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Scientific Impact Paper No. XX
Fourth Draft – July 2021 (v4.4)

New Title: Understanding the relationship between social determinants of health and maternal mortality.

Note from RCOG Guidance Editorial Manager: Please ignore the formatting of the references for now

GL Jones, C Mitchell, J Hirst, DOC Anumba, on behalf of the Royal College of Obstetricians and Gynaecologists

Correspondence: Royal College of Obstetricians and Gynaecologists, 27 Sussex Place, Regent's Park, London NW1 4RG.
Email: clinicaleffectiveness@rcog.org.uk

Plain language summary

This paper aims to inform those involved in the care of pregnant women in the UK about the relationship between social determinants of health and the risk of maternal death. Social determinants are the social conditions in which people are born, grow, live, work and age. These conditions can shape a person's health, their exposure to illness and access to care. The worse social and economic positions people are in, the worse their health outcomes are likely to be.

Exploring these issues in relation to maternal outcomes is timely because the profile of mothers giving birth in the UK is changing. Increasingly, babies are being born to older or obese mothers, or to women born outside of the UK.

The evidence suggests a strong relationship between social determinants and poor maternal outcomes, including an increased risk of maternal death. Despite the provision of free reproductive and maternity services, current models of care are still failing those pregnant women that have lived in adverse social circumstances prior to, during and after pregnancy. The reasons are complex but maternal outcomes are particularly poor for socially disadvantaged women affected by pre-existing physical or mental health problems, those who misuse substances, have a low level of education, are overweight, undernourished or poorly sheltered, and those who are at increased risk due to the threat of abusive and unsupportive partners, families and peers. Some traditional, cultural and social norms, and reproductive laws and policies, also appear to influence a pregnant woman's relationships, behaviour and access to healthcare services. These factors can reinforce a web of social disadvantage and poor outcomes for some pregnant women, which can persist for future generations. These issues have been brought into public awareness as a result of the Covid-19 pandemic which has highlighted the ways that health inequalities can adversely affect health outcomes beyond an individual's control. However, addressing the relationship between Covid-19 and social determinants of health is outside the scope of this paper. Whilst social determinants of maternal health also have an impact on offspring health, this is outside the remit of this paper too.

Healthcare professionals have limited power on their own to modify social determinants of health, but this paper concludes with current recommendations to improve the maternal outcomes of vulnerable pregnant women residing in the UK and proposes improvements to the collection and reporting of maternal outcome data, with further investment in prevention and intervention measures to better support these women.

1. Background

This paper aims to improve understanding concerning the relationship between social determinants of health and maternal outcomes. Social determinants are the factors in the social environment that can shape a person's health, their propensity to illness and access to care. They are the social conditions into which people are born, grow, live, work and age[1] that contribute or detract from them being able to live a healthy life. Understanding the social determinants of health is a global and national priority. In March 2005 the WHO launched The Commission on Social Determinants of Health (CSDH) to support countries and global health partners in addressing the social injustice of health inequalities.[2] The evidence suggested that there is a clear social gradient, i.e. the more disadvantaged people are in terms of their social and economic position within society, the worse their health outcomes in terms of morbidity (suffering from a disease or condition) and mortality (death), which can persist through future generations and influence behaviour beyond an individual's control.[1,2] This is not a new phenomenon. Historical data has demonstrated the links between the social position of the poorest 'working classes' generally and their health outcomes.[3] The Marmot Review was commissioned by the British Government to identify how the WHO 2005 findings could be specifically applied to develop a strategy to reduce health inequalities in England, the outcome of which was 'Fair Society, Healthy Lives'.[1] This report acknowledged that the magnitude of health inequalities in England was still considerable, although less than in many other parts of the world. Overall, people from poorer areas die sooner and also live more of their shorter lives in worse health.

In the UK, over the last five three-year periods as reported by MBRRACE-UK, there has not been any significant change in the overall maternal death rate (including both direct and indirect causes of death).[4] In addition, since 2003 in each reported three-year period, more of these maternal deaths are as a result of indirect rather than direct causes. In the latest report at the time of writing (covering the years 2016–18 and published in December 2020), indirect causes account for 58% of maternal deaths.[4] Pre-existing medical and mental health comorbidities and factors contributing to health inequalities, such as obesity, smoking, substance misuse, poor utilisation of antenatal care, maternal age, unemployment and ethnicity, among others, have been identified as important risk factors associated with direct and indirect causes of maternal mortality.[5–8]

Whilst social determinants have been linked to both maternal morbidity and mortality, most of the evidence to date has focused upon maternal mortality which is at the end of the spectrum of all possible health impacts and is therefore the focus of this paper. This paper also primarily focuses on the UK and therefore draws upon data from the Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK (MBRRACE-UK) reports and the official National Statistics from the UK's Office for National Statistics (ONS). However, where UK evidence is lacking, it will also consider other national and international evidence, as defined by those countries in the Organisation for Economic Co-operation and Development (OECD) where healthcare is free at the point of delivery.

Finally, it is worth highlighting that the provision of maternity care in the UK is based upon a risk model of assessment, whereby the risk factors identified for a possible adverse pregnancy outcome are used to determine the care the pregnant woman receives. The complex causal pathways linking social determinants and maternal death are extremely difficult to disentangle with the current levels of evidence available. However, what is clear is that the risk factors associated with a poor maternal outcome presented below are typically outside of the woman's control and are often indicators of this social inequality and disadvantage.

2. Defining maternal outcomes and social determinants

Maternal deaths are defined by the WHO[9] and adopted by MBBRACE-UK[4] as follows:

- Maternal death refers to the death of a woman while pregnant or within 42 days (6 weeks) of termination of pregnancy (termination refers to the end of a pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes). This is further subdivided into two groups:
    - *direct obstetric deaths*: those deaths resulting from obstetric complications of the pregnancy state (pregnancy, labour and the puerperium), from interventions, omissions, incorrect treatment, or from a chain of events resulting from any of the above.
    - *indirect obstetric deaths*: those deaths resulting from previous existing disease that developed during pregnancy and which was not due to direct obstetric causes, but which was aggravated by physiological effects of pregnancy.

- Late maternal death refers to the death of a woman after 42 days (6 weeks) but less than 1 year post termination of pregnancy.

The World Health Organization (WHO) defines social determinants as the factors which can mediate an individual's living conditions, psycho-social circumstances, behavioural and biological factors and also access to health care. These factors can be at an individual (such as age, gender, pre-existing health conditions, family and interpersonal relationships), institutional or structural level [such as income, housing, occupation, education, environment, culture, political) and legal (migration and discrimination)]. Understanding the social determinants of health is a global and national priority as health outcomes are closely linked to living conditions, the quality of the social environment and the inequitable distribution of wealth, power and resources.[2]

Several frameworks have been proposed by the WHO to address the relationships between social determinants and health outcomes.[10-11] In 2011, a framework was proposed specifically in relation to maternal health (Appendix I).[12] We have used this framework to conceptualise how social determinants can contribute to maternal mortality in the UK. The framework outlines the intermediary and structural factors which may impact upon maternal health. It also places mothers within their families and social networks, both of which are considered the levels at which poor maternal outcomes are directly experienced.[12] However, for the purposes of this paper, the framework has been simplified to provide a model that considers risk factors and institutional and structural factors, which better fits with the risk model of assessment and the UK setting of maternal healthcare delivery. Also, in practice there is typically limited data upon which to provide a rigorous and robust analysis of all of these intermediary and structural factors and their relationship to maternal death, but the existing literature has been synthesised and appraised where possible.

3. Risk factors for adverse pregnancy outcomes and their links to social determinants

The following risk factors for possible maternal mortality are discussed below in the context of their links to social determinants.

3.1 Maternal age

The average age of mothers at childbirth in 2018 was 30.6 years, an increase of 4 years over the previous four decades.[13] The evidence suggests that mothers aged 35 years and older have a high

relative risk of maternal mortality. This was especially pronounced in mothers aged over 40 years, whereby the relative risk of maternal death was highest when compared with those aged 20–24 years during the MBRRACE-UK trienniums 2016–18 (RR 4.65; CI 2.48–8.89) and 2012–14 (RR 3.00; CI 1.51–5.83).[4] This is important since conception rates in women aged 40 years and older more than doubled between 1991 and 2018.[14]

Factors related to maternal aging, including a higher prevalence of pre-existing medical conditions and utilisation of assisted reproductive technologies, are associated with increased risk of maternal mortality. Yet the socio-economic position of older mothers is often better than in younger mothers.[15] Some of the reasons why women postpone childbearing until they are older include time spent in education to further career opportunities, workplace inflexibility and establishing financial independence.[16] However, the association between age, social inequality and maternal mortality is more complicated. In women over 35 years of age, smoking, pre-existing medical conditions, older maternal age, previous pregnancy problems and less use of antenatal care have all been associated with increased mortality.[17] Thus, whilst older mothers overall may be in relatively better social positions compared to younger mothers, social factors remain important drivers of maternal mortality in this group.

While young age alone is not a risk factor for maternal mortality in England and Wales, teenage pregnancies indicate a strong social gradient. There continues to be a welcome decrease in the conception rate for women aged under 18 years old.[14] However, young women from the poorest backgrounds are more likely to become teenage mothers than young women from affluent backgrounds. For example, in 2018, the conception rate for women under 18 years was higher in the 50% most deprived areas in England.[14] Conversely, the percentage of conceptions leading to a legal abortion was higher in the 50% least deprived areas in England. Teenage mothers are more likely to leave education, be unemployed, live in the most deprived areas and in poverty and be single parents compared with older mothers.[15,18] However, some research suggests that teenage parenting within marriage may not be perceived as a problem, or a distinctive event, particularly for young parents of Muslim faith.[19] Whilst the ONS does not report conception rates by ethnicity, a report in 2013, found mothers aged under 20 years old from Black Caribbean and White British backgrounds accounted for the highest percentage of teenagers giving birth in England and Wales.[20]

3.2 Parity

Parity refers to the number of times that a woman has given birth to a fetus with a gestational age of 24 weeks or more, regardless of whether the child was born alive or was stillborn. High parity is an important factor driving maternal mortality globally and is associated with lower socio- economic standing, but in developed countries such as the UK where family sizes are smaller, this is arguably less of a major contributor to mortality. The highest proportion of mothers who died from all causes between 2016–18 had one or two previous children (44%)[4] with 36% in their first pregnancy, a finding that has been relatively consistent since 2011.[4,21,22] This is to be expected as the average number of children born to mothers in the UK is 1.9. This, combined with the low absolute numbers of women who died with high parity, it is not possible to unpick the relationship between social determinants and this finding for UK data. Evidence suggests that Black, Asian and minority ethnic women are more likely to be multiparous and therefore more prone to obstetric haemorrhage, and worse maternal outcomes as a consequence.[23-25] However, in the UK, generally multiparity (having given birth two or more times) was recently shown not to be associated with death in women over 35-years of age.[17]

3.3. Pre-existing health conditions

Preconception health is important for subsequent maternal and child health. The results of a national unmatched case-control analysis using data from two sources, compared women who died from both direct and indirect causes from 2009–13 and women who did not have any life-threatening complications during pregnancy and childbirth. Case data was obtained from the Confidential Enquiry into Maternal Deaths and control data selected from the UK Obstetric Surveillance System (UKOSS). They reported an adjusted odds ratio of 8.65 (95% CI 6.29–11.90). This revealed that the odds of maternal mortality from direct or indirect causes was nearly nine-fold higher among women who had a pre-existing physical and mental health condition compared with women who did not.[8]

The latest MBRRACE-UK 2016-2018 report identified a pre-existing medical problem (excluding obesity) in 66%, of women who died during pregnancy or in the 6 weeks after birth (section 4.1 below) and 35% had a pre-existing mental health problem or psychiatric disorder (section 4.3 below).[4] Cardiac disease remains the leading cause of indirect death, and the rate has not significantly changed over the last fifteen years. However, the relationships that may exist between these conditions and the social determinants of health are complex and remain unclear.

Integration of complex medical and antenatal care may be influenced by the social circumstances of women. Undiagnosed and sub-optimally treated medical conditions may be a cause of maternal morbidity and mortality. The ability for women to access healthcare, including routine antenatal care to identify complications of pregnancy, adhere to medication and self-manage long-term conditions, such as epilepsy and diabetes mellitus, are all influenced by social determinants.[26] In the triennium 2015–17, *'severe and multiple disadvantage'* whereby women had three or more of the following indicators of social disadvantage: substance abuse, domestic abuse, abuse in childhood, arrival in UK within last 5 years, refugee or asylum seeker, mental health diagnosis, female genital mutilation, and known learning difficulties, was highlighted as a major concern in 6% of all deaths overall.[27] However, this has increased to 8% in the most recent MBRRACE-UK 2016-2018 report.[4] These complexities can be observed in the case histories of some of the women. For example, *'a pregnant woman who was an asylum seeker, the sole carer for other children and had hypertension and obesity booked late for antenatal care'*. Biopsychosocial complexity and service factors contributed to poor adherence to medications, irregular monitoring of her blood pressure and she died of hypertensive heart disease.[27]

3.4 Non communicable disease

Cardiac disease continues to be the leading cause of maternal mortality in the UK a rate which has remained unchanged for more than 15 years. Almost a quarter (23%) of maternal deaths were related to cardiac conditions, 16% to venous thromboembolism (VTE), with neurological conditions such as stroke or epilepsy contributing 13% of maternal deaths between 2015 and 2017.[27] From the 2020 report, there was a statistically non-significant increase in mortality rates from neurological causes with a significant increase in maternal morality due to Sudden Unexpected Death in Epilepsy (SUDEP) with a more than doubling between 2013-2015 and 2016-2018 (RR 2.33, 95% 0.96-6.19, p=0.04). Identified areas for action include ensuring that pregnant women with epilepsy are facilitated to access specialist services early in pregnancy and ideally receive pre-pregnancy counselling.[4]

Women who are older, more obese, smoke, who have family history of ischaemic heart disease or co-morbid diabetes mellitus or hypertension are at overall higher risk of cardiovascular disease and of ischaemic heart disease (the leading cardiac cause of maternal mortality).[27] In the 2015–17 triennium, the majority of women who died from a cardiac cause were over 30 years old (64%) and had previous (unspecified) pre-existing 'health problems' (62%). Of the women who died, 73% were not known to have pre-existing cardiac problems, raising concerns that opportunities to diagnose cardiac problems earlier in pregnancy were missed.[27]

Congenital, genetic or valvular heart disease were rare causes of death. For those known to have these cardiac problems, inconsistencies in pre-conceptual advice and lack of integrated obstetric / cardiac specialist perinatal care, were highlighted in the 2019 MBRRACE-UK report.[27]

3.5 Communicable disease

In the 2015–17 triennium, sepsis was the fifth most common cause of overall mortality. Death from sepsis includes genital tract and pregnancy related infections, influenza and pneumonia.[27] There was a non-statistically significant increase in deaths from sepsis compared to previous years in the 2016-18 MBRRACE report.[4] Changes in the immune system, heart and lungs during pregnancy mean that pregnant women are more prone to severe illness from influenza viral infections and this risk is further increased in the third trimester.[28] Comparing the trienniums 2011–13 to 2016–18, influenza-related deaths have reduced from 0.38 to 0.09 per 100 000 maternities and this is attributed to universal influenza vaccination of pregnant women.[4, 27]

The risks associated with COVID-19 infection in pregnancy have been highlighted during the current pandemic. SARS-CoV-2 is a new coronavirus but evidence to guide clinical care and identify risk factors is emerging. As with influenza, pregnancy-related changes in the immune response may cause severe COVID-19 symptoms, although the available evidence suggests pregnant women who develop coronavirus, are at no greater risk of becoming seriously unwell than other healthy adults, with the majority of pregnant women experiencing only mild or moderate symptoms.[29] However, avoidance of exposure to COVID-19, particularly in the third trimester is recommended. Such guidance will be much harder for women to adhere to where they live in overcrowded accommodation or are the sole carers of children. Furthermore, Black, Asian, and minority ethnic backgrounds and socioeconomic deprivation are independent risk factors for a higher risk of being infected and more severe COVID-19 infection.[30] These are also the same communities where rates of vaccine hesitancy in the UK have been reported as high, potentially increasing the risk of infection during pregnancy.[31]

The MBRRACE reports highlight the need to understand the differential burden of communicable (e.g. tuberculosis, HIV, hepatitis B) and non-communicable diseases (hypertension, heart disease, diabetes mellitus) by country of origin. Chronic heart disease related to rheumatic fever is rare in white British women, but more prevalent in low and middle income countries (LMIC), and in immigrants and older people in high income countries.[32] In a recent European prospective cohort study of pregnancy outcomes of women with rheumatic heart disease (RHD), over 75% of women were originally from LMIC countries.[33] RHD is a very rare cause of death in the UK but the MBRRACE-UK reports cited above highlight the need for vigilance and recognition of cardiac symptoms in women born outside of the UK and particularly from Africa and Asia.

3.6 Body mass index

One of the key physical determinants for a poor maternal outcome is the mother's body mass index (BMI).[34] Maternal obesity and undernutrition are strongly linked to social deprivation, with increasing disadvantage in those with a BMI of 30 kg/m^2 and greater.[35-37] Recent evidence has suggested that many women of reproductive age within the UK (and beyond) have suboptimal preconception nutrition[38–39] and it has been recommended that any interventions to improve this should take a social determinants approach.[40]

Obesity is associated with problems of early gestation, notably increased miscarriage and congenital abnormalities,[41] increased risk of VTE during and after pregnancy, insulin resistance with overgrowth of the fetus, gestational diabetes and worsening of diabetic control for women with diabetes mellitus. In addition, obesity is linked to pregnancy-induced hypertension, pre-eclampsia and complications of

interventions such as caesarean section (wound infection, VTE).[34,42] In the triennium 2003–05[43], 28% of maternal deaths were in women with a BMI greater than 30 kg/m^2, rising to more than one-third (34%) in the trienniums 2013–15[40] and 2015–17 (34%),[27] with a slight decrease in 2016-2018 to 29%.[4] Data from 2015 reported that 20% of all pregnant women in the UK had a BMI over 30 kg/m^2,[45] suggesting an increase in the mortality risk for obese pregnant women.

Links between social determinants, obesity and maternal outcomes have been reported. In a 3-year project undertaken by the Confidential Enquiry into Maternal and Child Health (CEMACH), published in 2010,[35] of those women living in England with a BMI more than 35 kg/m^2, 34% lived in the most deprived quintile of socioeconomic deprivation (by postcode) compared with 26.7% by all maternities. Black, Asian, and minority ethnic women were over-represented within this obese cohort, and more likely to have gestational diabetes and type II diabetes mellitus than white British women. This finding was supported in a large longitudinal study of English maternities. British Black and South Asian women, compared to White women, had a significantly higher incidence of obesity in the first trimester, with the highest odds observed in Pakistani women (OR 2.19, 95% CI 2.08 to 2.31, following adjustment for other population demographics).[46]

Maternal micronutrient deficiency is associated with low birthweight, fetal growth restriction (FGR) and stillbirth. Although a causal relationship between this, social determinants and maternal mortality has not been established, low maternal calcium, vitamin D and zinc all appear to be associated with pregnancy disorders such as gestational hypertension, small-for-gestational-age fetuses and preterm birth. Women originally from settings where dietary micronutrient deficiency is more common than in the UK, may be particularly at risk of this form of undernutrition.[47]

3.7 Mental health conditions

Since 2000, the overall rates of common mental disorders (CMDs) in England have steadily increased in women, compared to remaining mostly stable in men. Furthermore, CMDs were found to be more prevalent in Black women, those unemployed, and living in large households. Young women have also been identified as a particularly high-risk group for experiencing mental illness.[48]

In the 2015–17 triennium, '*severe and multiple disadvantage*' was highlighted in 6% of all deaths and included significant psychosocial challenges such as substance use, a mental health diagnosis and domestic abuse.[27] This rose to 8% in 2016-2018.[4] Of the women who died in the 2016-2018 triennium, 20% were known to social services.[4] Despite specific recommendations in previous MBRRACE-UK reports, under-reporting of a previous or pre-existing mental health problems remains a significant concern with information missing about mental health in 12% of women who died between 2016–2018.[4] Missing data on key risk factors for mental illness were also noted in relation to substance use (6%) and domestic abuse (30%), although the latter does show an improvement from the 53% in 2015-2017.[27] While the role of physical and learning disabilities are outside the scope of this paper, earlier MBBRACE-UK reports have observed that a small number of women who died, also had a disability (particularly learning disability), compounding their highly vulnerable circumstances.[40] Consequently, cross-sector collaboration with national disability organisations (amongst others) is being undertaken in an effort to find ways to reduce mortality rates for these women with multiple disadvantage and complex mental health needs further.[27]

Maternal suicide has been reclassified by WHO as a direct cause of maternal death. Since 2003, in consecutive UK maternal mortality reports, suicide rates have been static. Suicide is the leading direct cause of maternal death between 6 weeks and a year after the end of pregnancy (17%, 2016–2018).[4] Causes of suicide are complex, but in the context of pregnancy, within the period 2014–2016 the women who died by suicide mainly lived in the most deprived areas, were multiparous, had a prior

history of mental illness and/or substance misuse, experienced domestic abuse, booked late and/or received inadequate antenatal care, were already known to social services, experienced a loss (e.g. through miscarriage, termination, and neonatal or infant death) and were white British/Irish citizens.[23]

Although puerperal psychosis is rare and the association between puerperal psychosis and suicide has not been demonstrated in UK data, a systematic review identified three studies which reported 20 suicides in 220 puerperal psychosis patients.[49] These deaths often typically occur after 6 weeks post childbirth, reinforcing the importance that early recognition within primary and community health care services and access to specialist care is key to prevention of maternal and infant harm.

3.8. Smoking

Smoking during pregnancy is associated with maternal problems such as FGR, stillbirth, maternal hypertension and increased risk of venous thromboembolism.[50] Smoking during pregnancy is strongly linked to social deprivation and poor access to maternity services.[50-51] The 'Smoking Status at Time of Delivery' study for the period April 2017–March 2018, published in July 2018, showed that only 36 of 207 Clinical Commissioning Groups (CCGs) in England met the quality standard smoking rate of 6% at birth, with the UK average at 10.8%.[52] Of significant concern was the minimal impact of health promotion and access to antenatal smoking cessation support in the most deprived areas of England, with a smoking rate of almost 26% at birth in NHS Blackpool, 22.1% in East Lincolnshire and 21.9% in NHS Durham Dales, Easington and Sedgefield. This was compared with 1.6% in NHS Central London (Westminster), and 2.9% in NHS Hammersmith and Fulham, NHS Wandsworth and NHS West London.

Smoking cessation is more prevalent among women with a higher level of education and income, where a strong link between access to early antenatal care and smoking cessation support is associated with successful cessation. Women from deprived backgrounds are less likely to engage early with smoking cessation support services during pregnancy and are therefore at greater risk of the adverse outcomes.[53]

It is not known whether vaping, or e-cigarettes, during pregnancy is safe. Damaging effects on fetal growth and development have been demonstrated in animal models[54] and current UK smoking cessation guidance during pregnancy recommends the cessation of any smoking during pregnancy.[55] However, new evidence is emerging from adult smokers in general which suggests that e-cigarettes are likely to be significantly less harmful to a pregnant woman and her baby than continuing to smoke.[56] However, more research is being undertaken and is needed in this area.[57] Whether socially deprived women are more likely to vape during pregnancy is not known, however given that in the general UK population, vaping is more common in people experiencing higher levels of social deprivation,[58] potentially this pattern is also likely during pregnancy.

3.9. Alcohol misuse

The link between social determinants and substance misuse and how these factors contribute to adverse maternal outcomes is increasingly recognised, although some uncertainty still exists.

The latest MBBRACE-UK report did not differentiate between the types of substance use. However, 'Drug and alcohol/others' was a characteristic of 15% of the women who died in the 2016-2018 triennia (an increase from 12% in 2015–2017) between 6 weeks and 1 year after the end of pregnancy, in the UK.[4]

In a UK based study, over half of women in the first trimester reported alcohol intakes above the Department of Health (UK) guidelines of 2 units/week or less.[59] Furthermore, it has been found that

alcohol use during pregnancy is common[60]: almost 16% of women resident in Europe consumed alcohol during pregnancy with large cross-country variations.[61] Although most women would stop or reduce their levels of drinking when pregnancy was diagnosed, 12.5% continued to drink, even to binge levels.[61]

It is advised that women trying to conceive and those in the first three months of pregnancy should not drink alcohol.[62] Whilst dependent/heavy alcohol use in pregnancy is uncommon, the evidence suggests that this excessive level of alcohol intake poses significant risks to the woman and the baby which include acute withdrawal syndromes, congenital and birth defects as well as longer term biopsychosocial harm.[63-64]

However, there is more uncertainty around the harm from lower levels of alcohol intake and the impact upon materno-fetal outcomes. Data from a recent meta-analysis demonstrated that there is a greater risk of miscarriage (odds ratio 1.19) in women exposed to alcohol during their pregnancy, compared to those that abstain. Furthermore, this risk was dose-mediated i.e., whereby each additional weekly drink was associated with a 6% increase risk of miscarriage (based on women consuming between 0-5 alcoholic drinks per week).[65] Another meta-analysis looking at low alcohol consumption and maternofoetal outcomes concluded that with the exception of birth size and gestational age, there was insufficient data to make any further robust conclusions.[64] Therefore, it has been argued that the position for mothers to completely abstain from alcohol during pregnancy is precautionary.[64]

The links between social determinants and maternal alcohol use is unclear. Generally, though there is considerable variation in alcohol consumption by gender and socioeconomic status across Europe, with conflicting trends seen. For example, it has been consistently found that abstinence from alcohol is more likely in those with lower socio-economic status (SES). Other studies show that frequent consumption of alcohol, is more likely for those of higher SES, particularly for women. However, binge drinking and alcohol dependency are more likely in those with lower SES for both genders.[66]

Alcohol misuse generally is strongly associated with domestic abuse; commonly associated with a breakdown in family and peer support, which are key to supporting positive maternity psychosocial outcomes; and may be associated with underlying or consequent mental health problems.[67] Women with heavy evident alcohol use would need to be cared for by joint obstetric and specialist substance misuse teams to supplement medical support for alcohol withdrawal treatments and psychosocial interventions to support abstinence, and if this isn't possible safer use.[63, 66] Alcohol misuse may be a barrier to access to care for long term physical health conditions and is an independent risk factor for suicide.[68] National Institute of Health and Care Excellence (NICE) guidance[69] reinforces the need to address high population consumption through political and health promotion measures.

3.10 Illicit and prescribed drug misuse

An estimated 1% of pregnant women are problem drug users.[70] While the focus is usually on illicit use of heroin, crack cocaine, cannabis, amphetamines and a constantly changing array of 'street drugs', the growing phenomenon of dependence on prescribed opiates, especially in North America, is an example of 'hidden harm'.[70] The woman dependent on prescription synthetic opioid drugs (e.g. fentanyl) may not present as a stereotypical illicit drug user. Substance misuse among women who died in consecutive triennial reports is still implicated in maternal mortality in women with *severe and multiple disadvantage*.[4] Women who use illicit substances also commonly misuse alcohol compounding toxic effects and the risk of adverse maternal and fetal outcomes.[72]

Pregnancy may provide an opportunity for positive change for women with substance use problems with motivations, including a healthier pregnancy, and improved physical and mental health generally postpartum. Initiatives include supported detoxification and abstinence or stabilisation with carefully monitored opiate agonist therapy (usually methadone). Access to social and housing advice and support can also be offered in joint specialist obstetric and substance use clinics staffed by multidisciplinary teams. Sudden withdrawal, especially in the third trimester, may be associated with fetal distress and stillbirth, and neonatal abstinence syndrome requires joint neonatal and specialist support.[73]

3.11 Domestic abuse

The framework for thinking about the social determinants of maternal outcomes places mothers at the centre of their family, peers and social networks. It is these relationships that will often influence women's pregnancy-related behaviours and outcomes and impact on their ability to make informed and autonomous decisions, for example their freedom to make reproductive choices and ensure they have access to the services and care needed while pregnant and as a new mother.[74]

Pregnancy and the postpartum period have been identified as risk factors for domestic abuse, and there have been increased reports of intimate partner violence during the pandemic.[75] The woman's partner is typically the most frequent perpetrator of domestic abuse. Between 2009 and 2013, a total of 36 mothers were murdered and 86% were murdered by a partner or a former partner.[21] Pregnancy can be a period in a woman's life when the risk of domestic abuse is increased, in its frequency and/or intensity.[21] Women who are the victims of abuse are known to suffer a number of poor outcomes, including preterm labour, antepartum haemorrhage, stillbirth, low birthweight babies, and other undetected obstetric complications as a consequence of not being able to attend/seek care.[76] The psychological consequences of the abuse can also be substantial. The 2007 Confidential Enquiry into for Maternal and Child Health, which covered the triennium 2003–05, reported that of the 33 mothers who died from suicide between 2003 and 2005, 42% were living with domestic abuse.[43]

Most recently, of the 217 women who died from both indirect and direct causes, during or up to six weeks after pregnancy between the period 2016–2018, 19 (9%) had experienced domestic abuse either before and/or during pregnancy.[4] But as mentioned earlier, the lack of recording in women's medical notes, resulted in a high level of missing data during this period (30%), although this was less than the levels of missing data found during the previous triennium which was 53%.[27] Changes in care delivery as a result of the pandemic is a current concern for this group of women, whereby the move to virtual or telephone appointments, and reduced healthcare interactions further inhibits the opportunity for information of domestic abuse to be identified and recorded in medical notes and for women to safely disclose, receive support, and have a means to ask for obstetric or midwifery help if control extends to access to phones.[77]

The links between social inequality and domestic abuse have highlighted the vulnerable social circumstances and position of multiple disadvantage that some pregnant women find themselves in. For example, of the 42 women who had three or more indicators of social disadvantage in the 2016-2018 MBBRACE-UK report, 36 had experienced domestic abuse.[4] In the UK, during the period 2009–13, the murder rate from domestic abuse was identified as almost two and a half times higher in Black, Asian, and minority ethnic women than in white women.[21] Of the 23/36 mothers who were murdered during this same period between 6 weeks and 1 year after the end of pregnancy, the largest group (34.8%) lived in the most deprived areas, i.e. the fifth quintile measured using the Index of Multiple Deprivation (IMD). They were also younger (aged 20–24 years) and first-time mothers.[21] The aforementioned CMACE 2007 document reported similar findings of the 19 women who died from

domestic abuse, whereby, 15 were known to local social services departments, nine had previous children in care, five did not speak English, three engaged in sex work and two had been in prison.[43]

3.12 *Female genital mutilation*

Female genital mutilation (FGM) is prevalent in some of the countries of origin from which women are migrating or seeking asylum. In one report[21] some of the mothers who died had undergone FGM, although this was not considered to be a contributory factor in their death, including those who were murdered.

FGM is not carried out for therapeutic reasons but is culturally and socially determined. Women with FGM are significantly more likely than those without to have adverse obstetric outcomes, and the risk of such outcomes increases if the woman has undergone more extensive FGM.[78] Fear about their immigration status, feelings of shame related to their experiences of sexual assault and exploitation and of the perinatal interventions associated with their FGM status are also potential barriers to seeking care.[15] However, FGM may not be associated with an increased incidence of adverse obstetric and foetal morbidity or mortality when managed in high income countries such as UK.[79]

4. Institutional and structural risk factors for adverse pregnancy outcomes and their links to social determinants

4.1 Socioeconomic position

There is a strong relationship between low socioeconomic position (SEP) and poor maternal outcomes. SEP is a term that denotes how social and economic factors influence the position an individual or group holds within society.[80] Other terms used to describe this include socioeconomic status and social class, and there are debates about their appropriateness.[81] Typically, factors such as income, poverty, deprivation, wealth and education are indicators for SEP, although this may differ depending on the nature and purpose of the work, or the region and country in which SEP is being measured and analysed.[80]

To date, the CEMACH and MBRRACE-UK reports have had to rely heavily on the Indices of Multiple Deprivation (IMD) as a measure of SEP in society because data are not available at a national level to provide denominator data on any other measure of socioeconomic status. When this is used, a stark social gradient is evident with the rate of maternal mortality highest among women living in the most deprived areas. For example, during the period 2016–18, of the 217 women who died during or up to 6 weeks after pregnancy from all causes, most lived in the most deprived area (37%) compared to the least deprived area (7%).[4] The same trend was observed during the period 2015–17, whereby of the 209 women who died during or up to 6 weeks after pregnancy from all causes, 32% lived in the most deprived area compared, to 7% from the least deprived area.[27]

In terms of occupation, a similar trend has been observed over the last three trienniums where during the period 2016-2018, 65% of women were living in a household where either themselves and/or their partner were employed[4], compared to 60% in 2015–17[27], and 58% of women during 2013–15.[70] However, because the data were not available, the reports did not draw distinctions based on a woman's occupation only and there was no recording of women's levels of education. It was encouraging that the levels of missing data for occupation status had declined during the most recent triennium to 17%, from 20% during 2015-2017 and 32% during the period 2013–15.[44] However, the extent of missing data for the IMD of postcode of residence during these periods were similar at 16%, 17% and 18% respectively. It is reported that the adverse economic effects of the COVID-19 pandemic

have also disproportionately affected women, placing them at greater risk of unemployment, and reduced their access to sexual and reproductive health services, which may lead to them suffering longer term health impacts.[82]

4.2 Partners and unemployment

Previous data have suggested that pregnant women appear to be at increased risk of dying if their partner is unemployed or in an unclassified occupation.[15] For example, between 2003 and 2005 the maternal mortality rate for this group was 68.5 per 100 000 maternities, 7.4 times higher than the equivalent rate of 9.2 for all women with partners in employment. Women who were without a partner, regardless of social class, during this period were more than four times more likely to die than those with a partner in employment (maternal mortality rates of 38.6 versus 9.2 respectively).[15, 43]

4.3 Education status

Education status often coincides with SEP. Even after adjusting for key confounding factors, women with lower levels of education appear at greater risk of severe maternal outcomes. This is particularly true for women from countries that have poorer markers of social and economic development.[83] One reason may be that women with lower levels of education are more likely to find themselves in adverse social circumstances which are closely connected, e.g. low-income occupations, abusive relationships and living in more deprived areas. In addition, they may be less likely to have the health literacy to engage with or access the information and care pathways that would help optimise pregnancy outcomes, such as reproductive health information and antenatal care. In LMIC countries there is a strong association between education status and the use of maternal services.[84] It is worth noting that with the exception of Census data, few data were collected in the UK about mothers' education status in pregnancy, although it is widely used in other countries. The disruptive effects of the COVID-19 pandemic on education can be expected to contribute to future disadvantage for some women.

4.4 Ethnicity

Ethnicity is very difficult to classify. How data is collected varies and so it is difficult to unpick relationships. One of the main reasons for this is because even within the existing classifications and definitions of ethnicity, there remains significant cultural differences and different terminologies used. This is because ethnicity is socially constructed and it is this societal classification of assigning individuals to one group or another which can negatively impact upon pregnant women at many different levels, for example at a personal, institutional, and structural level.[85-86] Some of these impacts are described below but they are also described further under the sections on migration and asylum and health service factors.

From the information available, ethnicity appears to be a key social determinant of maternal mortality in many of the studies carried out globally. For example, non-Hispanic Black women in the USA die from pregnancy-related causes at a rate three to four times that of non-Hispanic white women.[87]

In the UK, between 2016 and 2018, the risk of dying in pregnancy or up to 6 weeks postpartum was significantly higher among women from Black, Asian, and mixed ethnic backgrounds compared with white women.[4] This risk was greatest for Black women being four times higher than white women (RR 4.35; 95% CI 2.77 to 6.62). Women of mixed ethnicity and women from Asian backgrounds (excluding women of Chinese and other Asian ethnicities) are also at higher risk than white women [(Mixed ethnicity RR 3.19, 95% CI 1.35.6.50) (Asian RR 1.86, 95% CI 1.19-2.830)]. There are no statistically

significant differences in the relative risk ratios between the recent triennia, suggesting that the inequality gap is neither improving nor worsening over time.[4] The observation that women from Black, Asian, and minority ethnic backgrounds compared with white women have an increased risk of maternal mortality has been consistent across many reports and across other high-income countries too.[4,88]

Reasons for these differences are unclear but research is being undertaken to explore these disparities.[27] An unmatched case-control study analysed data from women who experienced severe morbidity during the peripartum period (cases) and women who delivered immediately before the cases in the same hospital (controls) using the United Kingdom Obstetric Surveillance System (UKOSS), February 2005–January 2013. While an increased risk of severe maternal morbidity among women of ethnic minority backgrounds (Black African, Caribbean, Bangladeshi, other non-white and Pakistani women) compared with white European women was observed, this could not be explained by socioeconomic or smoking status or by BMI. Instead, the independent risk factors included anaemia in current pregnancy, having a previous pregnancy problem, experience inadequate provision of antenatal care services, pre-existing medical conditions, parity of more than three, and being younger or older.[89]

4.5 Migration and asylum

The demographics of women who give birth in the UK are changing as are the risk factors for maternal mortality. Since 1969, the percentage of live births to non-UK born mothers has more than doubled over the last 50 years from 11.7% to 28.7% and it is now at the highest level since these records began.[90]

This is important, because in the 2019 MBRRACE-UK report,[27] nearly a quarter of the women who died between 2015 and 2017 (from all causes) were born outside the UK (23%) and 42% of these women did not have UK citizenship. In the 2020 MBRRACE-UK report,[4] the figures were similar at 26% and 36% respectively although women's origin of birth had no significant association on mortality rate across both of these trienniums. Most net migration to the UK has been from citizens living outside the European Union and this has been steadily increasing since 2013.[91]

The connection between a woman's place of birth and socioeconomic factors/co-morbidities is not clear, but women seeking asylum potentially have the highest unmet physical and psychological needs. They are usually socially disconnected from peer and family support, have significant language barriers, arrive having experienced significant trauma, are usually moving around the UK into 'no choice' accommodation, that provides substandard housing away from appropriate health services, have insecure/inadequate incomes, and most importantly do not know how and from where to access help.[92] A study exploring the factors that may influence health-seeking behaviour among pregnant migrant women in England, found that poor information provision (including a lack of interpreters and culturally appropriate information), communication difficulties with healthcare staff, transport costs and lack of transport, dispersal/relocation issues, concerns about their immigration status, not seeing the service as useful or not being well enough to attend were all barriers to accessing antenatal care.[92-93] The other relevant factor is that many migrant women may fear being charged for their maternity care, or being identified, and so do not present to services.[27,94]

Some evidence also suggests that the impact of the acculturation process can result in migrant women adopting unhealthy behaviours prevalent in their new environment (particularly in relation to smoking and alcohol). These behaviours appear to worsen the longer they reside in the new country which can contribute to poorer maternal outcomes.[95]

4.6 Environmental factors

The link between social determinants and deprivation cannot be discussed without considering environmental factors and their potential impact on adverse maternal outcomes, which are increasingly recognised.[96] Although causality has not been established, there is emerging evidence of maternal adverse effects of air and noise pollution on pre-eclampsia and gestational hypertension.[97] One report reviewed 16 meta-analyses of environmental pollutants that adversely affects pregnancy outcomes. They noted that although studies were of low methodological quality, the meta-analyses suggested statistically significant associations between: 1) environmental tobacco smoke (ETS) and stillbirth, birth weight and congenital anomalies, 2) maternal exposure to particulate matter with aerodynamic diameter between 2.5 and 10 μm and preterm birth, outdoor air pollution and some congenital anomalies, 3) indoor air pollution from solid fuel use and stillbirth and birth weight, 4) exposure to polychlorinated biphenyls and birth weight, 5) disinfection by-products in water and stillbirth, small-for-gestational age (SGA) and possibly some congenital anomalies, 6) occupational exposure to pesticides and solvents and some congenital anomalies, and agent orange and some congenital anomalies.[98]

4.7 Health service factors

NICE recommends that ideally pregnant women should access antenatal care by 10^{+0} weeks of gestation.[99] Delayed access to antenatal care, referred to as 'late booking' in the UK, is linked to worse maternal outcomes. In addition to missing routine antenatal checks and tests of maternal and fetal wellbeing, women may not receive timely antenatal information (e.g. around lifestyle advice, folic acid supplementation and screening tests) and preventative interventions such as influenza vaccination. Between 2016 and 2018, of the women who died who received any antenatal care (n = 187); 61% of these did not receive the recommended level of care i.e. booked at 10 weeks or less, with no routine antenatal visits missed).[4] This figure was similar to that observed in the triennium 2015–17 (63%).[27]

There is a strong link between social determinants and delayed access to care.[100] Key characteristics identified for poor or non-attendance include higher parity and immigrant status.[101] A review of experiences of disadvantaged women in the UK maternity system found that, amongst other factors, access was impacted by availability of interpreters, education, practical support and lack of continuity of care models.[102] Other studies[103–107] from in and outside the UK have found that common characteristics of 'late bookers' to antenatal care are ethnicity, young age, low income, low educational and support levels, asylum seekers and substance misuse – all affecting women with severe and multiple disadvantage.[107] Learning disability also appears to have played a role for a small number of women who had undertook infrequent and intermittent access to pregnancy care services.[44] The barriers to antenatal care attendance that women on low incomes, who are often from the poorest community's face has also led for 'poverty proofing' and identifying ways to remove some of the hidden costs associated with pregnancy.[108]

A qualitative study[109] proposed a novel taxonomy to describe the reasons for late or non-booking of antenatal care. The key factors were: medical and system errors within the NHS (e.g. failure to send appointment letters), women simply 'not knowing they were pregnant (e.g. because of experiencing no traditional pregnancy symptoms)' or 'knowing they were pregnant but having decided to postpone attendance' (e.g. because of the perceived lack of value of antenatal care). Furthermore, a lack of reproductive health knowledge was a cross-cutting theme, which compounded other barriers to timely access to care. Some of these themes have been observed when exploring reasons for non-attendance of antenatal care services in LMIC too – particularly the failure for antenatal care services to be delivered in a way which recognises the socio-economic and cultural contexts in which pregnancy and birth are perceived and experienced.[110]

Access to postnatal care is also affected by the same social determinants. The Marmot review in 2010 highlighted the importance of integrated antenatal and postnatal policies, with access to high quality parenting programs, early childhood education and childcare to ensure every child is given the best start in life.[1] An updated look at these recommendations in 2020 by the same group found persistent inequalities in the UK in giving every child the best start, noting increased rates of child poverty since the original report.[111]

Finally, access to antenatal and postnatal care cannot be considered without consideration of the environment within which pregnant women have to engage. Recent reports raise concerns about systematic problems within maternity services which may account for the racial and ethnic disparities observed.[86, 112-117] For example because of institutional racism, and because mothers from ethnic minority groups are more likely to experience and report discrimination and bias in their care and report distrust of medical professionals, they are prevented from being able to access timely healthcare.[118-119]

4.8 Governance and law

According to the Human Rights Act 1998, the right to liberty and security, with freedom from torture, cruel, inhumane or degrading treatment is a fundamental human right.[120] Abuse of such rights can happen from gender-based violence, FGM, forced marriage, domestic abuse and sexual violence. This disproportionately affects women from minority ethnic groups and has direct links to poor pregnancy outcomes including maternal deaths.[121] A report by Birthrights and Birth Companions in 2019 relating to women with severe and multiple disadvantage identified potential to breach these women's rights to safe and appropriate maternity care, respectful and dignified treatment, autonomy, choice and consent, respect for private and family life and equality, all of which relate to Articles 2 and 3 of the European Convention on Human Rights (right to life and prohibition on inhumane or degrading treatment), Article 8 (private and family life) and Article 14 (non-discrimination).[107]

Global and UK government prioritisation of women's health has a major impact on maternal mortality. The Female Genital Mutilation Act of 2003, as amended by the serious crime act of 2015, has made this practice illegal in the UK. Anyone found guilty of an offence under this Act faces a maximum penalty of up to 14 years in jail. The widespread implementation of the law, coupled with aggressive advocacy, guidance development, and public enlightenment on a global scale have contributed to the sharp decline in this practice in many countries of the world.[122]

Globally, unsafe abortion is estimated to account for 48 000 maternal deaths each year. There is evidence that maternal deaths dramatically reduced following the legalisation of abortion in the UK Abortion Act 1967, coupled with the provision of readily accessible and safe abortion services.[123] This is supported by global data[124] showing maternal death rates rise with restriction of access to safe abortion services, and conversely, death rates fall dramatically when safe abortion services are available.

5. Opinion

The complex causal pathways linking social inequalities and maternal mortality are extremely difficult to disentangle with the current levels of evidence available. Whilst members of the obstetric and midwifery multidisciplinary team may have limited power to modify social determinants of health, awareness of these impacts is important so that at-risk groups can be identified and have access to care as early as possible.

A number of reports have been produced that provide recommendations to improve maternal outcomes, focussing on service delivery, policy changes and potential areas of research that particularly reflect the needs of women facing multiple disadvantage. These focus specifically on the UK context as the interventions/policy recommendations may be different in the global context.

- **General care of pregnant women.**
  - Sharing of records between healthcare providers (e.g. between primary, secondary and social care), especially if they contain useful background information (e.g. history of self-harm, domestic abuse, children in care).[21, 107]
  - Extra vigilance by general practitioners, midwives, obstetricians and gynaecologists regarding recent migrants who may enter the country with pre-existing medical conditions that are prevalent in their country of origin, but rare in the UK.[125]
  - Policymakers should provide national guidance for the care of women with multiple physical and mental health morbidities and social factors prior to, during and after pregnancy.[21, 107]
  - Development of care pathways, that include out-reach work and centre around the provision of continuity of care, to better support access and engagement with antenatal and postnatal care for women with multiple disadvantage (e.g. for women whose infants are at risk of removal by social care[107] and/or where dispersal and relocation policies, or accessibility of virtual appointments may prevent/hinder access to timely antenatal and postnatal care).[126,92]
  - Development of care pathways that provide easy access to long-acting contraception to reduce unwanted pregnancies and pregnancy terminations.
- **Improving the collection and reporting of maternal outcome data.**
  - Developing training packages to provide better support for midwives, obstetricians and gynaecologists to take a structured psychosocial history, beyond the physical and medical individual characteristics presented by the pregnant woman.
  - Improving the recording of social determinants to help understand their contribution to overall maternal mortality.[107] It has recently been proposed that the distinction between direct and indirect causes is counterproductive, given that the goal of obstetric care should be on reducing all preventable deaths.[127] Taking a social determinant perspective would support this argument as health inequalities play an important role in maternal deaths in both causes. An additional problem lies in the classification of causes and the extent to which a death is traced back to an initial morbid event i.e. the causes of the causes.[94] Consequently, to better facilitate the identification of risk factors and achieve uniformity in data collection nationally and internationally, improving the way that maternal deaths are classified and recorded is warranted.
- **Investment in preventative and intervention measures.**
  - Research investment by research councils/NIHR into preventative measures that can provide women with improved education/information about sexual reproductive health, preconception, antenatal, intrapartum and postnatal care.[128]
  - Investment by research councils/NIHR in establishing interventions that seek to improve the quality of, and access to, sexual reproductive health (e.g. contraception), preconception, antenatal, intrapartum and postnatal care[21] (aimed at mothers, families and peer groups, including women with pre-existing medical problems and migrant women).[129] For example, improving access via new technology and working with hard to reach groups of pregnant women to deliver care in novel ways.[128]
  - Research investment to explore health care professional and health services role in enabling access to antenatal care for women from all backgrounds, for example cultural sensitivity and cultural congruent care (e.g. the role of unconscious/conscious bias).[86]

Further to these recommendations, the following should be considered to improve future assessment, management and clinical outcomes of these women:

- A holistic multidisciplinary approach to the care of pregnant women by midwives, obstetricians and gynaecologists taking into account women's preconception and social circumstances including enhanced educational programmes at adolescent age to highlight risks to maternal and offspring health outcomes of adverse social determinants.[92]
- Collecting detailed social determinant data for all pregnant women as part of routine data collection that do not require data linkage, i.e. it will be readily available for things such as the investigation of mortality and morbidity. Recent reports and infographics are based upon insufficient social determinant data and therefore the information presented is not adequate to illustrate the highly complex relationships between social determinants and maternal mortality.[4]
- Formal systematic reviews are needed in this area, particularly in the UK context. Arising from our work on this SIP, the team are currently undertaking such a review to synthesise the literature in this area further.
- Developing new tools (e.g. questionnaires and screening systems) that are efficient and simple to use (i.e. allowing integration into electronic patient records) to facilitate the collection of more detailed data on social determinants as part of routine clinical practice and to inform MBBRACE-UK reports.
- Agreeing appropriate terminology and definitions for the collection of certain types of social determinant data (e.g. maternal death from domestic abuse, and disability). Current information systems cannot handle these types of data accurately.[129-130] It is important to note that whilst we have used the word 'disability' this is based on how it has been classified in previous reports. Disability rights advocates and campaigners are urging a move towards the social model of disability, i.e. a person may have 'impairments', such as mobility issues or a chronic mental health condition but it is not these which disable them; rather it is societal attitudes or physical obstacles which act as barriers to participation/inclusion/better outcomes. Whilst using such terminology to record and discuss disability has been agreed and utilised by the Welsh Government in its strategy/policy documents, adhering to this social model of disability more widely is particularly recommended.[131]

In summary, adverse social determinants of health affect maternal clinical outcomes, leading to an increased risk of maternal mortality and morbidity. Although the numbers of pregnant women who die in the UK are low, identifying and mitigating the multiple factors that contribute to the web of disadvantage will improve birth outcomes and reduce maternal morbidity as well as mortality. In doing so, however, it is important that disadvantaged women are not stigmatised and subjected to excessive and unwarranted interventions. Identifying and chronicling women's psycho-social history is essential to drive improvements in health outcomes, i.e. taking a life course approach to the assessment of the pregnant woman. The recent experiences during the coronavirus pandemic that highlights emerging links to increased adverse outcomes in Black, Asian, and minority ethnic groups and those with an increased BMI illustrate that if we are to improve our understanding and care for diseases and conditions related to pregnancy, we will need to develop interventions that address adverse social determinants of health as well as manage the conditions themselves in order to improve maternal outcomes for all pregnant women – especially those at most disadvantage.

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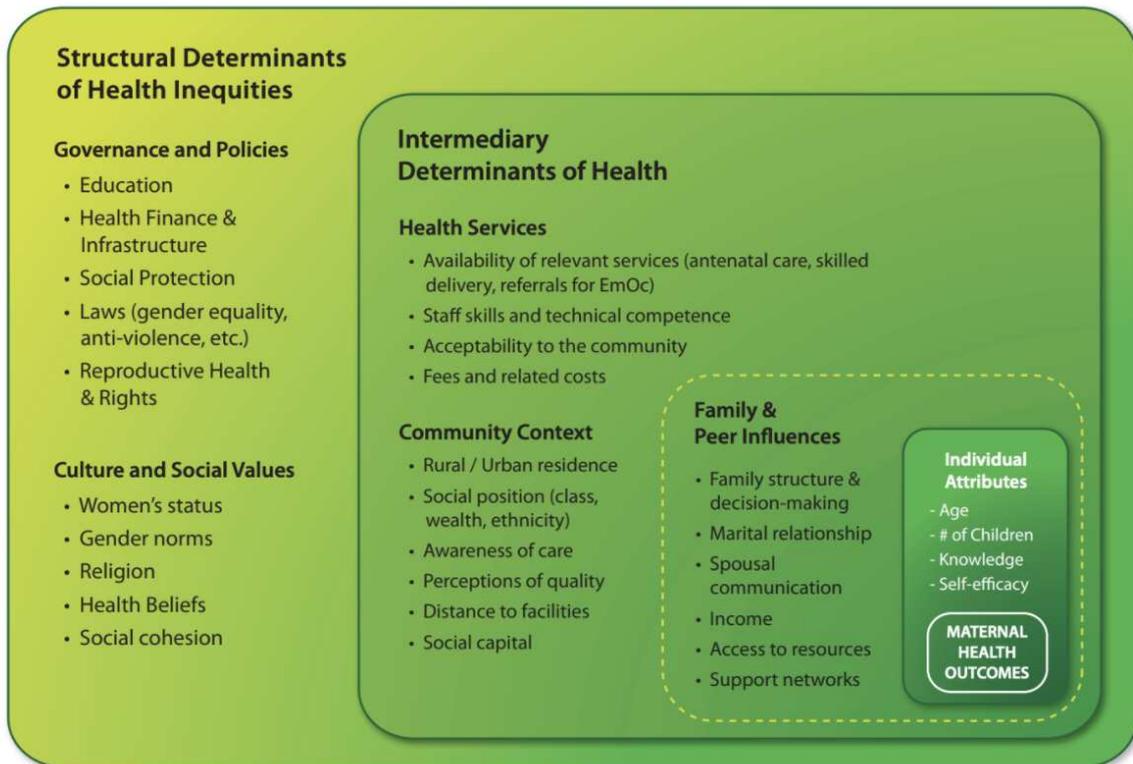
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Appendix I: The social determinants of maternal health as cited by the United Nations Development Programme in their Discussion Paper. A Social Determinants Approach to Maternal Health.[12] This figure was adapted from the WHO (2011) Closing the Gap: Policy into Practice on Social Determinants of Health. Geneva: WHO: Page 7.[11]

Structural Determinants of Health Inequities

Governance and Policies

- Education
- Health Finance & Infrastructure
- Social Protection
- Laws (gender equality, anti-violence, etc.)
- Reproductive Health & Rights

Culture and Social Values

- Women's status
- Gender norms
- Religion
- Health Beliefs
- Social cohesion

Intermediary Determinants of Health

Health Services

- Availability of relevant services (antenatal care, skilled delivery, referrals for EmOc)
- Staff skills and technical competence
- Acceptability to the community
- Fees and related costs

Community Context

- Rural / Urban residence
- Social position (class, wealth, ethnicity)
- Awareness of care
- Perceptions of quality
- Distance to facilities
- Social capital

Family & Peer Influences

- Family structure & decision-making
- Marital relationship
- Spousal communication
- Income
- Access to resources
- Support networks

Individual Attributes

- Age
- # of Children
- Knowledge
- Self-efficacy

MATERNAL HEALTH OUTCOMES

The paper will be considered for update 3 years after publication, with an intermediate assessment of the need to update 2 years after publication.