternal death or severe morbidity, cardiac disease, thromboembolism, pre-eclampsia, post-partum haemorrhage, gestational diabetes, and infection. Additionally there can be difficulties in providing maternity care for obese women including accurate prenatal diagnosis and administration of analgesia and anaesthesia.¹ The CEMACH report was critical of the care received by some of the obese mothers who died, for whom there had been no explicit care plan for the birth and a lack of risk assessment.¹

The CEMACH perinatal mortality enquiry found that 25 percent of all perinatal deaths in England, Wales and Northern Ireland in 2006 were among babies born to obese women.³ This rate is higher than the rate of obesity in the general childbearing population in England (19%),⁵⁷ though there may be higher numbers of births than average to obese women. The perinatal mortality rate is likely to be greater for women with a BMI of 40 but to an unknown extent. As for maternal deaths, CEMACH data cannot demonstrate increased clinical risks associated with obesity but these may include stillbirth and neonatal death, congenital abnormality and prematurity.¹

Mental health in pregnancy

The CEMACH enquiry into maternal deaths in the UK between 2003 and 2005 provide data showing links between maternal mortality, mental health problems and other social factors. In total, 17% of all direct, indirect and

late deaths were due to, or associated with, psychiatric causes.¹ Suicide was the leading indirect cause of maternal death in the 2003-2005 period,¹ and the leading overall cause of maternal and late deaths in the previous triennium.⁴ In the latest report, 6% of all the women who died (including late deaths and 'coincidental' deaths), were thought to have committed suicide. Two thirds of these suicides (25 in total) were late deaths and are therefore not included in the maternal death rate yet 'all but three of these later deaths were considered to be directly due to a postnatal mental illness'. A 'past psychiatric history' was found to be a significant risk factor for maternal death. Eighty-one percent of all deaths due to or associated with psychiatric causes and 64% of all deaths by suicide were of women with a 'previous history of psychiatric disorder'.¹

Of the women who died from suicide, 55% were unemployed and / or had a partner who was unemployed, 42% were living with domestic abuse and 36% were drug addicts or occasional users. Perhaps as a consequence of this, 30% booked for maternity care after five months gestation or were irregular attenders for care.

CEMACH reviews deaths associated with use of alcohol and illegal substances alongside maternal deaths arising directly from a psychiatric condition or closely related to a psychiatric disorder and suicide. Eleven percent of all women who died had drug or alcohol problems, and 60% of these women were registered drug addicts.¹

There are no routine data available about associations between mental health problems during and after pregnancy and perinatal mortality and morbidity.

Domestic violence

Saving Mothers' Lives shows that 14% of all the women who died had reported that they were subjected to domestic violence; however, because of the potential for under-reporting, the actual number is likely to be higher. At least 20 women were murdered, the majority by their partner.¹ Domestic violence is known to be associated with pregnancy, commonly escalating, and sometimes beginning, at this time.^{58,59} Yet maternal deaths known to be directly as a result of domestic violence are classified as coincidental by CEMACH, according to the WHO International Classification of Diseases, because they cannot be directly attributed to

pregnancy.

The consequences of domestic violence during pregnancy and the postnatal period can be severe and sometimes fatal for both mother and child. In addition to the usual physical and psychological effects of domestic violence, abuse during pregnancy is associated with increased risk of miscarriage, prematurity, babies with low birthweight or injury, poor maternal mental health, maternal death, fetal death, uterine rupture, haemorrhage and other gynaecological and maternal complications.^{60,1,61-64} The risk of poor pregnancy outcomes are heightened further because abuse acts as a barrier to women receiving and attending regularly for care.^{1,65,61,63}

The CEMACH maternal mortality enquiry noted that many of the women whose deaths were associated with domestic violence booked late or attended for care infrequently, had an 'overbearing' partner present at all visits or were known to social services. Physical signs of domestic violence observed were admittance or regular attendance at clinics or emergency departments for non-specific abdominal pain or vague aches and pains; and having a history of sexually transmitted diseases, multiple miscarriages or unexplained vaginal bleeding. All of the women who were murdered had at least two of these identifiable characteristics and in many cases visible symptoms. Yet these were not acted upon by healthcare professionals and it is thought that none of these women were referred for help or advice.¹

Although there is no evidence to suggest that prevalence of domestic violence varies by social class,^{66,65} CEMACH found links between domestic violence and other factors associated with social inequality. Women known to social services, women who had been in prison, sex workers and women who did not speak English were amongst those murdered, providing a picture of the severe vulnerability and often tragic circumstances of these women. Over 40% of the women who died of suicide were 'living with domestic abuse'.¹

Some of the deaths of refugees and asylum seekers examined by the maternal mortality enquiry were linked to specific sexual and cultural forms of violence. At least four of the women who died had undergone female genital mutilation, four had been raped by soldiers during war in their home country and others had been trafficked into the UK for prostitution. These women commonly spoke

little or no English and did not know where to seek help; a situation exacerbated by fear about their immigration status and feelings of shame related to their experiences of sexual assault and exploitation. Five of the murdered women spoke little or no English, and the perpetrator of their death acted as a translator, preventing the woman from seeking help.¹

Poor access to care

It is well known that those most likely to experience problems in pregnancy are the least likely to access the care that they need.^{16,1,18} Of all maternal deaths in the UK in 2003-05, 17% of all women who died from direct or indirect causes booked for maternity care after 22 weeks gestation, missed over four routine antenatal appointments, or did not seek care at all. Key characteristics identified for poor or non-attendance were being subject to domestic violence or being known to social services, having substance misuse problems, being single, unemployment of the mother or both partners, and speaking no English. A low attendance rate among Black African women reflects the extent to which many of these women were refugees and asylum seekers.¹

In most cases, women who were known to be high risk yet missed appointments had not been followed up, as recommended in previous enquiries.^{1,4} From 2007, this is explicitly addressed in England by *Public Service Agreement 19* which aims for all women to access maternity care and receive a risk assessment and care plan by 12 completed weeks of pregnancy.^{20,16} This agreement should focus attention on the specific needs of vulnerable women, and encourage services to respond to their diverse and specific needs.

Substandard care

CEMACH's *Saving Mothers' Lives* report assessed 64% of direct maternal deaths in the UK in 2003-05 and 40% of indirect deaths to have been of women who received some degree of substandard care. As has been shown, a disproportionate number of the women who died during pregnancy or the postnatal period were from vulnerable and excluded social groups. Additionally, poor management of higher risk women and a lack of multidisciplinary care for women with complex pregnancies was identified as a frequent contributor to substandard care. Poor

communication was also found to be an underlying cause of substandard care, and particularly a lack of information sharing between different teams of professionals, including GPs, the maternity team and social services.¹ These inadequacies are likely to have most impact on women whose circumstances put them at greater risk of multiple physical, mental health and social problems and who are most in need of multi-disciplinary and multi-agency care.

Of the women who died, CEMACH identified a serious multi-agency communication problem for women whose children had been taken into care, often as a result of substance misuse. Lack of follow-up of these women after their child had been taken away, and a lack of liaison and co-ordinated care between health and social services was apparent in many cases. In total, 23 women died after removal of their child by social services. Five of these died as a result of suicide, 18 as a result of drug overdoses which could not be proved or disproved as intentional, and one as a result of murder. Women often tried to hide their pregnancies and actively avoided maternity care due to fear of their child being taken from them. When their pregnancies were known about by social services it was commonly wrongly assumed that the women were accessing maternity care.¹

While these findings suggest that socially disadvantaged women may be more at risk than others of receiving substandard care, there is very limited available evidence and analysis on substandard care and social inequalities. Unfortunately the annual CEMACH perinatal mortality reports do not provide data on substandard care and CEMACH perinatal death reports and patient safety literature as a whole have been criticised for a 'missing social inequalities lens'.⁶⁷

Conclusion

Data presented in this paper demonstrate a strong association between social inequality and maternal and perinatal mortality. Disadvantaged women are often exposed to multiple adversities, such as poverty, language and communication difficulties, lack of a supportive partner and late or infrequent access to antenatal care, thus heightening their vulnerability. Maternal and perinatal deaths are commonly examined separately, yet there are patterns of social vulnerability to these deaths which are shared.

Poverty, deprivation and social marginalisation factors contribute to the high mortality rates for women and babies in some ethnic minority groups. This can be most extreme for refugees and asylum seekers but the weaknesses in UK migration and migrant maternity statistics need to be addressed before the full impact on maternity outcomes for these women is known. The current system of entitlement to NHS care is discouraging refugees and asylum seekers from seeking antenatal care.^{44,45} The charging and entitlement system needs to be changed, as well as the negative attitudes of some health professionals,³⁴ to prevent further isolation of these women.

Women who experience domestic violence are another group at considerable risk of maternal and perinatal mortality, yet one that is neglected by health inequality literature. Most of the women identified by CEMACH in 2003-05 whose deaths were related to domestic violence had self-reported their abuse to a health care professional at some point before or during pregnancy and all had at least two identifiable characteristics of domestic violence. Yet none of these women were thought to have been referred for help.¹ This shows there is substantial scope for improvement in care to prevent the deaths of women suffering domestic violence, and the deaths of their babies.

Saving Mothers' Lives emphasises the need for midwives to recognise the deprived and complex circumstances that many women face. It emphasises the importance of identifying women's individual needs and providing targeted and appropriate care, including active follow up of women who miss appointments.¹ Evidence that vulnerable women begin antenatal care later and experience difficulties staying in contact with maternity services demonstrates the need for more outreach services, based in communities close to where women live. Additionally, individual midwifery caseloads would allow women and their carers to get to know each other and build a trusting and mutually respectful relationship. The NCT welcomes the PSA agreement in England which sets a target for all women to have their individual needs assessed and start their antenatal care by 12 weeks.²⁰ With appropriate primary and secondary care for vulnerable women and improvements in multi-agency working this should have a positive impact on the quality of care provided.

Key points

- Women with a partner who was unemployed or in an unclassified occupation had the highest maternal mortality rate and were over seven times more likely to die than women with partners in employment.¹
- Women without a partner (irrespective of social class) were three times more likely to die than women with a partner.¹
- Perinatal mortality was considerably higher for babies with fathers in 'routine' occupations than for babies with fathers working for 'large employers and (in) higher managerial occupations'.²
- Perinatal mortality was highest for solely registered births, followed by births registered jointly by unmarried parents and lowest for births registered by married parents. For births registered jointly by unmarried parents perinatal mortality was lower when parents lived at the same address.²
- Black African women had the highest maternal mortality rate of all ethnic groups. The high proportion of refugees and asylum seekers in this group contributed to this.¹
- Women born in the 'Rest of Africa' country group (predominantly West African countries) had the highest perinatal mortality rate; over twice the rate for UK-born women.² The incidence of very preterm birth and very low birth-weight is high amongst babies of African ethnicity.³¹
- Mothers living in the most deprived areas quintile were about five times more likely to die than those in the least deprived quintile.¹
- Babies born to mothers living in the most deprived areas quintile were 1.8 times more likely to die stillborn or in the first week of life than those in the least deprived quintile.³
- Perinatal mortality was higher for babies of teenage mothers and for those born to women aged 40 and over.²
- Women from socially disadvantaged groups were more likely to have complex needs yet were less likely to access and receive the care they required. Seventeen percent of all direct or indirect deaths were of women who booked late, were irregular attenders for care, or did not seek care at all.¹

Furthermore, it is imperative that interventions are informed by the findings and recommendations of CEMACH enquiries and evidence on best practice for the care of pregnant women with specific and complex needs.

Demographic changes, including increasing numbers of births to women born outside the UK and growing obesity levels, look to further exacerbate health inequalities. The challenges this poses for public health cannot be met by the healthcare system alone but necessitate a broader public policy response to health inequalities. This requires an increased multi-sectoral, collaborative approach in order to design and implement policy which address the social factors influencing health and underlying vulnerability.⁶⁸

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(Please note, an electronic version of this paper is available from the NCT Library and Information Service that includes web links to references.)

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